

UTILITY PATENT APPLICATION TRANSMITTAL <i>(Only for new nonprovisional applications under 37 CFR 1.53(b))</i>	Attorney Docket No.	0520-51700CX1CON
	First Named Inventor	Kouichi ANNO
	Title	DISPLAY DEVICE
	Express Mail Label No.	

APPLICATION ELEMENTS <i>See MPEP chapter 600 concerning utility patent application contents.</i>	Commissioner for Patents P.O. Box 1450 Alexandria, VA 22313-1450
1. ☐ Fee Transmittal Form (PTO/SB/17 or equivalent) 2. ☐ Applicant asserts small entity status. See 37 CFR 1.27 3. ☐ Applicant certifies micro entity status. See 37 CFR 1.29. Applicant must attach form PTO/SB/15A or B or equivalent. 4. ☒ Specification [Total Pages <u>38</u>] Both the claims and abstract must start on a new page. (See MPEP § 608.01(a) for information on the preferred arrangement) 5. ☒ Drawing(s) (35 U.S.C. 113) [Total Sheets <u>8</u>] 6. ☒ Inventor's Oath or Declaration [Total Pages _____] (including substitute statements under 37 CFR 1.64 and assignments serving as an oath or declaration under 37 CFR 1.63(e)) a. ☐ Newly executed (original or copy) b. ☒ A copy from a prior application (37 CFR 1.63(d)) 7. ☒ Application Data Sheet * See note below. See 37 CFR 1.76 (PTO/AIA/14 or equivalent) 8. CD-ROM or CD-R in duplicate, large table, or Computer Program (Appendix) ☐ Landscape Table on CD 9. Nucleotide and/or Amino Acid Sequence Submission (if applicable, items a. – c. are required) a. ☐ Computer Readable Form (CRF) b. ☐ Specification Sequence Listing on: i. ☐ CD-ROM or CD-R (2 copies); or ii. ☐ Paper c. ☐ Statements verifying identity of above copies	ACCOMPANYING APPLICATION PAPERS 10. ☐ Assignment Papers (cover sheet & document(s)) Name of Assignee _____ 11. ☒ 37 CFR 3.73(c) Statement ☒ Power of Attorney (when there is an assignee) 12. ☐ English Translation Document (if applicable) 13. ☒ Information Disclosure Statement (PTO/SB/08 or PTO-1449) ☐ Copies of citations attached 14. ☒ Preliminary Amendment 15. ☐ Return Receipt Postcard (MPEP § 503) (Should be specifically itemized) 16. ☐ Certified Copy of Priority Document(s) (if foreign priority is claimed) 17. ☐ Nonpublication Request Under 35 U.S.C. 122(b)(2)(B)(i). Applicant must attach form PTO/SB/35 or equivalent. 18. ☐ Other: _____ _____ _____ _____

***Note:** (1) Benefit claims under 37 CFR 1.78 and foreign priority claims under 1.55 **must** be included in an Application Data Sheet (ADS).
(2) For applications filed under 35 U.S.C. 111, the application must contain an ADS specifying the applicant if the applicant is an assignee, person to whom the inventor is under an obligation to assign, or person who otherwise shows sufficient proprietary interest in the matter. See 37 CFR 1.46(b).

19. CORRESPONDENCE ADDRESS					
☒ The address associated with Customer Number: <u>133303</u> OR ☐ Correspondence address below					
Name					
Address					
City		State		Zip Code	
Country		Telephone		Email	
Signature			Date		2016-01-25
Name (Print/Type)			Registration No. (Attorney/Agent)		70156

This collection of information is required by 37 CFR 1.53(b). The information is required to obtain or retain a benefit by the public which is to file (and by the USPTO to process) an application. Confidentiality is governed by 35 U.S.C. 122 and 37 CFR 1.11 and 1.14. This collection is estimated to take 12 minutes to complete, including gathering, preparing, and submitting the completed application form to the USPTO. Time will vary depending upon the individual case. Any comments on the amount of time you require to complete this form and/or suggestions for reducing this burden, should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, U.S. Department of Commerce, P.O. Box 1450, Alexandria, VA 22313-1450. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. **SEND TO: Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450.**

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

Privacy Act Statement

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

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

1. The information on this form will be treated confidentially to the extent allowed under the Freedom of Information Act (5 U.S.C. 552) and the Privacy Act (5 U.S.C. 552a). Records from this system of records may be disclosed to the Department of Justice to determine whether disclosure of these records is required by the Freedom of Information Act.
2. A record from this system of records may be disclosed, as a routine use, in the course of presenting evidence to a court, magistrate, or administrative tribunal, including disclosures to opposing counsel in the course of settlement negotiations.
3. A record in this system of records may be disclosed, as a routine use, to a Member of Congress submitting a request involving an individual, to whom the record pertains, when the individual has requested assistance from the Member with respect to the subject matter of the record.
4. A record in this system of records may be disclosed, as a routine use, to a contractor of the Agency having need for the information in order to perform a contract. Recipients of information shall be required to comply with the requirements of the Privacy Act of 1974, as amended, pursuant to 5 U.S.C. 552a(m).
5. A record related to an International Application filed under the Patent Cooperation Treaty in this system of records may be disclosed, as a routine use, to the International Bureau of the World Intellectual Property Organization, pursuant to the Patent Cooperation Treaty.
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 Patent Application Fee Transmittal				
Application Number:				
Filing Date:				
Title of Invention:		DISPLAY DEVICE		
First Named Inventor/Applicant Name:		Kouichi ANNO		
Filer:		Arimi Yamada		
Attorney Docket Number:		0520-51700CX1CON		
Filed as Large Entity				
Filing Fees for Utility under 35 USC 111(a)				
Description	Fee Code	Quantity	Amount	Sub-Total in USD(\$)
Basic Filing:				
Utility application filing	1011	1	280	280
Utility Search Fee	1111	1	600	600
Utility Examination Fee	1311	1	720	720
Pages:				
Claims:				
Miscellaneous-Filing:				
Petition:				
Patent-Appeals-and-Interference:				

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

Electronic Acknowledgement Receipt

EFS ID:	24717416
Application Number:	15005737
International Application Number:	
Confirmation Number:	7062
Title of Invention:	DISPLAY DEVICE
First Named Inventor/Applicant Name:	Kouichi ANNO
Customer Number:	133303
Filer:	Arimi Yamada
Filer Authorized By:	
Attorney Docket Number:	0520-51700CX1CON
Receipt Date:	25-JAN-2016
Filing Date:	
Time Stamp:	17:48:39
Application Type:	Utility under 35 USC 111(a)

Payment information:

Submitted with Payment	yes
Payment Type	Credit Card
Payment was successfully received in RAM	\$ 1600
RAM confirmation Number	8098
Deposit Account	506785
Authorized User	YAMADA, ARIMI
The Director of the USPTO is hereby authorized to charge indicated fees and credit any overpayment as follows: Charge any Additional Fees required under 37 CFR 1.16 (National application filing, search, and examination fees) Charge any Additional Fees required under 37 CFR 1.17 (Patent application and reexamination processing fees)	

Charge any Additional Fees required under 37 CFR 1.19 (Document supply fees)					
Charge any Additional Fees required under 37 CFR 1.20 (Post Issuance fees)					
Charge any Additional Fees required under 37 CFR 1.21 (Miscellaneous fees and charges)					
File Listing:					
Document Number	Document Description	File Name	File Size(Bytes)/ Message Digest	Multi Part /.zip	Pages (if appl.)
1	Application Data Sheet	0520-51700CX1CON_ADS_cu.pdf	117662 98d88d72e755d6571b5274241642168e30edb10d	no	9
Warnings:					
Information:					
This is not an USPTO supplied ADS fillable form					
2		0520-51700CX1CON_Specification_Claims_Abstract.pdf	1455504 82c80edfc4bde7ea5d50e68a22a1443bbb8f343c	yes	38
	Multipart Description/PDF files in .zip description				
	Document Description		Start	End	
	Specification		1	32	
	Claims		33	37	
	Abstract		38	38	
Warnings:					
Information:					
3	Drawings-only black and white line drawings	0520-51700CX1CON_Drawing.pdf	138000 a79d6fe4bd1d7bca3b3bd94bdf498788043fda81	no	8
Warnings:					
Information:					
4	Preliminary Amendment	0520-51700CX1CON_PreliminaryAmendment.pdf	28825 c9c22792929f945e51eb8029c01289b170036a5a	no	3
Warnings:					
Information:					
5	Information Disclosure Statement (IDS) Form (SB08)	0520-51700CX1CON_IDS_cu.pdf	84384 54cfcd923582760d7075a5795e55772ddbb1394a	no	6
Warnings:					
Information:					
This is not an USPTO supplied IDS fillable form					

6	Transmittal Letter	0520-51700CX1CON_IDS_Transmittal.pdf	20508 89e2228e474a17d85d02061026dcc13dbd6483	no	2
Warnings:					
Information:					
7	Assignee showing of ownership per 37 CFR 3.73	0520-51700CX1CON_373c_JDI.pdf	121821 a0f64065cc022d6ef5ffa1056401bed4920f8432	no	3
Warnings:					
Information:					
8	Assignee showing of ownership per 37 CFR 3.73	0520-51700CX1CON_373c_Panasonic.pdf	119610 549f28c86f6b9ff749ea2707cac5e9c8d9738218	no	3
Warnings:					
Information:					
9	Power of Attorney	20160106_POA.pdf	32742 5795d14efaf6e0ec7a5de35ceff3e86c3324d314	no	1
Warnings:					
Information:					
10	Oath or Declaration filed	0520-51700CX1CON_OathDec.pdf	445730 f281d491321d35b2678a9a77393d5f93653a7ab7	no	6
Warnings:					
Information:					
11	Transmittal of New Application	0520-51700CX1CON_Transmittal.pdf	276906 95e602501e598d1f62be03f5f36c7ad778d23dd9	no	2
Warnings:					
Information:					
12	Fee Worksheet (SB06)	fee-info.pdf	34733 afb96be16cc9e18dac114432d0df195c268e7024	no	2
Warnings:					
Information:					
Total Files Size (in bytes):			2876425		

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.

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	0520-51700CX1CON
		Application Number	
Title of Invention	DISPLAY DEVICE		
<p>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.</p> <p>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.</p>			

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	
	Kouichi		ANNO		
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	105-0003	Country ⁱ	JP		
Inventor 2					Remove
Legal Name					
Prefix	Given Name	Middle Name	Family Name	Suffix	
	Takumi		SATO		
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	105-0003	Country ⁱ	JP		
Inventor 3					Remove
Legal Name					

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	0520-51700CX1CON
		Application Number	
Title of Invention	DISPLAY DEVICE		

Prefix	Given Name	Middle Name	Family Name	Suffix
	Masahiro		TERAMOTO	
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	105-0003	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	133303		
Email Address	typha_japan@typhaip.com	Add Email	Remove Email

Application Information:

Title of the Invention	DISPLAY DEVICE		
Attorney Docket Number	0520-51700CX1CON	Small Entity Status Claimed	☐
Application Type	Nonprovisional		
Subject Matter	Utility		
Total Number of Drawing Sheets (if any)	8	Suggested Figure for Publication (if any)	

Filing By Reference:

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

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

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

Application Data Sheet 37 CFR 1.76		Attorney Docket Number	0520-51700CX1CON
		Application Number	
Title of Invention	DISPLAY DEVICE		

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	133303		

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	14254926	2014-04-17		
Prior Application Status	Patented	Remove			
Application Number	Continuity Type	Prior Application Number	Filing Date (YYYY-MM-DD)	Patent Number	Issue Date (YYYY-MM-DD)
14254926	Continuation of	13151362	2011-06-02	8704762	2014-04-22
Additional Domestic Benefit/National Stage Data may be generated within this form by selecting the Add button.					

Foreign Priority Information:

Application Data Sheet 37 CFR 1.76		Attorney Docket Number	0520-51700CX1CON
		Application Number	
Title of Invention	DISPLAY DEVICE		

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)¹ 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).

Application Number	Country ^j	Filing Date (YYYY-MM-DD)	Access Code ^l (if applicable)
2010-126877	JP	2010-06-02	

Additional Foreign Priority Data may be generated within this form by selecting the **Add** button.

Statement under 37 CFR 1.55 or 1.78 for AIA (First Inventor to File) Transition Applications

☐ This application (1) claims priority to or the benefit of an application filed before March 16, 2013 and (2) also contains, or contained at any time, a claim to a claimed invention that has an effective filing date on or after March 16, 2013.

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

Application Data Sheet 37 CFR 1.76		Attorney Docket Number	0520-51700CX1CON
		Application Number	
Title of Invention	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.

Application Data Sheet 37 CFR 1.76		Attorney Docket Number	0520-51700CX1CON
		Application Number	
Title of Invention	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			
<p>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.</p>			
<input type="button" value="Clear"/>			
☒ Assignee		☐ Legal Representative under 35 U.S.C. 117	
☐ 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: <input type="text"/>			
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	105-0003
Phone Number		Fax Number	
Email Address			
Additional Applicant Data may be generated within this form by selecting the Add button.			

Application Data Sheet 37 CFR 1.76		Attorney Docket Number	0520-51700CX1CON
		Application Number	
Title of Invention	DISPLAY DEVICE		

Applicant 2			
<p>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.</p>			
<input type="button" value="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:			
<div style="border: 1px solid black; height: 20px;"></div>			
Name of the Deceased or Legally Incapacitated Inventor: <div style="border: 1px solid black; width: 400px; height: 20px;"></div>			
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, Himeji-shi		
Address 2			
City	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.			

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
<p>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.</p>
If the Assignee or Non-Applicant Assignee is an Organization check here. ☐

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	0520-51700CX1CON
		Application Number	
Title of Invention	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		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.

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	/Arimi Yamada/		Date (YYYY-MM-DD)	2016-01-25	
First Name	Arimi	Last Name	Yamada	Registration Number	70156

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

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

Privacy Act Statement

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

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

1. The information on this form will be treated confidentially to the extent allowed under the Freedom of Information Act (5 U.S.C. 552) and the Privacy Act (5 U.S.C. 552a). Records from this system of records may be disclosed to the Department of Justice to determine whether the Freedom of Information Act requires disclosure of these records.
2. A record from this system of records may be disclosed, as a routine use, in the course of presenting evidence to a court, magistrate, or administrative tribunal, including disclosures to opposing counsel in the course of settlement negotiations.
3. A record in this system of records may be disclosed, as a routine use, to a Member of Congress submitting a request involving an individual, to whom the record pertains, when the individual has requested assistance from the Member with respect to the subject matter of the record.
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.

TITLE OF THE INVENTION

DISPLAY DEVICE

CROSS REFERENCE TO RELATED APPLICATION

5 This application is a continuation of US Application Serial No. 13/151,362, filed June 2, 2011, the contents of which are incorporated herein by reference.

CLAIM OF PRIORITY

10 The present application claims priority from Japanese Patent Application JP 2010-126877 filed on June 2, 2010, the content of which is hereby incorporated by reference into this application.

BACKGROUND OF THE INVENTION

15 1. Field of the Invention

 The present invention relates to a display device. The invention particularly relates to a technique of facilitating the inspection for signal interconnects formed in the region outside detection and display areas for the display device.

20 2. Description of the Prior Art

 A liquid crystal display panel is configured such that a first substrate is opposed to second substrate by way of a liquid crystal layer, in which the first substrate (TFT substrate) is formed with thin film transistors, pixel electrodes, etc. and the second substrate (color filter substrate) is formed with color filters,
25 etc. The liquid crystal display panel having such a structure is manufactured as

follows. The first substrate (TFT substrate), which contains circuit patterns for the liquid crystal display devices by a plurality number of sheets, is bonded to the second substrate (color filter substrate) including color filters, etc., where liquid crystals are sealed between the substrates. The thus-formed glass
5 substrate is then cut on every liquid crystal display device. If chipping or crack is formed at the end of the glass substrate at the cutting step or during handling of the glass substrate, a problem with interconnect defect arises in which signal interconnects formed over the substrate are disconnected at the same time with occurrence of substrate chipping or cracking.

10 In a display device mounted on a mobile information terminal, a coordinate input device referred to as a touch panel is attached to the liquid crystal display panel on the side of the display surface and so image display is generally controlled based on the information provided by the display image and the contact position. The touch panel has such a structure that electrodes are
15 formed in a detection region over a glass substrate and signal interconnects for supplying driving signals to the electrodes are formed at the periphery of the detection region. Accordingly, a problem with interconnect defect arises in which the signal interconnects are disconnected at the same time with occurrence of substrate chipping or cracking as is the case with the liquid crystal
20 display panel.

JP-A-2002-350896, for example, discloses a liquid crystal display device as a method of detecting such interconnect defect. The liquid crystal display device described in JP-A-2002-350896 is configured as follows. Common interconnects arranged in parallel are connected to each other at the
25 peripheral edge portion of the display screen and the display screen is formed

with an opening at a central portion thereof, thereby enabling detection of disconnection of the common interconnects using an array technique.

Further, JP-A-1997-80478 discloses a technique of detecting short-circuit of drain lines by using a provisional interconnect formed in parallel with gate lines. Further, JP-A-1995-152043 discloses a technique of forming a liquid crystal display device pattern by a plurality number of sheets per one glass substrate. In such a technique, when the glass substrate is divided into liquid crystal display devices at a cutting step, common interconnects for connecting interconnects to each other are provided for regions where the liquid crystal display devices are separated.

SUMMARY OF THE INVENTION

Since the touch panel is attached to the liquid crystal display panel on the side of the display surface and adapted to detect an operator's input instruction, a light shielding film is disposed at the periphery of a detection region so as to cover the region in which the interconnect region, etc. are formed. If the touch panel is attached to the liquid crystal display panel on the side of the display, therefore, the interconnect region is located between the light shielding film and the liquid crystal display panel. This makes it extremely difficult to perform visual inspection for disconnection of signal interconnects attributable to substrate chipping or cracking. Therefore, it is difficult to discover, until the final inspection that requires much time for inspection, disconnection of signal interconnects which possibly occur after bonding of the liquid crystal display panel to the touch panel. What is needed is a simple inspection method.

On the other hand, since the method described in JP-A-2002-350896 requires inspection on every signal interconnect, it may take extremely much time as is the case with the final inspection. In contrast, none of JP-A-1997-80478 and JP-A-1995-152043 includes a description about the inspection of
5 signal interconnects.

The present invention has been made in view of the problems described above, and the object of the invention is to provide a technique that can simply determine pass/failure of signal interconnects for chipping or cracking of a substrate without increase in the number of manufacturing steps.

10 (1) To solve the problems described above, the present invention provides a display device comprising:

a coordinate input device including

a transparent substrate having detection electrodes disposed in a detection region corresponding to a contact position, the transparent substrate
15 having a first signal interconnect disposed in a region outside the detection region, the first signal interconnect having one end connected to the detection electrodes and being formed with a first electrode terminal at the other end thereof, and

a flexible interconnect substrate connected to the first electrode
20 terminal, the flexible interconnect substrate used for supplying a driving signal to the detection electrodes by way of the first signal interconnect and extracting a detection signal from the detection electrodes; and

a display panel for image display based on a video signal from an external system, the coordinate input device being disposed on the display
25 panel at the side of a display screen;

wherein the coordinate inputting device has a second signal interconnect disposed outside the first signal interconnect but near the peripheral edge of the transparent substrate, the second signal interconnect surrounding the area where the detection region is included and the first signal interconnect is formed, the second signal interconnect being opened at opposite ends thereof and being connected to respective electrode terminals for inspection at the open ends, and

wherein the second signal interconnect is formed of a thin conductive film disposed along the peripheral edge portion of the transparent substrate.

(2) To solve the problems described above, the present invention further provides a display device comprising:

a first substrate formed with

- a plurality of video signal lines,
- a plurality of scanning signal lines intersecting the video signal lines,
- electrode terminals receiving a driving signal and a control signal from the video signal lines, the scanning signal lines, and an external system, and
- a third signal interconnect connecting the video signal lines and the scanning signal lines with the electrode terminals; and
- a flexible interconnect substrate connected to the first substrate, the flexible interconnect substrate used for supplying the driving signal to the video signal lines and the scanning signal lines by way of the electrode terminals and the third signal interconnect;

a region surrounded by the video signal lines and the scanning signal lines being a pixel area;

a region where the pixels are formed in a matrix being a display area;

the third signal interconnect being formed in a region outside the display area; and

a fourth signal interconnect disposed outside the third signal interconnect but near the peripheral edge of the transparent substrate, the fourth signal interconnect surrounding the area where the display area is included and the third signal interconnect is formed, the fourth signal interconnect being opened at opposite ends thereof and being connected to respective electrode terminals for inspection at the open ends;

wherein the fourth signal interconnect is formed of a conductive thin film disposed along the peripheral edge portion of the transparent substrate.

According to the present invention, pass/failure of signal interconnects for substrate chipping or cracking can simply be examined without increase in the number of manufacturing steps.

Other effects of the invention will become apparent with reference to the entire description in the specification.

Brief Description of the Drawings

Fig. 1 is a cross sectional view for explaining the entire constitution of a liquid crystal display device as a display device according to Embodiment 1 of the invention;

Fig. 2 is a diagram for explaining the schematic constitution of the liquid crystal display panel of Embodiment 1;

Fig. 3 is a diagram for explaining the schematic constitution of a touch panel according to Embodiment 1;

Fig. 4 is a view in which chipping occurs in a third substrate of a touch panel in the liquid crystal display device of Embodiment 1 shown in Fig. 3;

5 Fig. 5 is a diagram for explaining a schematic constitution of a touch panel in a display device according to Embodiment 2 of the invention;

Fig. 6 is a diagram for explaining a schematic constitution of a touch panel in a display device according to Embodiment 3 of the invention;

10 Fig. 7 is a diagram for explaining a schematic constitution of a touch panel in a display device according to Embodiment 4 of the invention;

Fig. 8 is a diagram for explaining a schematic constitution of a flexible printed substrate in a touch panel of Embodiment 1; and

15 Fig. 9 is a diagram for explaining a schematic constitution of a liquid crystal display panel as a display device according to Embodiment 5 of the invention.

Description of Preferred Embodiments

Preferred embodiments of the present invention will be described with reference to the drawings. In the following explanation, identical constituent
20 elements carry the same references for which duplicate descriptions are to be omitted.

(Embodiment 1)

(Entire constitution)

25 Fig. 1 is a cross sectional view for explaining the entire constitution of a liquid crystal display device as a display device according to Embodiment 1 of

the invention, and the display device of the Embodiment 1 will be described with reference to Fig. 1. The constitution other than that of detection interconnects in the liquid crystal display device of Embodiment 1 is identical with that of well-known liquid crystal display devices. Accordingly, the detection interconnect
5 will be described specifically in the following description. Further, X, Y, and Z in the drawing show X axis, Y axis, and Z axis respectively. Further, while description of Embodiment 1 is to be made of a liquid crystal display panel as the display panel, it is not restricted thereto but may also be a constitution using, for example, an organic EL display panel, etc.

10 As shown in Fig. 1, a display device of Embodiment 1 includes a liquid crystal display panel PNL, and a capacitive touch panel (coordinate input device) TP attached to the liquid crystal display panel PNL on the side of the display surface (frontal side). The display device can detect the coordinate position in the direction XY on the liquid crystal display panel PNL. The liquid
15 crystal display panel PNL is bonded to the touch panel TP by a transparent, that is, light permeable adhesive ADL. On the other hand, a backlight device BL is disposed on the liquid crystal display panel PNL on the side of the back surface opposite the display surface. However, the touch panel TP is not restricted to the capacitive type but may be a touch panel of other type such as a resistive
20 type. Further, for bonding of the liquid crystal display panel PNL and the touch panel TP, a pressure sensitive adhesive such as a silicon gel which can be peeled and re-bonded may also be used instead of the adhesive ADL.

The liquid crystal display panel PNL includes a first substrate SUB1 and a second substrate SUB2. The substrates SUB1 and SUB2 are opposed
25 by way of a liquid crystal layer (not illustrated). The first substrate SUB1 is

larger than the second substrate SUB2 in the direction of Y axis. A driving circuit DR1 and a flexible printed substrate FPC1 are disposed on the first substrate SUB1 on the side of the main surface (liquid crystal surface) corresponding to the region greater than the second substrate SUB2, that is, exposed from the second substrate SUB2. The driving circuit DR1 supplies driving signals to pixels (not illustrated). The flexible printed substrate FPC1 supplies external signals, etc. to the driving circuit DR1. Further, well-known polarizing plates POL are disposed on the first substrate SUB1 on the side of the back surface, that is, on the side of the backlight device BL, and on the second substrate SUB2 on the side of the display surface respectively.

On the other hand, the touch panel TP includes a third substrate SUB3. A detection electrode (not illustrated) for detecting a contact position is formed on the side of the main surface of the third substrate SUB3, that is, on the side of a viewer. A flexible printed substrate FPC2 is connected to the end of the third substrate SUB3. The flexible printed substrate FPC2 includes a driving circuit DR2 for the touch panel TP provided on the side of the terminal surface. The driving circuit DR2 supplies driving signals to a detection electrode and detects the position of finger contact based on the capacitance change in driving signals supplied to the detection electrode. Further, a light shielding plate LSP and a protective plate (front protective plate) PP are bonded to the third substrate SUB3 by the adhesive ADL on the side of the main surface thereof. (Constitution of liquid crystal display panel and touch panel)

Then, a diagram for explaining the schematic constitution of the liquid crystal display panel of Embodiment 1 is shown in Fig. 2. A diagram for explaining the schematic constitution of the touch panel of Embodiment 1 is

shown in Fig. 3. The liquid crystal display device of Embodiment 1 will be described specifically with reference to Figs. 2 and 3. Fig. 3 is a plan view of the touch panel of Embodiment 1 as viewed from the side of the liquid crystal display panel. X and Y shown in Figs. 2 and 3 represent respectively X-axis and Y-axis, which correspond to X-axis and Y-axis shown in Fig. 1.

Referring to Fig. 2, the liquid crystal display panel PNL of Embodiment 1 includes a first substrate SUB1, a second substrate SUB2, and a liquid crystal layer (not illustrated). The first substrate SUB1 is formed with pixel electrodes PX, thin film transistors TFT, etc. The second substrate SUB2 is formed with a color filter (not illustrated) and a black matrix, the second substrate SUB2 being opposed to the first substrate SUB1. The liquid crystal layer (not illustrated) is put between the first substrate SUB1 and the second substrate SUB2. Further, an unillustrated backlight unit (backlight device) as a light source for the liquid crystal display panel PNL is provided on the side of the rear face. Such a backlight is combined with the liquid crystal display panel PNL so as to provide image display. The first substrate SUB1 and the second substrate SUB2 are fixed by means of a seal member SL applied in a circular shape at the periphery of the second substrate and also the liquid crystal is sealed thereby. In the following description, the liquid crystal display panel PNL is also referred to as a liquid crystal display device.

The first substrate SUB1 and the second substrate SUB2 are generally formed, for example, of a well known glass substrate as the substrate but the material is not restricted only to the glass substrate but other insulative substrates such as quartz glass or plastic (resin) may also be used. For example, the use of quartz glass allows the process temperature to be

increased. Thus the thin film transistor TFT has a densified gate insulating film, leading to improvement in reliability. In contrast, the use of a plastic (resin) substrate provides a liquid crystal display device light in weight and satisfactory in impact resistance.

5 Further, the liquid crystal display panel PNL of Embodiment 1 is such that a region formed with display pixels (hereinafter simply referred to as pixel) forms a display area AR in a region in which the liquid crystal is sealed. Accordingly, even if the liquid crystal is sealed in a region, that region not formed with the pixels and not used for display does not serve as the display area AR.

10 In the liquid crystal display device of Embodiment 1, scanning signal lines (gate lines) GL extends in the direction X and juxtaposed in the direction Y, while video signal lines (drain lines) DL extends in the direction Y and juxtaposed in the direction X in the surface of the first substrate SUB1 on the side of the liquid crystals and within the display area AR. A rectangular region
15 surrounded by the drain line DL and the gate line GL is a region where a pixel is formed by which the pixels are arranged in a matrix within the display area AR. As shown in an enlarged view A' of the circle A in Fig. 2, each of the pixels has a thin film transistor TFT, a pixel electrode PX, and a common electrode CT. The thin film transistor TFT is ON-OFF driven in response to a scanning signal from
20 the gate line GL. The pixel electrode PX is supplied with a video signal from the drain line DL by way of the thin film transistor TFT when it is turned ON. The common electrode CT is connected with the common line CL and supplied with a common signal having a potential as a reference to the potential of the video signal.

An electric field containing a component parallel to the main surface of the first substrate SUB1 is generated between the pixel electrode PX and the common electrode CT, thereby driving liquid crystal molecules. Such a liquid crystal display device is known as a device capable of so-called wide view angle display and is referred to as an IPS system (including IPS-Pro system), or a lateral electric field system in that it has the specificity of the application of electric field to the liquid crystal. Further, the liquid crystal display device of such a structure performs display by a normally black display with which light transmittance is minimized when the electric field is not applied to the liquid crystal (black display) and increase in light transmittance is enhanced by applying the electric field. The liquid crystal display panel may also be a vertical electric field type such as TN system or VA system. With such a vertical electric field type liquid display panel, a common electrode CT is forming on the second substrate SUB2 on the side of the main surface (on the side of the liquid crystal surface) and drives liquid crystal molecules by an electric field generated between the pixel electrode PX formed on the first substrate SUB1 and the common electrode CT formed on the second substrate SUB2.

Each of the drain lines DL and each of the gate lines GL are extended at their ends beyond the seal material SL respectively and connected to the driving circuit DR. In the liquid crystal display device of Embodiment 1, the driving circuit DR is formed of a semiconductor chip and is mounted on the first substrate SUB1. However, the liquid crystal display device of Embodiment 1 may mount, on the flexible printed substrate FPC, one or both of a video signal driving circuit of outputting the video signal and a scanning signal driving circuit of outputting the scanning signal in the form of a tape carrier system or a COF

(chip on film) system, whereby the driving circuit is connected to the first substrate SUB1.

In the structure of the common electrode CT shown in the enlarged view A', a common signal is inputted by way of the common line CL to the common electrodes CT formed independently on every pixel. However this is not limitative but the common electrodes CT may be formed so that the common electrodes CT for the pixels disposed in adjacent with each other in the direction X are connected directly, and a common signal may be inputted by way of the common line CL from one end or both of right and left ends in the direction X (end of the first substrate SUB1).

(Constitution of touch panel)

As shown in Fig. 3, the touch panel TP of Embodiment 1 also has a third substrate SUB3 comprising a flat transparent glass substrate or plastic substrate. The touch panel TP has electrodes formed on the third substrate SUB3 on the side of the main surface thereof (liquid crystal display panel) in this embodiment. The electrodes are used to detect a position of contact with an operator's finger (not illustrated), etc. For example, first detection electrodes YSE extend in the direction X and are juxtaposed in the direction Y for detecting the coordinate position in the direction Y. Second detection electrodes XSE extend in the direction Y and are juxtaposed in the direction X for detecting the coordinate position in the direction X, with the electrodes YSE and electrodes XSE being intersected by way of an insulating film (not illustrated). In Embodiment 1, the first detection electrodes YSE and the second detections electrode XSE are formed in the transparent region TTA of the touch panel TP, thereby allowing for detection of the coordinate positions in the direction X and

in the direction Y within the transparent region TTA. Since the liquid crystal display panel PNL is disposed at the back of the touch panel TP, the first detection electrodes YSE and the second detection electrodes XSE, and an unillustrated insulating film which are formed within the transparent region TTA should be formed of a transparent material so that an operator can view the display content displayed on the liquid crystal panel.

Further, in the touch panel TP of Embodiment 1, a signal interconnect (first signal interconnect) SIG1 for connecting the first detection electrodes YSE and the second detection electrodes XSE with an electrode terminal (first electrode terminal) TRM1 is disposed in the region outside the transparent region TTA. In this case, the first detection electrodes YSE are juxtaposed in the direction Y. Accordingly, the signal interconnect SIG1 connected to the ends of the first detection electrodes YSE are formed between the right and left of the transparent region TTA and the periphery of the third substrate SUB3 in the drawing and connected with the electrode terminal TRM1. Further, the second detection electrodes XSE are juxtaposed in the direction X. Accordingly, the second detection electrodes XSE are connected to the electrode terminal TRM1 by the signal interconnect SIG1 formed in a region between the lower portion of the transparent region TTA in the drawing and the electrode terminal TRM1.

Further, in the touch panel TP of Embodiment 1, the opening PPO of the light shielding plate LSP is formed smaller than the transparent region TTA and larger than the display area AR of the liquid crystal display panel. With such a constitution, the contact position associated with the image displayed at the end of the display area AR is detected reliably. Further, the opening PPO

is formed smaller than the transparent region TTA in which the first detection electrodes YSE and the second detection electrodes XSE are formed, thereby reliably detecting the contact position at the end of the transparent region TTA.

The touch panel TP of Embodiment 1 is configured such that a

5 detection interconnect (second signal interconnect) SIG2 is formed outside of the signal interconnect SIG1. In particular, the detection interconnect SIG2 of Embodiment 1 is formed along the peripheral edge portion corresponding to sides (upper side and right and left sides in Fig. 3) other than one side in which the electrode terminals of the third substrate SUB3 are formed. Further, in

10 Embodiment 1, the interconnect width and the position in forming the interconnect are properly determined according to the accuracy of the exposure device and the etching device, etc. used for forming the detection interconnect SIG2 on the third substrate SUB3, and the allowance for the size of substrate chipping NP when it is present. Further, the interconnect width of the detection

15 interconnect SIG2 is formed such that the interconnect width is uniform. However, the interconnect width of the detection interconnect SIG2 is not always restricted to the uniform interconnect width. A plurality of electrode terminals TRM1 are arranged along one side of the third substrate SUB3. For the detection interconnect SIG2 of Embodiment 1, one end of the detection

20 interconnect SIG2 is connected to one of a pair of the outermost terminals of paired electrode terminals TRM1 arranged along one side of the third substrate SUB3, and the other end of the detection interconnect SIG2 is connected to the other of a pair of the outermost terminals of the paired electrode terminals TRM1. Further, the detection interconnect SIG2 of Embodiment 1 is formed of

25 a thin metal film such as aluminum of low transmittance to light (particularly, light

in a visible region). As described above, the signal interconnect SIG1 and the detection interconnect SIG2 are formed in an identical layer and they can be formed in one identical step by forming the detection interconnect SIG2 using a thin metal film such as of aluminum used for forming the signal interconnect SIG1. This can exhibit a particularly satisfactory effect of forming the detection interconnect SIG2 without increase in the number of manufacturing steps. Further, by making the detection interconnect SIG2 of the low transmittance thin metal film, disconnection inspection for the detection interconnect SIG2 by inspector's visual observation upon generation of chipping or cracking in the third substrate SUB3 can be performed with ease.

The detection interconnect SIG2 may also be formed of two or more laminate thin films, where at least one single layer of the laminate film is made of a material of lower transmittance than that of the adjacent region. Further, a colorant material may be incorporated in at least one layer of the laminate film forming the detection interconnect SIG2 (colored layer). With such a constitution, the same effect can be exhibited as that attained when the detection interconnect SIG2 is made of a low transmittance thin single film layer.

Further, the touch panel TP of Embodiment 1 is configured such that electrode terminals (not illustrated) of the flexible printed substrate FPC2 are connected electrically to the electrode terminals TRM1 of the touch panel TP. In this case, a driving signal from the driving circuit DR2 is supplied by way of the electrode terminal TRM1, and a detection signal is outputted to the driving circuit DR2. As shown in Fig. 8, in the flexible printed circuit FPC2 of the touch panel TP in Embodiment 1, the electrode terminals (second electrode terminals) TRM2 formed on the flexible printed substrate FPC2 in the lower portion of the

drawing have electrode terminals connected electrically with the detection interconnect SIG2. Specifically, the paired electrode terminals TRM2 disposed on the outermost side among the electrode terminals TRM2 on the side connected to an external system (not illustrated) are electrically connected with the detection interconnect SIG2 by way of signal interconnects FSG on the flexible printed substrate FPC.

(Detection of substrate chipping)

Fig. 4 is a diagram showing a situation where chipping occurs in the third substrate of the touch panel in the liquid crystal display device of Embodiment 1 shown in Fig. 3. The detection operation in the case where chipping (substrate chipping) NP occurs in the third substrate SUB3 of the touch panel will be described with reference to Fig. 4.

The touch panel TP of Embodiment 1 includes a detection interconnect SIG2 formed along the peripheral edge portion of a third substrate SUB3. As a result, if chipping NP occurs in the third substrate SUB3 due to handling or other works of the touch panel after the detection interconnect SIG2 has been formed, then a portion of the detection interconnect SIG2 is absent together with the substrate chipping NP, resulting in disconnection, as shown in Fig. 4. When the region of the substrate chipping NP has a predetermined size or more, an inspector can easily find (detect) the chipping NP by visual observation because the detection interconnect SIG2 of Embodiment 1 is formed of a material having a low transmittance or permeability.

Further, also when chipping NP occurs in the third substrate SUB3 due to handling or other works upon bonding of the touch panel TP to the liquid crystal display panel PNL, a portion of the detection interconnect SIG2 is absent

together with the substrate chipping NP, resulting in disconnection, as shown in Fig. 4. In this case, as shown in Fig. 1, since the chipping NP occurrence location in the third substrate SUB3 is a region put between a light shielding plate LSP and a liquid crystal display panel PNL, it was impossible to find such chipping NP with the existent constitution. By contrast, the touch panel TP of Embodiment 1 has the detection interconnect SIG2 formed of a single thin conductive film connected to the electrode terminal TRM1 at opposite ends. Therefore, presence or absence of disconnection of the detection interconnect SIG2 can be inspected by measuring a portion between the electrode terminals TRM2 led out to the flexible printed substrate FPC. This disconnection of the detection interconnect SIG2, that is, chipping NP in the third substrate SUB3 can be detected easily, for example, by measuring the resistance value between the electrode terminals TRM2 connected to the detection interconnect SIG2 with a measuring instrument for electric resistance or by inputting a pulse signal to one of the electrode terminals TRM2 and detecting the signal at the other electrode terminal TRM2. Further, based on the result of the measurement by the disconnection inspection, when disconnection of the detection interconnection SIG2 is not detected, it can be judged that no chipping NP occurs in the third substrate SUB3, or judged that there is chipping NP within the predetermined allowance even when chipping NP occurs. On the other hand, if disconnection of the detection interconnect SIG2 is detected, it can be judged that chipping NP over the allowance, which affects also the signal interconnect SIG1, occurs. Further, disconnection by the measurement between the electrode terminals TRM2 connected with the detection interconnect SIG2 can be measured also before bonding with the liquid crystal display panel PNL.

By contrast, if the substrate chipping NP is small or cracking occurs in the direction Y in Fig. 4, then the region where the detection interconnect SIG2 is absent is remarkably small and it is quite difficult to find the same based on the visual inspection of an inspector. However, for the touch panel TP

5 according to Embodiment 1, presence or absence of chipping NP or cracking in the third substrate SUB3 can be inspected by a simple and convenient inspection, conduction test for the detection interconnect SIG2.

As has been described above, the display device of Embodiment 1 has a capacitive type touch panel disposed on the liquid crystal display panel on the

10 side of the display surface, the liquid crystal display panel displaying images based on the video signals from an external system. The touch panel of Embodiment 1 includes the detection interconnect made of the thin electroconductive metal film of a low transmittance extended along the peripheral edge portion of the third substrate in such a manner as to surround

15 the region in which to form the signal interconnect for connecting the first and second detection electrodes with the electrode terminals and to surround the transparent region where the contact position can be detected, with the detection interconnect having one end connected to the electrode terminal and the other end connected to the other electrode terminal. Accordingly, the

20 inspector can easily inspect substrate chipping in the third substrate by visual observation before bonding of the liquid crystal display panel to the touch panel. In addition, the inspector can inspect substrate chipping by simple measurement such as measurement for resistance, pulse, or the like between the electrodes connected with the detection interconnect even after fixing of the liquid crystal

25 display panel and the touch panel.

(Embodiment 2)

Fig. 5 is a diagram for explaining a schematic constitution of a touch panel in a display device according to Embodiment 2 of the invention. Fig. 5 particularly is a front elevational view corresponding to Fig. 4 of Embodiment 1, that is, a front elevational view showing a touch panel in the case where a substrate chipping occurs at one location of a third substrate of the touch panel. However, the display device of Embodiment 2 is different from that of the display device of Embodiment 1 in constitution only for the detection interconnects SIG2 and SIG3 and the electrode terminals TRM1 and TRM2 of the touch panel TP, and the constitution of the liquid crystal display panel and other constitution of the touch panel are identical with that of the display device of Embodiment 1. Accordingly, the following contains detailed description of the constitution of the detection interconnects SIG2, SIG3, and the electrode terminals TRM included in the touch panel. In the following description, the detection interconnect on the side nearer to the peripheral edge portion of the substrate SUB3 is referred to as a first detection interconnect SIG2, and the detection interconnect on the side distant from the peripheral edge portion of the third substrate SUB3 is referred to as a second detection interconnect SIG3. Further, while Embodiment 2 includes description made of an example having two independent detection interconnects SIG2 and SIG3, three or more independent detection interconnects may be formed.

As shown in Fig. 5, also the touch panel TP of Embodiment 2 has a third substrate comprising a flat transparent glass substrate and has two different detection interconnects SIG2 and SIG3. Further, each of the detection interconnects SIG2 and SIG3 is formed in a region outside the interconnect

region where the interconnect of the signal interconnect SIG1 is formed, that is, in a region between the signal interconnect SIG1 and the peripheral side of the third substrate SUB3, similar to Embodiment 1. Further, also the detection interconnects SIG2 and SIG3 of Embodiment 2 are formed along the peripheral edge portion of sides (upper side and right and left sides in Fig. 5) other than one side in which the electrode terminals TRM1 of the third substrate SUB3 are formed. In the touch panel TP of Embodiment 2, a first detection interconnect SIG2 is disposed on the side near to the peripheral edge portion of the third substrate SUB3 and a second detection interconnect SIG3 is disposed on the side distant from the peripheral edge portion of the third substrate SUB3, that is, on the side near to the signal interconnect SIG1.

For the first detection interconnect SIG2 of Embodiment 2, one end of the first detection interconnect SIG2 is connected to one of a pair of the outermost terminals of paired electrode terminals TRM1 arranged along one side of the third substrate SUB3 (lower portion in Fig. 5), and the other end of the second detection interconnect SIG3 is connected to the other of a pair of the outermost terminals of the paired electrode terminals TRM1. Further, for the second detection interconnect SIG3, ends of the second detection interconnect SIG3 are connected to the the electrode terminals TRM1 adjacent inwardly of the paired electrode terminals TRM1 connected with the first electrode interconnect SIG2. With the constitution described above, the first detection interconnect SIG2 and the second detection interconnect SIG3 can be formed on the same layer as is the signal interconnect SIG1, that is, they can be manufactured by the same step and same interconnect material as is the signal interconnect SIG1.

The same satisfactory effect as that described for Embodiment 1 can be obtained by forming the first detection interconnect SIG2 and the second detection interconnect SIG3 in the same step as that for the signal interconnect SIG1. Further, a conductive transparent thin film layer may be formed in the same step as is the first detection electrodes YSE or the second direction electrodes XSE and then the first detection interconnect SIG2 and the second detection interconnect SIG3 comprising a laminate of a conductive or non-conductive colored layer, etc. may be formed. In this case, signal interconnects comprising different thin film materials may be provided, for example, by forming the first detection interconnect SIG2 in the same step as that for the signal interconnect SIG1 and forming the second detection interconnect SIG3 in the same step as that for the first detection electrodes YSE or the second detection electrodes XSE. Thin film materials for the first detection interconnect SIG2 and the second detection interconnect SIG3 may be other thin film materials so long as they form a thin conductive film at low transmittance to light in a visible light region. By forming the detection interconnect SIG2 with such a thin metal film at low transmittance, an inspector can easily inspect, by visual observation, disconnection of the first detection interconnect SIG2 and the second detection interconnect SIG3 when chipping or cracking of the third substrate SUB3 occurs.

Further, also in the touch panel TP of Embodiment 2, electrode terminals TRM1 connected electrically with the first detection interconnect SIG2 and the second detection interconnect SIG3 respectively are formed for the electrode terminals TRM2 formed in the lower portion of the flexible printed substrate FPC2 in the drawing.

Then, an inspection method for substrate chipping NP in the touch panel TP of Embodiment 2 will be described with reference to Fig. 5. In the following, description will be made of a situation where the end of the substrate chipping NP terminates at a portion between the first detection interconnect SIG2 and the second detection interconnect SIG3 as shown in Fig. 5.

If chipping NP occurs in the third substrate SUB3 due to handling or other works of the touch panel after the detection interconnect SIG2 is formed and before the touch panel is fixed to the liquid crystal display panel, a portion of the detection interconnect SIG2 is absent together with the substrate chipping NP, resulting in disconnection, as shown in Fig. 5. In this situation, since the first detection interconnect SIG2 is formed of a low transmittance material or an impermeable material, the inspector can easily find (detect) the chipping NP by visual observation as long as the touch panel is not bonded to the liquid crystal display panel. On the other hand, if chipping NP occurs in the third substrate during the bonding step of the touch panel to the liquid crystal display panel or during the subsequent handling, then presence or absence of disconnection of the detection interconnect SIG2 can be inspected by measuring a portion between the electrode terminals TRM2 led out to the flexible printed substrate FPC. The reason is that both ends of each of the first detection interconnect SIG2 and the second detection interconnect SIG3 are connected with the electrode terminals TRM2 by way of the electrode terminals TRM1.

In the touch panel TP of Embodiment 2, the first detection interconnect SIG2 and the second detection interconnect SIG3 are detection interconnects independent of each other along the peripheral edge portion of the third substrate SUB3. Accordingly, based on the result of measurement in the

disconnection inspection for the first detection interconnect SIG2 and the second detection interconnect SIG3, with the inspection being so simple and convenient inspection, it is possible to recognize the presence or absence for the occurrence of the substrate chipping NP in the third substrate SUB3, which is the same effect as that of Embodiment 1 described previously. In addition, it is possible to recognize the size for the substrate chipping NP, that is, how much the substrate chipping NP occur. For example, when disconnection is not detected for the two first detection interconnect SIG2 and the second detection interconnect SIG3, it can be judged that no chipping NP occurs in the third substrate SUB3, or it can be judged that quite slight substrate chipping NP occurs within an allowable range even if the chipping NP occurs. Further, as shown in Fig. 5, if it is detected that disconnection occurs in only the first detection interconnect SIG2, then it can be judged that the substrate chipping NP occurs but levels of substrate chipping NP fall within a predetermined allowable range. In contrast, if disconnection is detected in both of the detection interconnects of the first detection interconnect SIG2 and the second detection interconnect SIG3, it can be judged that substrate chipping NP over the allowance, which affects also the signal interconnect SIG1, occurs.

Likewise, also in a case where cracking occurs on the third substrate SUB3, cracking can be judged in the same manner as the substrate chipping NP based on the result of detection for the two detection interconnects, that is, the first detection interconnect SIG2 and the second detection interconnect SIG3. Thus the presence or absence for the occurrence of cracking in the third substrate SUB3, and the size of cracking, that is, the how much cracking occurs can be recognized by a simple and convenient inspection.

The touch panel TP of Embodiment 2 has such a configuration that the first detection interconnect SIG2 and the second detection interconnect SIG3 are independent of each other. Thus presence or absence of disconnection in the interconnects can be measured by different measuring methods even when
5 the presence or absence of the disconnection in the two detection interconnects is measured collectively. For example, it is possible to measure a resistance value by applying a DC voltage to the corresponding electrode terminals in the measurement for the presence or absence of disconnection in the first detection interconnect SIG2. On the other hand, for the measurement for the presence
10 or absence of the disconnection in the second detection interconnect SIG3, a pulse voltage is applied to the corresponding electrode terminals, thereby measuring the output from the electrodes.

In Embodiment 2, while description has been made of an example of a detection interconnect where the first detection interconnect SIG2 and the
15 second detection interconnection SIG3 comprise the same thin film material formed in one identical layer, they are not limitative. For example, at least one of the detection interconnects of the first detection interconnect SIG2 and the second detection interconnect SIG3 may be formed of a thin metal film having a lower transmittance than that of the other detection interconnect. Only one of
20 the detection interconnects may have a colored layer of an optional color. Further, while it has been explained for Embodiment 2 to an example where the first detection interconnect and the second detection interconnect are formed of a uniform interconnect width, and the interconnect width, etc. are identical between the first detection interconnect and the second detection interconnect,

they are not limitative but they may be formed of different interconnect widths or different colors.

(Embodiment 3)

Fig. 6 is diagram for explaining the schematic constitution of a touch panel in a display device according to Embodiment 3 of the invention, which is a front elevational view showing a touch panel in which substrate chipping NP identical with that in Embodiment 2 occurs. However, the display device of Embodiment 3 is different from that of the display device of Embodiment 2 in constitution only for the detection interconnects SIG2 and SIG3 and the electrode terminals TRM1 and TRM2 of the touch panel TP. The constitution of the liquid crystal display panel and other constitution of the touch panel are identical with the display device of Embodiment 2. Accordingly, the following contains detailed description of the constitution of the detection interconnects SIG2, SIG3, and the electrode terminals TRM1 and TRM2.

As shown in Fig. 6, also in the touch panel TP of Embodiment 3, the first detection interconnect SIG2 is disposed on the side near to the peripheral edge portion of the third substrate SUB3 and the second detection interconnect SIG3 is disposed on the side distant from the peripheral edge portion of the third substrate SUB3, that is, on the side near the signal interconnect SIG1. In this case, respective one ends of the first detection interconnect SIG2 and the second detection interconnect SIG3 (on the left in Fig. 6) are connected with different electrode terminals TRM1 in the same manner as in Embodiment 2. On the other hand, respective other ends of the first detection interconnect SIG2 and the second detection interconnect SIG3 (on the right in the Fig. 6) are connected with an identical electrode terminal TRM1 as shown by a circle B in

Fig. 6. Also the first detection interconnect SIG2 and the second detection interconnect SIG3 may be detection interconnects in the identical layer comprising an identical thin film material, or detection interconnects formed in different layers comprising different thin film materials in the same manner as in Embodiment 2.

As has been described above, in the touch panel TP of Embodiment 3, other ends of the first detection interconnect SIG2 and the second detection interconnect SIG3 (on the right in Fig. 6) are connected with an identical electrode terminal on the third substrate SUB3. This can provide an outstanding effect capable of decreasing the number of terminals for the electrode terminals TRM1 than that of Embodiment 2 in addition to the effect of Embodiment 2 described previously.

It is possible to decrease, in a flexible printed substrate FPC, the number of electrode terminals contacted and connected opposing to the electrode terminals TRM1 formed in the third substrate SUB3, the number of electrode terminals TRM2, as well as the number of signal interconnects electrically connecting the electrode terminals to each other. The cost of the flexible printed substrate FPC greatly depends on the shape and the area. Since the area of the flexible printed substrate FPC can be decreased by decreasing the number of the electrode terminals and the number of the signal interconnects, this can provide a satisfactory effect capable of decreasing the cost of the flexible printed substrate FPC, and, at the same time, capable of decreasing the cost of the touch panel TP and the display device of Embodiment 3 using the flexible printed substrate FPC.

(Embodiment 4)

Fig. 7 is a diagram for explaining a schematic constitution of a touch panel in a display device according to Embodiment 4 of the present invention, which is a front elevational view corresponding to Fig. 4 of Embodiment 1, that is, a front elevational view in which chipping occurs in the third substrate of the touch panel. However, the display device of Embodiment 4 is different in constitution only for the electrode terminals of the flexible printed substrate FPC of the touch panel TP and other constitutions are identical with that of Embodiment 1. Accordingly, in the following description, constitution of the flexible printed substrate FPC will be described specifically. Constitution of the flexible printed substrate FPC of Embodiment 4 is applicable also to the touch panel of Embodiments 2 and 3.

As shown in Fig. 7, the flexible printed substrate FPC of Embodiment 4 includes electrode terminals TRMT exclusively used for inspection corresponding to the detection interconnect SIG2 disposed at positions different from the positions where the electrode terminals TRM2 are formed. In particular, the electrode terminals TRMT of Embodiment 4 are formed at positions nearer to the electrode terminals TRM1 than the electrode terminals TRM2, that is, at positions near the main body of the touch panel TP. For obtaining such a constitution, the flexible printed substrate FPC of the touch panel TP according to Embodiment 4 has electrode terminals (not illustrated) of the same number connected to the electrode terminals TRM1 on the upper end in the drawing, that is, on the side connected with the third substrate SUB3. Further, the flexible printed substrate FPC has electrode terminals TRM2 by the number obtained by subtracting the number of the electrode terminals connected with the detection interconnect SIG2 from the number of the

electrode terminals for the electrode terminals TRM1 on the side of the lower end in the drawing. In this case, the electrode terminals at the upper end portion and the electrode terminals TRM2 at the lower end of the flexible printed substrate FPC are connected respectively by signal interconnects (not
5 illustrated) formed on the base material of the flexible printing substrate FPC and the signal interconnect SIG1 is electrically led out to the electrode terminals TRM2. Further, in the flexible printed substrate FPC of Embodiment 4, the electrode terminal (third electrode terminal) TRMT formed in a region (position) different from the electrode terminal TRM2 is connected with the electrode
10 terminal on the flexible printed substrate FPC corresponding to the electrode terminal TRM1 connected with the detection interconnect SIG2 by way of the signal interconnect FSG in the flexible printed substrate FPC. The detection interconnect SIG2 is electrically led out to the flexible printed substrate FPC to the electrode terminal TRMT. The electrode terminal TRMT may also be
15 formed to one surface or both surfaces of the flexible printed substrate FPC either on the side of the surface or on the side of the rear face.

As has been described above, in the Embodiment 4, the electrode terminal TRMT on the side of the flexible printed substrate FPC connected with the detection interconnect SIG2 is formed in a region different from the electrode
20 terminal TRM1 connected to the signal interconnect SIG1. Thus there is exhibited a satisfactory effect of connecting measuring equipment to the electrode terminal TRMT and further shortening the time required for inspection in addition to the effect of the Embodiment 1.
(Embodiment 5)

Fig. 9 is a diagram for explaining the schematic constitution of a liquid crystal display panel as a display device according to Embodiment 5 of the invention in which other constitutions except for the constitution of the detection interconnect SIG3 and the electrode terminals TRM3 are identical with those of the liquid crystal display panel of Embodiments 1 to 4. Accordingly, in the following description, the constitution of the detection interconnect SIG3 and the electrode terminals TRM3 will be described specifically. Further, for the liquid crystal display panel PNL according to Embodiment 5, description is to be made of an example of using a single detection interconnecting SIG3 in the same manner as in Embodiment 1, but a plurality of detection interconnects SIG3 may also be disposed in the same manner as in Embodiments 2 and 3. Further, the electrode terminals connected to the detection interconnect SIG3 may be disposed at positions different from those for the electrode terminals on the side receiving the display data, control signals, etc. that is, a group of electrode terminals juxtaposed on the side connected with the external system, in the electrode terminals (not illustrated) of the flexible printed substrate FPC in the same manner as in Example 4. In Embodiment 5, while the detection interconnect SIG3 is disposed on the liquid crystal display panel PNL as the display device in Embodiment 5, this is not limitative but applicable also to other display devices such as an organic EL display device.

As shown in Fig. 9, the drain lines DL and the gate lines GL formed in the display area AR is extended beyond the seal material SL and connected as a signal interconnect (third signal interconnect) SIG4 to the driving circuit DR1. Further, the driving circuit DR1 is connected also with the electrode terminal TRM3 by the signal interconnect SIG4, and the display data or control signals

are inputted to the driving circuit DR1 by way of the flexible printed substrate FPC1 connected to a lower portion of the first substrate SUB1 in the drawing.

In the first substrate SUB1 constituting the liquid crystal display panel PNL of Embodiment 5, a detection interconnect (fourth signal interconnect) SIG2 is formed along the peripheral edge portion thereof. Ends of the detection interconnects SIG2 are connected to different electrode terminals TRM3 respectively, and led out by way of the flexible printed substrate FPC. In the liquid crystal display panel PNL of Embodiment 5, a common line (not illustrated) connected with the not illustrated common electrode and signal interconnects (not illustrated) connected with the common line are also formed inside the detection interconnect SIG2, that is, in a region surrounded by the detection interconnect SIG2.

In the liquid crystal display panel PNL of Embodiment 5, the driving circuit DR1 is disposed in the lower portion of the first substrate SUB1 in the drawing but the configuration for the driving circuit DR1 is not restricted thereto. For example, when a gate driving circuit forming a gate signal by thin film transistor are formed on the right and left of the display area AR in the drawing, the detection interconnect SIG3 is formed so as to surround the gate driving circuit and the signal interconnect connected to the gate driving circuit. The detection interconnect SIG3 is formed in a region between the portion nearest to the peripheral side of the first substrate and the peripheral side of the first substrate SUB1 among the gate driving circuits and the signal interconnects.

As has been described above, in the display device of Embodiment 5, the detection interconnect SIG3 is formed in a region between the display area AR and the peripheral side of the first substrate SUB1 in a region in the upper

portion in the drawing where the signal interconnect SIG4 is not formed, and the detection interconnect SIG3 is formed in a region between the signal interconnect SIG4 and the peripheral edge portion of the first substrate SUB1 in a region where the signal interconnect SIG4 is formed along the peripheral edge portion of the first substrate SUB1. Thus the inspector can easily inspect the substrate chipping in the first substrate SUB1 easily by visual observation, as well as substrate chipping can be detected by simple measurement such as resistance or pulse measurement between electrodes connected with the detection interconnect SIG3.

10 In the touch panel of the display devices of Embodiments 1 to 4, while description has been made of the example of applying the present invention to the capacitive type touch panel capable of detecting two or more detection positions, this not limitative but the invention is also applicable to touch panels of other systems such as a resistance type.

15 Further, in the touch panel in the display device of Embodiments 1 to 4, the electrode terminals connected with the detection interconnect SIG2 is formed also on the flexible printed substrate connected with the third substrate but this is not limitative and electrode terminal may also be formed only to the third substrate.

20 While inventions made by the inventor have been described specifically with reference to the embodiments of the invention, the inventions are not limited to the embodiments described above but can be modified variously within the range not departing the gist thereof.

Claims

1. A display device comprising:
 - a coordinate input substrate having detection electrodes disposed in a detection region, and first interconnects outside the detection region;
 - a protective plate on the coordinate input substrate;
 - a light shielding material which has an opening and is disposed between the coordinate input substrate and the protective plate; and
 - a first flexible substrate electrically connected to the coordinate input substrate, wherein the coordinate input substrate has a second interconnect, a first electrode, and a second electrode,
 - wherein the second interconnect surrounds the detection region and is formed outside the interconnects,
 - wherein the first electrode is formed at one end of the second interconnect,
 - wherein the second electrode is formed at the other end of the second interconnect,
 - wherein the second interconnect is disposed along a peripheral edge of at least three sides of the coordinate input substrate,
 - wherein a display region is surrounded by the second interconnect,
 - wherein the first electrode is electrically connected with a third electrode on the first flexible substrate, or the second electrode is electrically connected with a fourth electrode on the first flexible substrate,
 - wherein the opening of the light shielding material is larger than the display region and surrounds the display region, and
 - wherein the light shielding material overlaps the second interconnect along the peripheral edge of at least the three sides of the coordinate input substrate in a plan view.
2. The display device according to claim 1, further comprising a display panel having the display region,
 - wherein the coordinate input substrate is disposed between the display panel and the protective plate.

3. The display device according to claim 1, further comprising a first semiconductor chip,
wherein a third interconnect and the first semiconductor chip are disposed on the first flexible substrate,
wherein the third electrode is formed at one end of the third interconnect,
wherein a fifth electrode is formed at the other end of the third interconnect, and
wherein the first semiconductor chip doesn't overlap the third interconnect and the fifth electrode in a plan view.
4. The display device according to claim 3, wherein the first semiconductor chip drives the coordinate input substrate.
5. The display device according to claim 3, wherein the third interconnect extends from the third electrode to the fifth terminal along an edge of the first flexible substrate and is disposed between the first semiconductor chip and the edge of the first flexible substrate.
6. The display device according to claim 3, wherein a fourth interconnect is disposed on the first flexible substrate,
wherein the fourth electrode is formed at one end of the fourth interconnect,
wherein a sixth electrode is formed at the other end of the fourth interconnect,
wherein the first semiconductor chip is disposed between the third interconnect and the fourth interconnect in plan view, and
wherein the first semiconductor chip doesn't overlap the fourth interconnect and the sixth terminal in a plan view.
7. The display device according to claim 3, wherein the first flexible substrate supplies driving signals to the detection electrodes via the first interconnects and receives detection signals corresponding to a contact position from the detection electrodes.
8. The display device according to claim 2, wherein the display panel comprises:

a first substrate on which a plurality of video signal lines and a plurality of scanning signal lines intersecting the video signal lines are formed; and

a second flexible substrate electrically connected to the first substrate,

wherein a plurality of seventh electrodes, a fifth interconnect, an eighth electrode and ninth electrode are formed on the first substrate,

wherein the seventh electrodes receive video signals and scanning signals from an external system, the eighth electrode is formed at one end of the fifth interconnect, and the ninth electrode formed at the other end of the fifth interconnect,

wherein a plurality of tenth electrodes, a eleventh electrode, twelfth electrode are formed on the second flexible substrate, and the plurality of tenth electrodes are formed between the eleventh electrode and the twelfth electrode,

wherein the tenth electrodes are connected to the seventh electrodes, the eleventh electrode is connected to the eighth electrode, the twelfth electrode is connected to the ninth electrode, and

wherein the fifth interconnect is disposed along a peripheral edge of at least three sides of the first substrate.

9. The display device according to claim 8, wherein the display panel further comprises a second semiconductor chip receiving the video signals, supplying display signals to the video signal lines, and controlling the video signal lines and the scanning signal lines,

wherein the second semiconductor chip is formed on the first substrate and is surrounded by the fifth interconnect.

10. The display device according to claim 1, wherein the opening of the light shielding material is smaller than the detection region of the coordinate input substrate.

11. The display device according to claim 1, further comprising:

a sixth interconnect surrounds the detection region and is formed outside the first interconnects,

wherein the sixth interconnect is electrically connected with the first flexible substrate,

and

wherein the sixth interconnect is disposed along a peripheral edge of at least three sides of the coordinate input substrate.

12. A coordinate input device comprising:

a coordinate input substrate having detection electrodes disposed in a detection region, and first interconnects outside the detection region; and

a first flexible substrate electrically connected to the coordinate input substrate,

wherein the coordinate input substrate has a second interconnect, a first electrode, and a second electrode,

wherein the second interconnect surrounds the detection region and is formed outside the first interconnects,

wherein the first electrode is formed at one end of the second interconnect,

wherein the second electrode is formed at the other end of the second interconnect,

wherein the second interconnect is disposed along a peripheral edge of at least three sides of the coordinate input substrate, and

wherein the first electrode is electrically connected with a third electrode on the first flexible substrate, or the second electrode is electrically connected with a fourth electrode on the first flexible substrate.

13. The coordinate input device according to claim 12, further comprising a first semiconductor chip,

wherein a third interconnect and the first semiconductor chip are disposed on the first flexible substrate,

wherein the third electrode is formed at one end of the third interconnect,

wherein a fifth electrode is formed at the other end of the third interconnect, and

wherein the first semiconductor chip doesn't overlap the third interconnect and the fifth electrode in a plan view.

14. The coordinate input device according to claim 13,

wherein the first semiconductor chip drives the coordinate input substrate.

15. The coordinate input device according to claim 13,
wherein the third interconnect extends from the third electrode to the fifth electrode along an edge of the first flexible substrate and is disposed between the first semiconductor chip and the edge of the first flexible substrate.

16. The coordinate input device according to claim 13,
wherein a fourth interconnect is disposed on the first flexible, substrate,
wherein the fourth electrode is formed at one end of the fourth interconnect,
wherein a sixth electrode is formed at the other end of the fourth interconnect,
wherein the first semiconductor chip is disposed between the third interconnect and the fourth interconnect in plan view, and
wherein the first semiconductor chip doesn't overlap the sixth electrode and the fourth interconnect in plan view.

17. The coordinate input device according to claim 12,
wherein the opening of the light shielding material is smaller than the detection region of the coordinate input substrate.

18. The coordinate input device according to claim 17,
wherein the first flexible substrate supplies driving signals to the detection electrodes via the first interconnects and receives detection signals corresponding to a contact position from the detection electrodes.

19. The coordinate input device according to claim 12, further comprising:
a sixth interconnect surrounds the detection region and is formed outside the first interconnects,
wherein the sixth interconnect is electrically connected with the first flexible substrate,
and
wherein sixth interconnect is disposed along a peripheral edge of at least three sides of the coordinate input substrate.

ABSTRACT OF THE DISCLOSURE

A display device includes a display panel, a light shielding plate having an opening, a protective plate, and a coordinate input device having a
5 transparent substrate, and a first flexible interconnect substrate. The coordinate input device is disposed on the display panel at the side of a display screen, and each of the light shielding plate and the protective plate is arranged on the coordinate input device on the opposite side of the display panel. The coordinate input device has first signal interconnects and a second signal interconnect
10 disposed outside the first signal interconnects but near a peripheral edge of the transparent substrate. The second signal interconnect is formed of a thin conductive film disposed along a peripheral edge portion of the transparent substrate, and is disposed along the peripheral edge of three sides of the transparent substrate.

FIG. 1

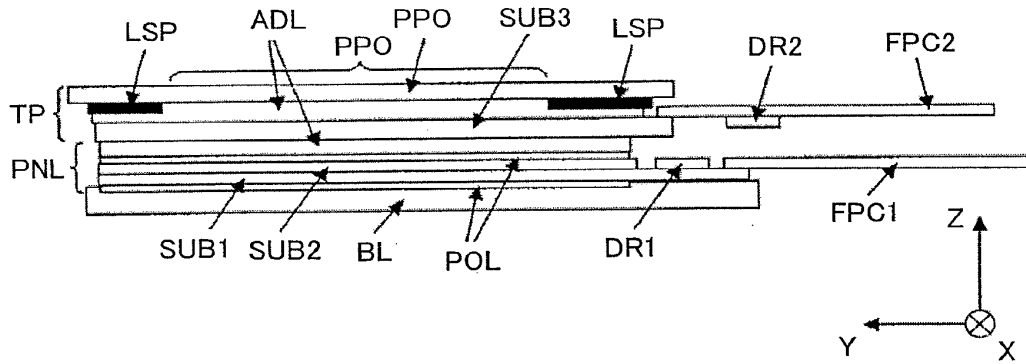


FIG. 2

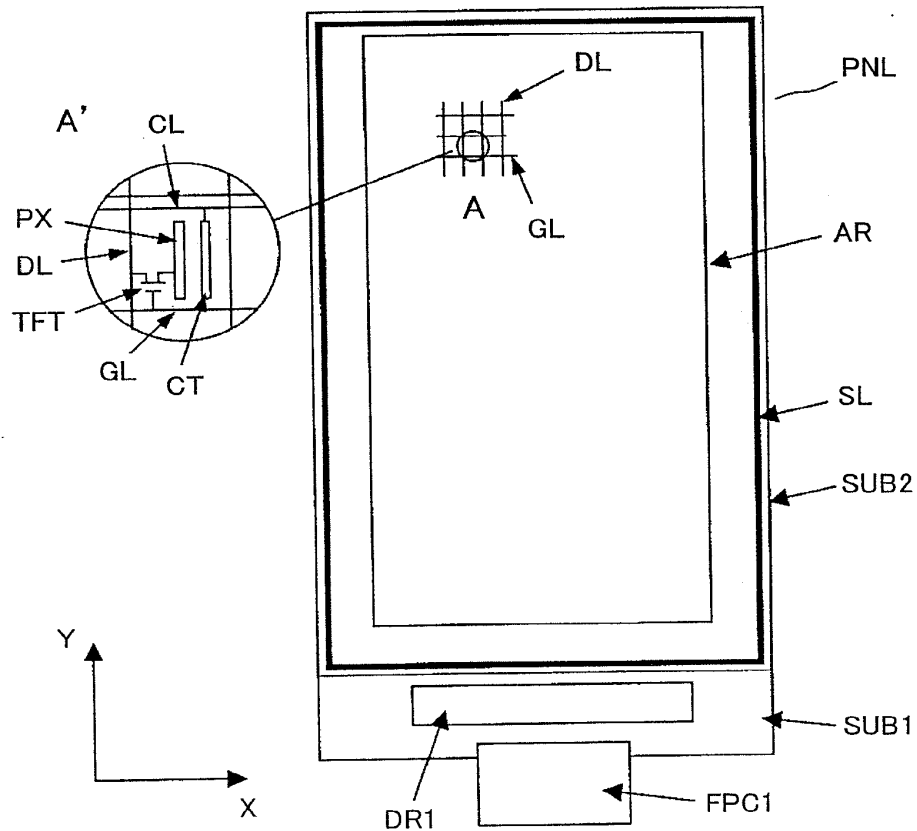


FIG. 3

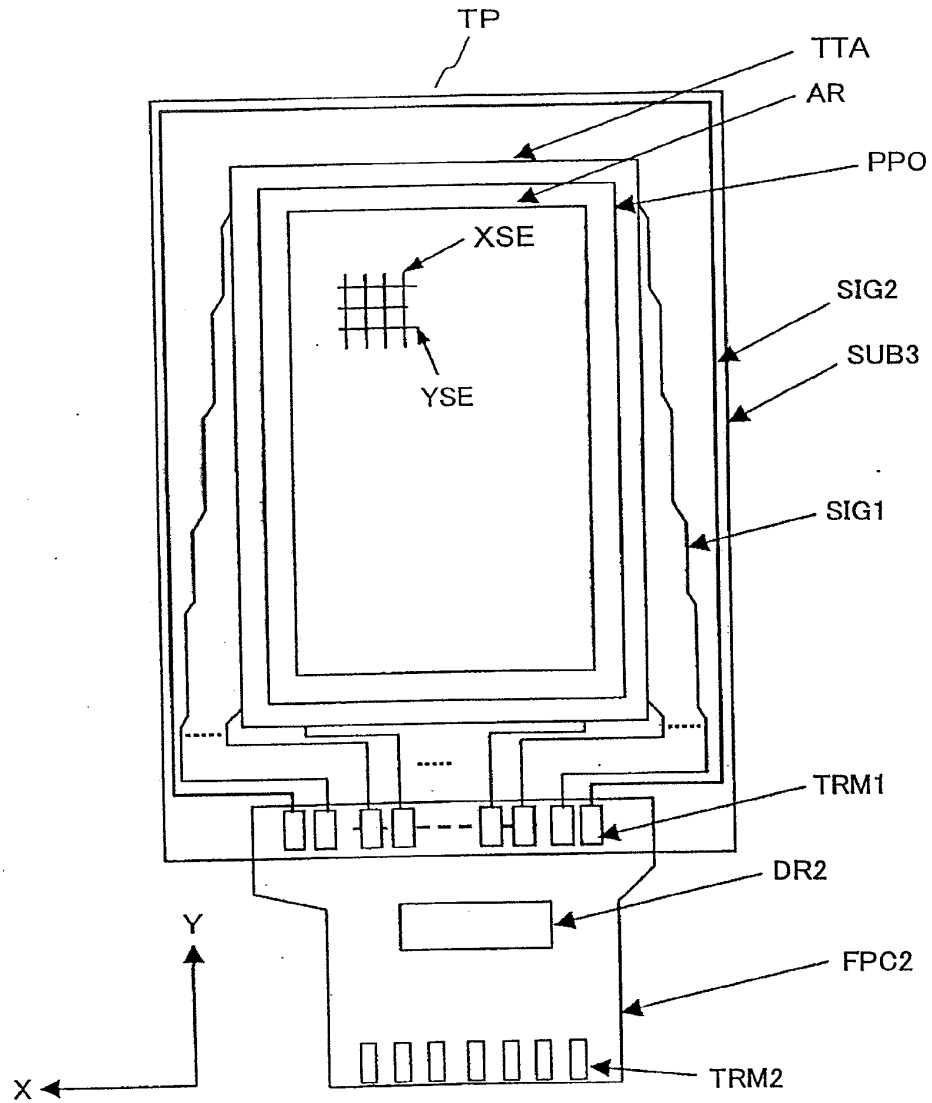


FIG. 4

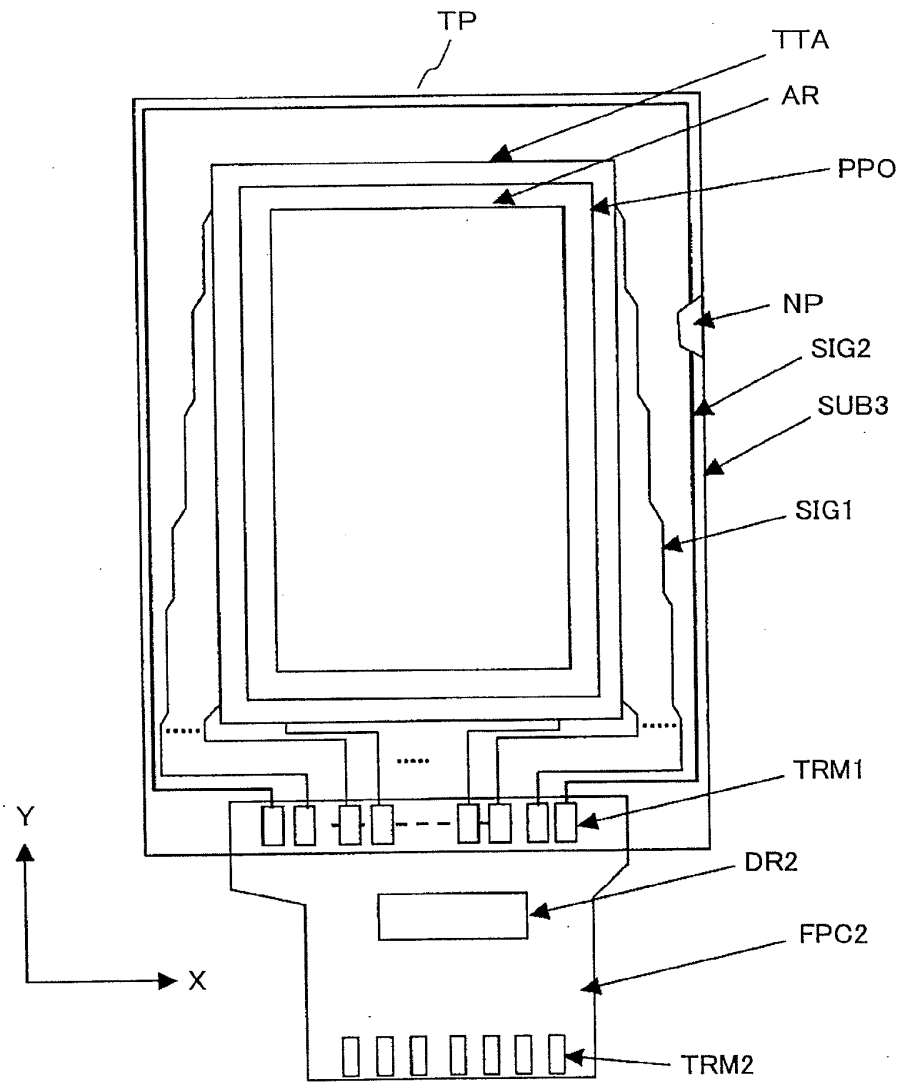


FIG. 5

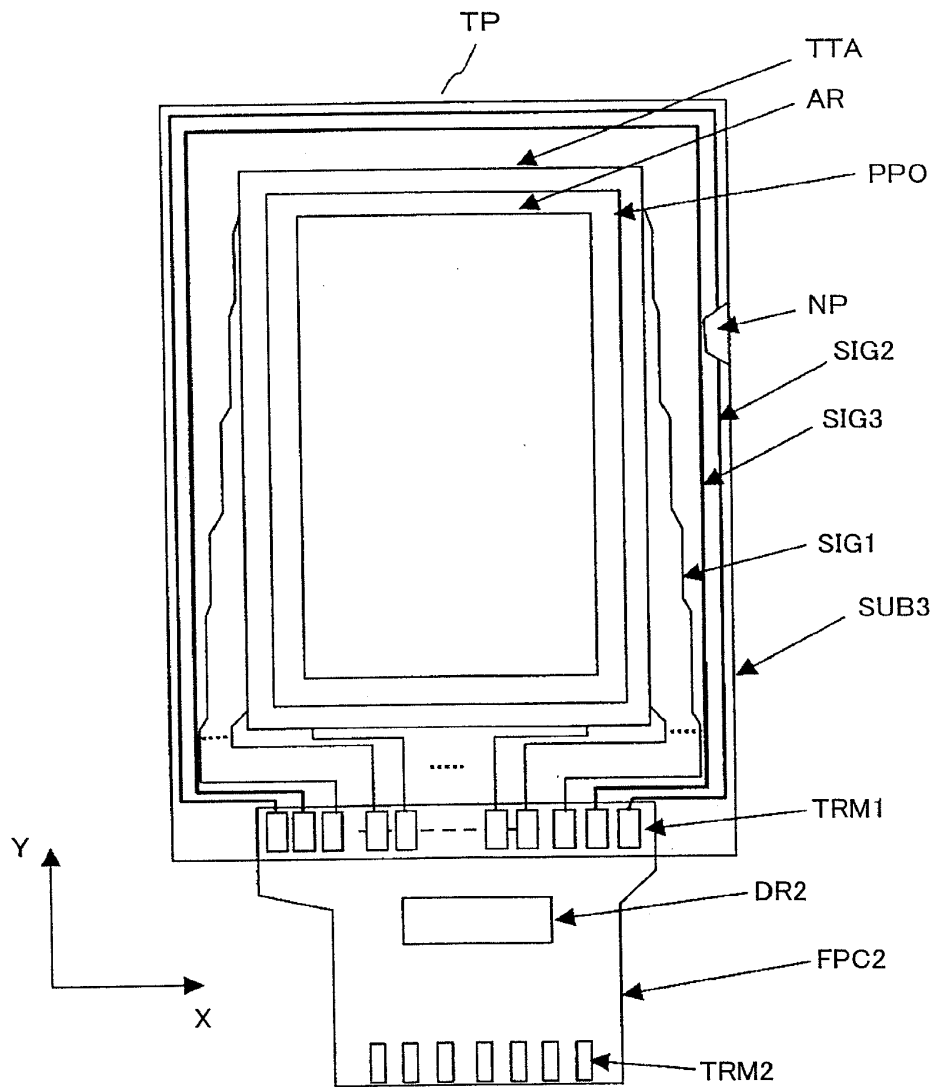


FIG. 6

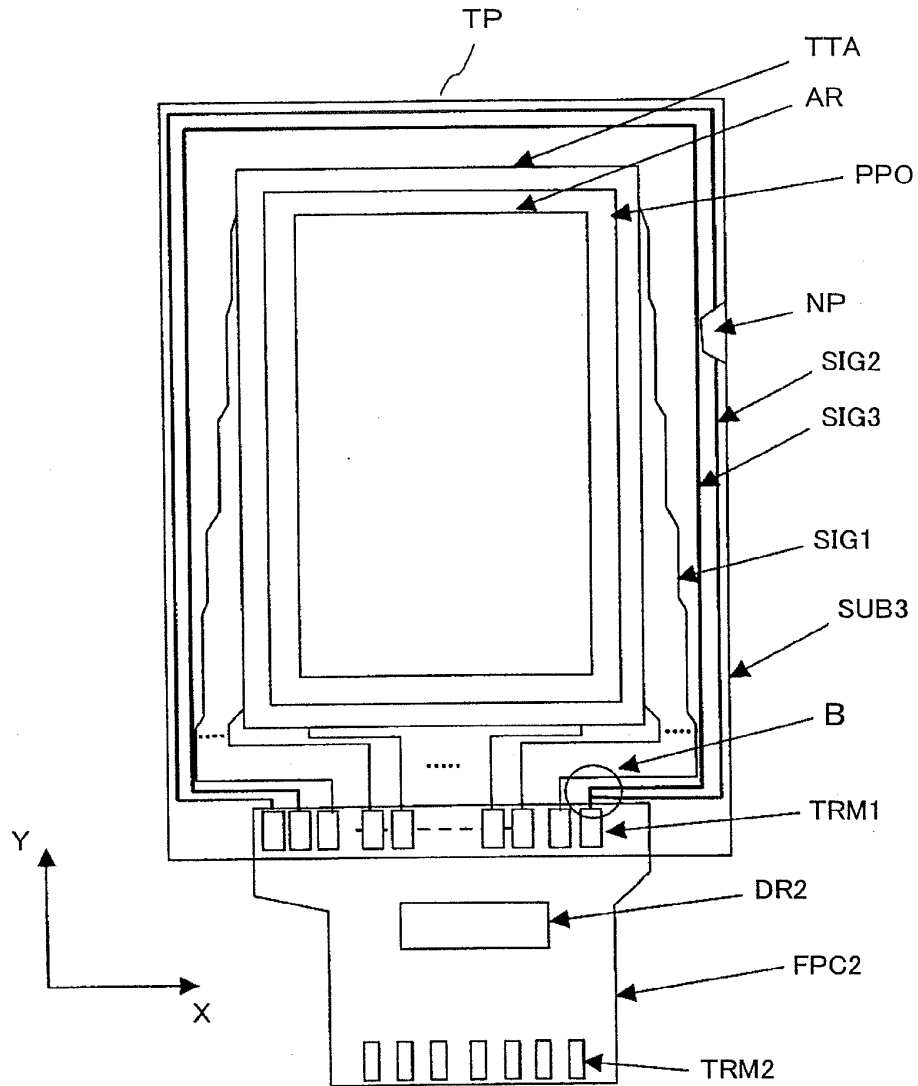
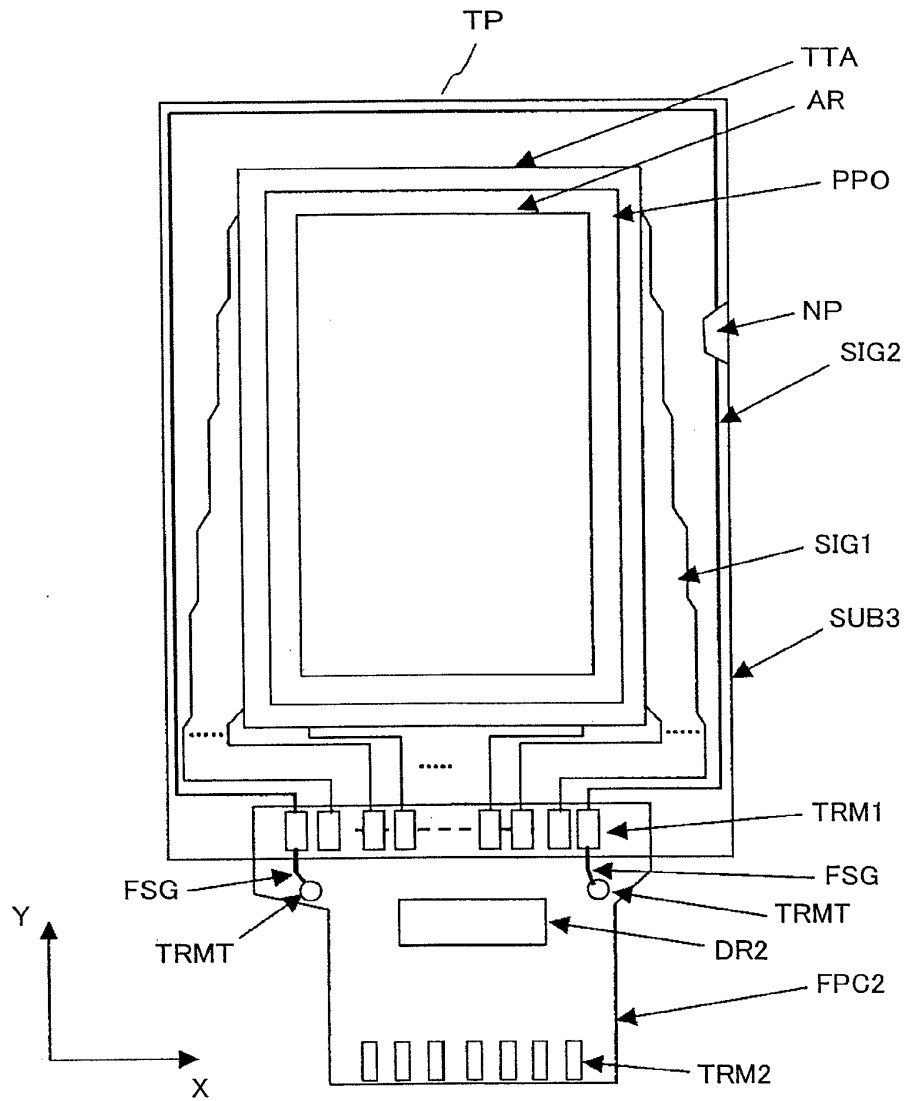


FIG. 7



7/8

FIG. 8

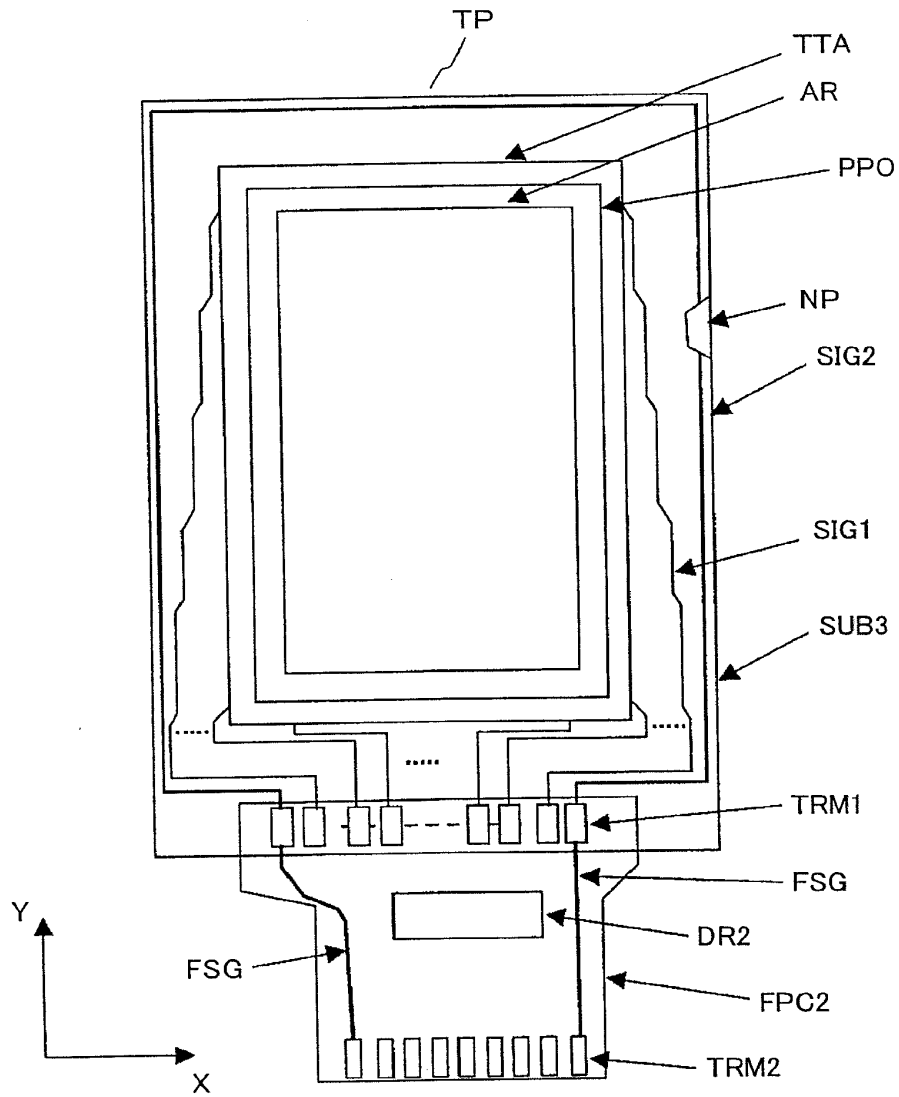
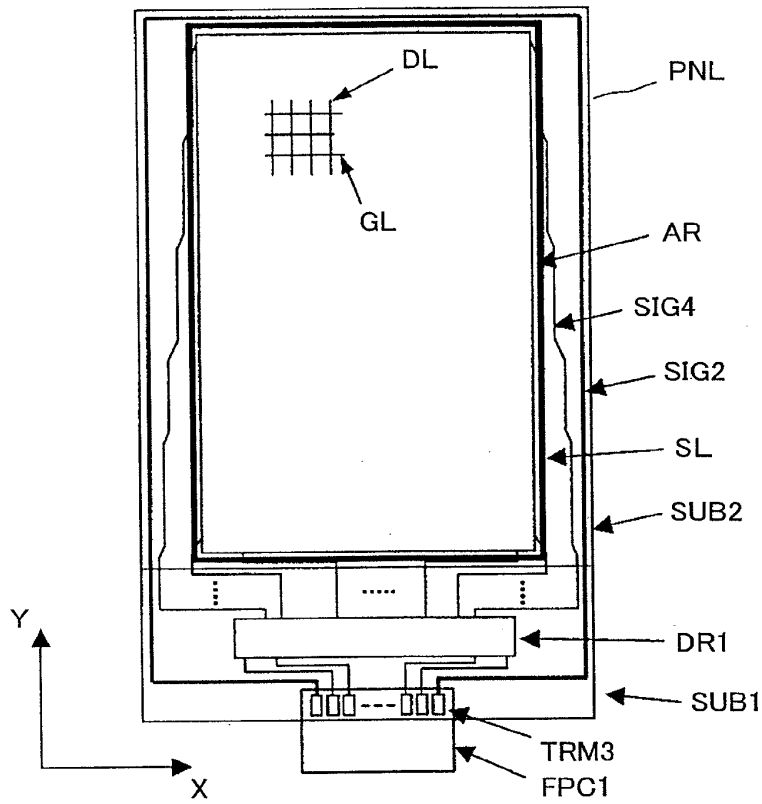


FIG. 9



IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re Application of:	Kouichi ANNO et al.	Confirmation No.:	Not yet assigned
Application No.:	Not yet assigned	Examiner:	Not yet assigned
Filed:	Filed with new application	Group Art Unit:	Not yet assigned

For: DISPLAY DEVICE

Commissioner for Patents
Alexandria, VA 22313-1450

PRELIMINARY AMENDMENT

Dear Sir:

Prior to examination on the merits, please amend the above-identified application as follows:

AMENDMENT TO THE SPECIFICATION	2
REMARKS	3

AMENDMENT TO THE SPECIFICATION

A mark-up version of the specification is attached herewith the preliminary amendment.

CROSS-REFERENCE TO RELATED APPLICATIONS

This application is a Continuation of U.S. Patent Application Serial No. 14/254,926, filed on April 17, 2014, which, in turn ~~This application~~ is a Continuation of U.S. Patent Application Serial No. 13/151,362 (now U.S. Patent No. 8,704,762), filed on April 22, 2015, which claims the priority from Japanese Patent Application No. 2010-126877 filed on June 02, 2010 in the Japanese Patent Office, the entire contents of which are incorporated herein by reference.

REMARKS

Applicant respectfully requests the above amendments be entered in the instant application prior to examination. No new matter is added.

Applicant believes no fee is due with this amendment. However, if a fee is due, please charge our Deposit Account No. 506785, under Docket No. 0520-51700CX1CON from which the undersigned is authorized to draw.

Respectfully submitted,
TYPHA IP LLC

/Arimi Yamada/

Arimi Yamada
Registration No. 70,156

Customer No.: 133303
1875 I STREET NW SUITE 523
WASHINGTON, DC 20006
TEL: (202)-800-8679
FAX: (202)-654-5728
Dated: January 25, 2016

INFORMATION DISCLOSURE STATEMENT BY APPLICANT (Not for submission under 37 CFR 1.99)	Application Number		
	Filing Date		
	First Named Inventor	Kouichi ANNO et al.	
	Art Unit		
	Examiner Name		
	Attorney Docket Number	0520-51700CX1CON	

U.S.PATENTS						
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	8482301	B2	2013-07-09	Takashi KURASHIMA	
	2	7034442	B2	2006-04-25	Hiroshi HIRAYAMA et al.	
	3	6262579	B1	2001-07-17	DAVID J CHAZAN et al.	
	4	7167154	B2	2007-01-23	Tomohiko SATO et al.	
If you wish to add additional U.S. Patent citation information please click the Add button.						
U.S.PATENT APPLICATION PUBLICATIONS						
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	20080246741	A1	2008-10-09	HINATA	Family of JP2008-276729A
	2	20100134137	A1	2010-06-03	KIDA	Corresponding to WO2008/136153A1

INFORMATION DISCLOSURE STATEMENT BY APPLICANT (Not for submission under 37 CFR 1.99)	Application Number			
	Filing Date			
	First Named Inventor	Kouichi ANNO et al.		
	Art Unit			
	Examiner Name			
	Attorney Docket Number	0520-51700CX1CON		

	3	20090322704	A1	2009-12-31	Kouichi ANNO	
	4	20060038580	A1	2006-02-23	Kenichi HASEGAWA et al.	
	5	20100085320	A1	2010-04-08	Yuka KUWAJIMA et al.	
	6	20080144023	A1	2008-06-19	Yukihiro SHIBATA et al.	

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

FOREIGN PATENT DOCUMENTS								
Examiner Initial*	Cite No	Foreign Document Number ³	Country Code ²	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	2008-276729	JP	A	2008-11-13	EPSON IMAGING DEVICES CORP	with English Abstract, Family of US20080246741A1	☐
	2	2008-136153	WO	A1	2008-11-13	SHARP KABUSHIKI KAISHA	with English Abstract. Corresponding to US20100134137A1	☐
	3	2006038988	JP	A	2006-02-09	SEIKO EPSON CORP	with English Abstract	☐
	4	101620490	CN	A	2010-01-06	HITACHI DISPLAYS LTD		☐
	5	1725064	CN	A	2006-01-25	SEIKO EPSON CORP		☐

INFORMATION DISCLOSURE STATEMENT BY APPLICANT (Not for submission under 37 CFR 1.99)	Application Number		
	Filing Date		
	First Named Inventor	Kouichi ANNO et al.	
	Art Unit		
	Examiner Name		
	Attorney Docket Number	0520-51700CX1CON	

	6	2002-350896	JP	A	2002-12-04	ADVANCED DISPLAY KK		☐
	7	09-080478	JP	A	1997-03-28	Sharp Corp.		☐
	8	07-152043	JP	A	1995-06-16	Fujitsu Ltd.		☐
	9	10-2008-0055248	KR	A	2008-06-19	SAMSUNG ELECTRONICS CO LTD		☐
	10	07-056192	JP	A	1995-03-03	Fujitsu Ltd.		☐
	11	2009-53390	JP	A	2009-03-12	Epson Imaging Devices		☐
	12	2008/136153	WO	A	2008-11-13	Sharp KK.		☐

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

NON-PATENT LITERATURE DOCUMENTS

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	Office Action dated June 23, 2015 regarding a corresponding Japanese Patent Application No. 2014-066102	☒
	2	Translation of Office Action in connection with corresponding Chinese Application No. 2011101531803, dated August 01, 2013	☒

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

INFORMATION DISCLOSURE STATEMENT BY APPLICANT (Not for submission under 37 CFR 1.99)	Application Number		
	Filing Date		
	First Named Inventor	Kouichi ANNO et al.	
	Art Unit		
	Examiner Name		
	Attorney Docket Number	0520-51700CX1CON	

EXAMINER SIGNATURE			
Examiner Signature		Date Considered	
<p>*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.</p>			
<p>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.</p>			

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

Application Number	
Filing Date	
First Named Inventor	Kouichi ANNO et al.
Art Unit	
Examiner Name	
Attorney Docket Number	0520-51700CX1CON

CERTIFICATION STATEMENT

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

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

OR

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

☐ See attached certification statement.

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

☒ A certification statement is not submitted herewith.

SIGNATURE

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

Signature	/Arimi Yamada/	Date (YYYY-MM-DD)	2016-01-25
Name/Print	Arimi Yamada	Registration Number	70156

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.

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

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

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re Application of:	Kouichi ANNO et al.	Confirmation No.:	Not yet assigned
Application No.:	Not yet assigned	Examiner:	Not yet assigned
Filed:	Filed with new application	Group Art Unit:	Not yet assigned

For: DISPLAY DEVICE

Commissioner for Patents
Alexandria, VA 22313-1450

INFORMATION DISCLOSURE STATEMENT

Dear Sir:

This subject Information Disclosure Statement is submitted in connection with applicant's continuing duty of disclosure under 37 C.F.R. §1.56.

This Information Disclosure Statement (IDS) is submitted before the mailing of a first office action on the merits.

The relevant documents are listed on the attached Form PTO/SB/08a. Copies of non-U.S. references should be available in the parent file. Thus, they are not concurrently submitted with this IDS.

The filing of this information disclosure statement shall not be construed as a representation that a search has been made, or an admission that the information cited is, or is considered to be, material to patentability, or that the information is analogous to the subject matter of the present invention, or that no other material information exists. Further, the filing of this information disclosure statement shall not be construed as an admission against interest in any manner. Written notification that the enclosed references have been considered in their entirety by return of a copy of the enclosed form, completed by the Examiner, is respectfully requested.

Please charge any shortage in fee due in connection with the filing of this paper to deposit account No. 506785.

Attorney Docket No.: 0520-51700CX1CON
Application No.: Not yet assigned

Patent

Respectfully submitted,
TYPHA IP LLC

/Arimi Yamada/

Arimi Yamada
Registration No. 70,156

Customer No.: 133303
1875 I STREET NW SUITE 523
WASHINGTON, DC 20006
TEL: (202)-800-8679
FAX: (202)-654-5728
Dated: January 25, 2016

STATEMENT UNDER 37 CFR 3.73(c)

Applicant/Patent Owner: Japan Display Inc.

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

Titled: DISPLAY DEVICE

Japan Display Inc., 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:

Panasonic Liquid Crystal Display Co., Ltd.

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: ANNO et al. To: HITACHI DISPLAYS, LTD.

The document was recorded in the United States Patent and Trademark Office at
Reel 026626, Frame 0830, or for which a copy thereof is attached.

2. From: HITACHI DISPLAYS, LTD. To: JAPAN DISPLAY EAST, INC.

The document was recorded in the United States Patent and Trademark Office at
Reel 031980, Frame 0316, or for which a copy thereof is attached.

[Page 1 of 2]

This collection of information is required by 37 CFR 3.73(b). The information is required to obtain or retain a benefit by the public which is to file (and by the USPTO to process) an application. Confidentiality is governed by 35 U.S.C. 122 and 37 CFR 1.11 and 1.14. This collection is estimated to take 12 minutes to complete, including gathering, preparing, and submitting the completed application form to the USPTO. Time will vary depending upon the individual case. Any comments on the amount of time you require to complete this form and/or suggestions for reducing this burden, should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, U.S. Department of Commerce, P.O. Box 1450, Alexandria, VA 22313-1450. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. **SEND TO: Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450.**

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

STATEMENT UNDER 37 CFR 3.73(c)3. From: JAPAN DISPLAY EAST, INC. To: JAPAN DISPLAY INC.

The document was recorded in the United States Patent and Trademark Office at
 Reel 031997, Frame 0245, or for which a copy thereof is attached.

4. 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.

5. 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.

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.

/Arimi Yamada/

2016-01-25

Signature

Date

Arimi Yamada

70156

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.

STATEMENT UNDER 37 CFR 3.73(c)

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

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

Titled: DISPLAY DEVICE

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:

Japan Display Inc.

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 026626, Frame 0830, 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: _____ To: _____

The document was recorded in the United States Patent and Trademark Office at

Reel _____, Frame _____, or for which a copy thereof is attached.

2. 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.

[Page 1 of 2]

This collection of information is required by 37 CFR 3.73(b). The information is required to obtain or retain a benefit by the public which is to file (and by the USPTO to process) an application. Confidentiality is governed by 35 U.S.C. 122 and 37 CFR 1.11 and 1.14. This collection is estimated to take 12 minutes to complete, including gathering, preparing, and submitting the completed application form to the USPTO. Time will vary depending upon the individual case. Any comments on the amount of time you require to complete this form and/or suggestions for reducing this burden, should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, U.S. Department of Commerce, P.O. Box 1450, Alexandria, VA 22313-1450. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. **SEND TO: Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450.**

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

STATEMENT UNDER 37 CFR 3.73(c)

3. 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.

4. 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.

5. 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.

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.

/Arimi Yamada/

2016-01-25

Signature

Date

Arimi Yamada

70156

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.

POWER OF ATTORNEY TO PROSECUTE APPLICATIONS BEFORE THE USPTO

I hereby revoke all previous powers of attorney given in the application identified in the attached statement under 37 C.F.R. §3.73(c).

I hereby appoint practitioners associated with Customer Number: **133303**

TYPHA IP LLC

1875 I Street NW Suite 523

Washington DC 20006

Email: typha_japan@typhaip.com

as attorney(s) or agent(s) to represent the undersigned before the United States Patent and Trademark Office (USPTO) in connection with any and all patent applications assigned only to the undersigned according to the USPTO assignment records or assignment documents attached to this form in accordance with 37 C.F.R. §3.73(c).

Please change the correspondence address for the application identified in the attached statement under 37 C.F.R. §3.73(c) to the address associated with Customer Number: **133303**

Legal Name and Address of Assignee:	
Name:	Japan Display Inc.
Address:	3-7-1, Nishi-shinbashi, Minato-ku, Tokyo 1050003, Japan

Note-A copy of this form, together with a statement under 37 C.F.R. §3.73(c) is required to be filed in each application in which this form is used. The statement under 37 C.F.R. §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 are supplied below is authorized to act on behalf of the assignee:	
Signature: 	Date: January 6, 2016
Name: Hiroyuki YOSHIDA	Telephone: +81-3-6782-8368
Title: Senior General Manager, Intellectual Property Dept., Japan Display Inc.	

申請データシート(37 CFR 1.76)を使った実用及び意匠登録出願宣言書(37 CFR 1.63)

DECLARATION (37 CFR 1.63) FOR UTILITY OR DESIGN APPLICATION

USING AN APPLICATION DATA SHEET (37 CFR 1.76)

発明の名称

Title of Invention

DISPLAY DEVICE

下記発明者である私は、つぎのことがらを宣言します。

As the below named inventor, I hereby declare that:

本宣言は

This declaration is directed to:



添付されている、あるいは

The attached application, or

に、米国出願あるいは PCT 国際出願番号として出願されているものに



宛てられています。

United States application or PCT international application

number 14/254926 fled on April 17, 2014 .

上記の出願は私自身、あるいは私が権限を譲与したものによって行われたものです。

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

私は本出願書中にあらわれるもとの発明者、あるいはもとの共同発明者です。

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

私は本宣言書において故意に虚偽の申し立てを行った場合は 18 U.S.C. 1001 により、罰金あるいは最高五(5)年の禁固刑、あるいはその両方による罰則の対象となることを認めます。

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.

私は、特許請求の範囲を含む上記の明細書を確認し内容を理解しています。

I have reviewed and understand the contents of the above-identified application, including the claims.

私は、連邦規則法典第 37 編規則 1.56 に定義されている、特許性について重要な情報を開示する義務があることを認めます。

I acknowledge the duty to disclose information which is material to patentability as defined in Title 37, Code of Federal Regulations, Section 1.56.

発明者の正式氏名:

LEGAL NAME OF INVENTOR:

Kouichi ANNO

署名:

Signature:

Kouichi Anno

口付(任意):

Date (Optional):

備考: 出願データシート(PTO/AIA/14 あるいはその同等用紙)は、発明の自主独立体全体の命名を含め、本用紙に添付すること。なお残余の発明者ごとにこの用紙の写しを使用する。

Note: An application data sheet (PTO/AIA/14 or equivalent), including naming the entire inventive entity, must accompany this form. Use an additional copy of the present form for each additional inventor.

申請データシート(37 CFR 1.76)を使った実用及び意匠登録出願宣言書(37 CFR 1.63) DECLARATION (37 CFR 1.63) FOR UTILITY OR DESIGN APPLICATION USING AN APPLICATION DATA SHEET (37 CFR 1.76)	
発明の名称 Title of Invention	DISPLAY DEVICE
<p>下記発明者である私は、つぎのことがらを宣言します。 As the below named inventor, I hereby declare that:</p> <p>本宣言は This declaration is directed to:</p> <p>☐ 添付されている、あるいは The attached application, or</p> <p>_____に、米国出願あるいは PCT 国際出願番号 _____として出願されているものに ☒ 宛てられています。 United States application or PCT international application number <u>14/254926</u> filed on <u>April 17, 2014</u>.</p> <p>上記の出願は私自身、あるいは私が権限を譲与したものによって行われたものです。 The above-identified application was made or authorized to be made by me.</p> <p>私は本出願書中にあらわれるもとの発明者、あるいはもとの共同発明者です。 I believe that I am the original inventor or an original joint inventor of a claimed invention in the application.</p> <p>私は本宣言書において故意に虚偽の申し立てを行った場合は 18 U.S.C. 1001 により、罰金あるいは最高五(5)年の禁固刑、あるいはその両方による罰則の対象となることを認めます。 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.</p> <p>私は、特許請求の範囲を含む上記の明細書を確認し内容を理解しています。 I have reviewed and understand the contents of the above-identified application, including the claims.</p> <p>私は、連邦規則法典第 37 編規則 1.56 に定義されている、特許性について重要な情報を開示する義務があることを認めます。 I acknowledge the duty to disclose information which is material to patentability as defined in Title 37, Code of Federal Regulations, Section 1.56.</p>	
発明者の正式氏名: LEGAL NAME OF INVENTOR: Masahiro TERAMOTO	
署名: Signature: <i>Masahiro Teramoto</i>	日付(任意): Date (Optional):
備考: 出願データシート(PTO/AIA/14 あるいはその同等用紙)は、発明の自主独立体全体の命名を含め、本用紙に添付すること。 なお残余の発明者ごとにこの用紙の写しを使用する。 Note: An application data sheet (PTO/AIA/14 or equivalent), including naming the entire inventive entity, must accompany this form. Use an additional copy of the present form for each additional inventor.	

Doc code: Oath
Document Description: Oath or declaration filed

PTO/AIA/02 (07-13)
Approved for use through 01/31/2014. OVB 0651-0032
U.S. Patent and Trademark Office, U.S. DEPARTMENT OF COMMERCE

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

**SUBSTITUTE STATEMENT IN LIEU OF AN OATH OR DECLARATION FOR UTILITY
OR DESIGN PATENT APPLICATION (35 U.S.C. 115(d) AND 37 CFR 1.64)**

Title of Invention	DISPLAY DEVICE		
This statement is directed to:			
☐ The attached application,			
OR			
☒ United States application or PCT international application number <u>14/254926</u> filed on <u>April 17, 2014</u>			
LEGAL NAME of inventor to whom this substitute statement applies:			
(E.g., Given Name (first and middle (if any)) and Family Name or Surname)			
Takumi SATO			
Residence (except for a deceased or legally incapacitated inventor):			
City	Mobara	State	Country Japan
Mailing Address (except for a deceased or legally incapacitated inventor):			
c/o Japan Display Inc., 3-7-1, Nishi-Shinbashi Minato-ku			
City	Tokyo	State	Zip 105-0003 Country Japan
I believe the above-named inventor or joint inventor to be the original inventor or an original joint inventor of a claimed invention in the application.			
The above-identified application was made or authorized to be made by me.			
I hereby acknowledge that any willful false statement made in this statement is punishable under 18 U.S.C. 1001 by fine or imprisonment of not more than five (5) years, or both.			
Relationship to the inventor to whom this substitute statement applies:			
☐ Legal Representative (for deceased or legally incapacitated inventor only),			
☒ Assignee,			
☐ Person to whom the inventor is under an obligation to assign,			
☐ Person who otherwise shows a sufficient proprietary interest in the matter (petition under 37 CFR 1.46 is required), or			
☐ Joint Inventor.			

[Page 1 of 2]

This collection of information is required by 35 U.S.C. 115 and 37 CFR 1.63. The information is required to obtain or retain a benefit by the public which is to file (and by the USPTO to process) an application. Confidentiality is governed by 35 U.S.C. 122 and 37 CFR 1.11 and 1.14. This collection is estimated to take 1 minute to complete, including gathering, preparing, and submitting the completed application form to the USPTO. Time will vary depending upon the individual case. Any comments on the amount of time you require to complete this form and/or suggestions for reducing this burden, should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, U.S. Department of Commerce, P.O. Box 1450, Alexandria, VA 22313-1450. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. SEND TO: Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450.

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

SUBSTITUTE STATEMENT

Circumstances permitting execution of this substitute statement:

- ☐ Inventor is deceased,
☐ Inventor is under legal incapacity,
☒ Inventor cannot be found or reached after diligent effort, or
☐ Inventor has refused to execute the oath or declaration under 37 CFR 1.63.

If there are joint inventors, please check the appropriate box below:

- ☒ An application data sheet under 37 CFR 1.76 (PTO/AIA/14 or equivalent) naming the entire inventive entity has been or is currently submitted.

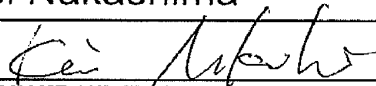
OR

- ☐ An application data sheet under 37 CFR 1.76 (PTO/AIA/14 or equivalent) has not been submitted. Thus, a Substitute Statement Supplemental Sheet (PTO/AIA/11 or equivalent) naming the entire inventive entity and providing inventor information is attached. See 37 CFR 1.64(b).

WARNING:

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

PERSON EXECUTING THIS SUBSTITUTE STATEMENT:

Name: Kei Nakashima		Date (Optional):	
Signature: 			
APPLICANT NAME AND TITLE OF PERSON EXECUTING THIS SUBSTITUTE STATEMENT:			
If the applicant is a juristic entity, list the applicant name and the title of the signer:			
Applicant Name: Japan Display Inc.			
Title of Person Executing This Substitute Statement: Group Manager			
The signer, whose title is supplied above, is authorized to act on behalf of the applicant.			
Residence of the signer (unless provided in an application data sheet, PTO/AIA/14 or equivalent):			
City	State	Country	
Mailing Address of the signer (unless provided in an application data sheet, PTO/AIA/14 or equivalent)			
City	State	Zip	Country
Note: Use an additional PTO/AIA/02 form for each inventor who is deceased, legally incapacitated, cannot be found or reached after diligent effort, or has refused to execute the oath or declaration under 37 CFR 1.63.			

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.

**SUBSTITUTE STATEMENT IN LIEU OF AN OATH OR DECLARATION FOR UTILITY
OR DESIGN PATENT APPLICATION (35 U.S.C. 115(d) AND 37 CFR 1.64)**

Title of Invention	DISPLAY DEVICE		
This statement is directed to:			
☐ The attached application,			
OR			
☒ United States application or PCT international application number <u>14/254926</u> filed on <u>April 17, 2014</u>			
LEGAL NAME of inventor to whom this substitute statement applies:			
(E.g., Given Name (first and middle (if any)) and Family Name or Surname)			
Takumi SATO			
Residence (except for a deceased or legally incapacitated inventor):			
City	Mobara	State	Country Japan
Mailing Address (except for a deceased or legally incapacitated inventor):			
c/o Japan Display Inc., 3-7-1, Nishi-Shinbashi Minato-ku			
City	Tokyo	State	Zip 105-0003 Country Japan
I believe the above-named inventor or joint inventor to be the original inventor or an original joint inventor of a claimed invention in the application.			
The above-identified application was made or authorized to be made by me.			
I hereby acknowledge that any willful false statement made in this statement is punishable under 18 U.S.C. 1001 by fine or imprisonment of not more than five (5) years, or both.			
Relationship to the inventor to whom this substitute statement applies:			
☐ Legal Representative (for deceased or legally incapacitated inventor only),			
☒ Assignee,			
☐ Person to whom the inventor is under an obligation to assign,			
☐ Person who otherwise shows a sufficient proprietary interest in the matter (petition under 37 CFR 1.46 is required), or			
☐ Joint Inventor.			

[Page 1 of 2]

This collection of information is required by 35 U.S.C. 115 and 37 CFR 1.63. The information is required to obtain or retain a benefit by the public which is to file (and by the USPTO to process) an application. Confidentiality is governed by 35 U.S.C. 122 and 37 CFR 1.11 and 1.14. This collection is estimated to take 1 minute to complete, including gathering, preparing, and submitting the completed application form to the USPTO. Time will vary depending upon the individual case. Any comments on the amount of time you require to complete this form and/or suggestions for reducing this burden, should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, U.S. Department of Commerce, P.O. Box 1450, Alexandria, VA 22313-1450. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. SEND TO: Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450.

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

SUBSTITUTE STATEMENT

Circumstances permitting execution of this substitute statement:

- ☐ Inventor is deceased,
☐ Inventor is under legal incapacity,
☒ Inventor cannot be found or reached after diligent effort, or
☐ Inventor has refused to execute the oath or declaration under 37 CFR 1.63.

If there are joint inventors, please check the appropriate box below:

- ☒ An application data sheet under 37 CFR 1.76 (PTO/AIA/14 or equivalent) naming the entire inventive entity has been or is currently submitted.

OR

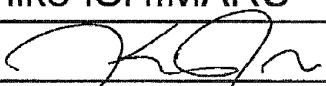
- ☐ An application data sheet under 37 CFR 1.76 (PTO/AIA/14 or equivalent) has not been submitted. Thus, a Substitute Statement Supplemental Sheet (PTO/AIA/11 or equivalent) naming the entire inventive entity and providing inventor information is attached. See 37 CFR 1.64(b).

WARNING:

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

PERSON EXECUTING THIS SUBSTITUTE STATEMENT:

Name: **Kazuhiko ISHIMARU** Date (Optional): **Aug 7, 2014**

Signature: 

APPLICANT NAME AND TITLE OF PERSON EXECUTING THIS SUBSTITUTE STATEMENT:

If the applicant is a juristic entity, list the applicant name and the title of the signer:

Applicant Name: **Panasonic Liquid Crystal Display Co. Ltd.**

Title of Person Executing This Substitute Statement: **Manager**

The signer, whose title is supplied above, is authorized to act on behalf of the applicant.

Residence of the signer (unless provided in an application data sheet, PTO/AIA/14 or equivalent):

City	State	Country
------	-------	---------

Mailing Address of the signer (unless provided in an application data sheet, PTO/AIA/14 or equivalent)

--	--	--

City	State	Zip	Country
------	-------	-----	---------

Note: Use an additional PTO/AIA/02 form for each inventor who is deceased, legally incapacitated, cannot be found or reached after diligent effort, or has refused to execute the oath or declaration under 37 CFR 1.63.

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

PATENT APPLICATION FEE DETERMINATION RECORD Substitute for Form PTO-875				Application or Docket Number 15/005,737		Filing Date 01/25/2016		☐ To be Mailed	
---	--	--	--	---	--	----------------------------------	--	---------------------------------------	--

ENTITY: ☒ **LARGE** ☐ **SMALL** ☐ **MICRO**

APPLICATION AS FILED – PART I

FOR	NUMBER FILED (Column 1)	NUMBER EXTRA (Column 2)		RATE (\$)	FEE (\$)
☐ BASIC FEE (37 CFR 1.16(a), (b), or (c))	N/A	N/A		N/A	
☐ SEARCH FEE (37 CFR 1.16(k), (i), or (m))	N/A	N/A		N/A	
☐ EXAMINATION FEE (37 CFR 1.16(o), (p), or (q))	N/A	N/A		N/A	
TOTAL CLAIMS (37 CFR 1.16(j))	minus 20 =	*		X \$ =	
INDEPENDENT CLAIMS (37 CFR 1.16(h))	minus 3 =	*		X \$ =	
☐ APPLICATION SIZE FEE (37 CFR 1.16(s))	If the specification and drawings exceed 100 sheets of paper, the application size fee due is \$310 (\$155 for small entity) for each additional 50 sheets or fraction thereof. See 35 U.S.C. 41(a)(1)(G) and 37 CFR 1.16(s).				
☐ MULTIPLE DEPENDENT CLAIM PRESENT (37 CFR 1.16(j))					
* If the difference in column 1 is less than zero, enter "0" in column 2.				TOTAL	

APPLICATION AS AMENDED – PART II

	(Column 1)	(Column 2)	(Column 3)		RATE (\$)	ADDITIONAL FEE (\$)
AMENDMENT	01/25/2016	CLAIMS REMAINING AFTER AMENDMENT	HIGHEST NUMBER PREVIOUSLY PAID FOR	PRESENT EXTRA		
	Total (37 CFR 1.16(i))	* 19	Minus	** 20	= 0	x \$80 = 0
	Independent (37 CFR 1.16(h))	* 2	Minus	*** 3	= 0	x \$420 = 0
	☐ Application Size Fee (37 CFR 1.16(s))					
	☐ FIRST PRESENTATION OF MULTIPLE DEPENDENT CLAIM (37 CFR 1.16(j))					
					TOTAL ADD'L FEE	0

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

* If the entry in column 1 is less than the entry in column 2, write "0" in column 3.
 ** If the "Highest Number Previously Paid For" IN THIS SPACE is less than 20, enter "20".
 *** If the "Highest Number Previously Paid For" IN THIS SPACE is less than 3, enter "3".
 The "Highest Number Previously Paid For" (Total or Independent) is the highest number found in the appropriate box in column 1.

LIE
KIMBERLY PANNELL

This collection of information is required by 37 CFR 1.16. The information is required to obtain or retain a benefit by the public which is to file (and by the USPTO to process) an application. Confidentiality is governed by 35 U.S.C. 122 and 37 CFR 1.14. This collection is estimated to take 12 minutes to complete, including gathering, preparing, and submitting the completed application form to the USPTO. Time will vary depending upon the individual case. Any comments on the amount of time you require to complete this form and/or suggestions for reducing this burden, should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, U.S. Department of Commerce, P.O. Box 1450, Alexandria, VA 22313-1450. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. **SEND TO: Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450.**

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



UNITED STATES PATENT AND TRADEMARK OFFICE

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

APPLICATION NUMBER	FILING or 371(c) DATE	GRP ART UNIT	FIL FEE REC'D	ATTY. DOCKET NO.	TOT CLAIMS	IND CLAIMS
15/005,737	01/25/2016	2871	1600	0520-51700CX1CON	19	2

CONFIRMATION NO. 7062

FILING RECEIPT



0000000080453239

133303
TYPHA IP LLC
1875 I Street NW Suite 523
Washington, DC 20006

Date Mailed: 02/11/2016

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)

Kouichi ANNO, Mobara, JAPAN;
Takumi SATO, Mobara, JAPAN;
Masahiro TERAMOTO, Mobara, JAPAN;

Applicant(s)

Japan Display Inc., Tokyo, JAPAN;
Panasonic Liquid Crystal Display Co. Ltd., Hyogo-ken, JAPAN;

Power of Attorney: None

Domestic Priority data as claimed by applicant

This application is a CON of 14/254,926 04/17/2014
which is a CON of 13/151,362 06/02/2011 PAT 8704762

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 2010-126877 06/02/2010

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.

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

If Required, Foreign Filing License Granted: 02/09/2016

The country code and number of your priority application, to be used for filing abroad under the Paris Convention, is **US 15/005,737**

Projected Publication Date: 05/19/2016

Non-Publication Request: No

Early Publication Request: No

Title

DISPLAY DEVICE

Preliminary Class

349

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

page 2 of 4

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 Assets Control, 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).

SelectUSA

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

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

PATENT APPLICATION FEE DETERMINATION RECORD Substitute for Form PTO-875						Application or Docket Number 15/005,737	
APPLICATION AS FILED - PART I							
(Column 1)		(Column 2)		SMALL ENTITY		OTHER THAN SMALL ENTITY	
FOR	NUMBER FILED	NUMBER EXTRA	RATE(\$)	FEE(\$)		RATE(\$)	FEE(\$)
BASIC FEE (37 CFR 1.16(a), (b), or (c))	N/A	N/A	N/A			N/A	280
SEARCH FEE (37 CFR 1.16(k), (l), or (m))	N/A	N/A	N/A			N/A	600
EXAMINATION FEE (37 CFR 1.16(o), (p), or (q))	N/A	N/A	N/A			N/A	720
TOTAL CLAIMS (37 CFR 1.16(i))	19	minus 20 = *				x 80 =	0.00
INDEPENDENT CLAIMS (37 CFR 1.16(h))	2	minus 3 = *				x 420 =	0.00
APPLICATION SIZE FEE (37 CFR 1.16(s))	If the specification and drawings exceed 100 sheets of paper, the application size fee due is \$310 (\$155 for small entity) for each additional 50 sheets or fraction thereof. See 35 U.S.C. 41(a)(1)(G) and 37 CFR 1.16(s).						0.00
MULTIPLE DEPENDENT CLAIM PRESENT (37 CFR 1.16(j))							0.00
* If the difference in column 1 is less than zero, enter "0" in column 2.			TOTAL			TOTAL	1600
APPLICATION AS AMENDED - PART II							
(Column 1)		(Column 2)		(Column 3)		SMALL ENTITY	
AMENDMENT A	CLAIMS REMAINING AFTER AMENDMENT	HIGHEST NUMBER PREVIOUSLY PAID FOR	PRESENT EXTRA	RATE(\$)	ADDITIONAL FEE(\$)		RATE(\$)
	Total (37 CFR 1.16(i))	*	Minus **	=	x =		x =
	Independent (37 CFR 1.16(h))	*	Minus ***	=	x =		x =
	Application Size Fee (37 CFR 1.16(s))						
	FIRST PRESENTATION OF MULTIPLE DEPENDENT CLAIM (37 CFR 1.16(j))						
			TOTAL ADD'L FEE			TOTAL ADD'L FEE	
(Column 1)		(Column 2)		(Column 3)		SMALL ENTITY	
AMENDMENT B	CLAIMS REMAINING AFTER AMENDMENT	HIGHEST NUMBER PREVIOUSLY PAID FOR	PRESENT EXTRA	RATE(\$)	ADDITIONAL FEE(\$)		RATE(\$)
	Total (37 CFR 1.16(i))	*	Minus **	=	x =		x =
	Independent (37 CFR 1.16(h))	*	Minus ***	=	x =		x =
	Application Size Fee (37 CFR 1.16(s))						
	FIRST PRESENTATION OF MULTIPLE DEPENDENT CLAIM (37 CFR 1.16(j))						
			TOTAL ADD'L FEE			TOTAL ADD'L FEE	
* If the entry in column 1 is less than the entry in column 2, write "0" in column 3. ** If the "Highest Number Previously Paid For" IN THIS SPACE is less than 20, enter "20". *** If the "Highest Number Previously Paid For" IN THIS SPACE is less than 3, enter "3". The "Highest Number Previously Paid For" (Total or Independent) is the highest found in the appropriate box in column 1.							



UNITED STATES PATENT AND TRADEMARK OFFICE

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

APPLICATION NUMBER	FILING OR 371(C) DATE	FIRST NAMED APPLICANT	ATTY. DOCKET NO./TITLE
15/005,737	01/25/2016	Kouichi ANNO	0520-51700CX1CON

133303
TYPHA IP LLC
1875 I Street NW Suite 523
Washington, DC 20006

CONFIRMATION NO. 7062
IMPROPER CPOA LETTER



Date Mailed: 02/11/2016

NOTICE REGARDING POWER OF ATTORNEY

This is in response to the power of attorney filed 01/25/2016. The power of attorney in this application is not accepted for the reason(s) listed below:

- The revocation is not signed by the applicant, the assignee of the entire interest, or one particular principal attorney having the authority to revoke.

/pluangvitham/

Office of Data Management, Application Assistance Unit (571) 272-4000, or (571) 272-4200, or 1-888-786-0101

POWER OF ATTORNEY TO PROSECUTE APPLICATIONS BEFORE THE USPTO

I hereby revoke all previous powers of attorney given in the application identified in the attached statement under 37 C.F.R. §3.73(c).

I hereby appoint practitioners associated with Customer Number: **133303**

TYPHA IP LLC

1875 I Street NW Suite 523

Washington DC 20006

Email: typha_japan@typhaip.com

as attorney(s) or agent(s) to represent the undersigned before the United States Patent and Trademark Office (USPTO) in connection with any and all patent applications assigned only to the undersigned according to the USPTO assignment records or assignment documents attached to this form in accordance with 37 C.F.R. §3.73(c).

Please change the correspondence address for the application identified in the attached statement under 37 C.F.R. §3.73(c) to the address associated with Customer Number: **133303**

Legal Name and Address of Assignee:	
Name:	Japan Display Inc.
Address:	3-7-1, Nishi-shinbashi, Minato-ku, Tokyo 1050003, Japan

Note-A copy of this form, together with a statement under 37 C.F.R. §3.73(c) is required to be filed in each application in which this form is used. The statement under 37 C.F.R. §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 are supplied below is authorized to act on behalf of the assignee:	
Signature: 	Date: January 6, 2016
Name: Hiroyuki YOSHIDA	Telephone: +81-3-6782-8368
Title: Senior General Manager, Intellectual Property Dept., Japan Display Inc.	

POWER OF ATTORNEY TO PROSECUTE APPLICATIONS BEFORE THE USPTO

I hereby revoke all previous powers of attorney given in the application identified in the attached statement under 37 C.F.R. §3.73(c).

I hereby appoint practitioners associated with Customer Number: **133303**

TYPHA IP LLC

Email: TYPHA_IP@typhaip.com

Fax: 202-654-5728

as attorney(s) or agent(s) to represent the undersigned before the United States Patent and Trademark Office (USPTO) in connection with any and all patent applications assigned only to the undersigned according to the USPTO assignment records or assignment documents attached to this form in accordance with 37 C.F.R. §3.73(c).

Please change the correspondence address for the application identified in the attached statement under 37 C.F.R. §3.73(c) to the address associated with Customer Number: **133303**

Legal Name and Address of Assignee:	
Name:	Panasonic Liquid Crystal Display Co., Ltd.
Address:	1-6, Megahida-cho, Shikama-ku, Himeji-shi, Hyogo 672-8033, Japan

Note-A copy of this form, together with a statement under 37 C.F.R. §3.73(c) is required to be filed in each application in which this form is used. The statement under 37 C.F.R. §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 are supplied below is authorized to act on behalf of the assignee:	
Signature: 	Date: February 16, 2016
Name: Seiji Harada	Telephone: +81-(0)50-3487-3187
Title: Manager, Intellectual Property Dept., Product Development Center	

Electronic Acknowledgement Receipt	
EFS ID:	25039750
Application Number:	15005737
International Application Number:	
Confirmation Number:	7062
Title of Invention:	DISPLAY DEVICE
First Named Inventor/Applicant Name:	Kouichi ANNO
Customer Number:	133303
Filer:	Arimi Yamada
Filer Authorized By:	
Attorney Docket Number:	0520-51700CX1CON
Receipt Date:	26-FEB-2016
Filing Date:	25-JAN-2016
Time Stamp:	18:58:53
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	Assignee showing of ownership per 37 CFR 3.73	0520-51700CX1CON_Pana_373 c_JDI.pdf	121497	no	3
			96a0faadf148284c637c84bd052d2ae33625e581		
Warnings:					
Information:					

2	Assignee showing of ownership per 37 CFR 3.73	0520-51700CX1CON_Pana_373c_PLD.pdf	120628 a99721b8273451bb9192a5a7cd3b55ecd3230c66	no	3
Warnings:					
Information:					
3	Power of Attorney	20160106_POA_JDI.pdf	32742 5795d14efaf6e0ec7a5de35ceff3e86c3324d314	no	1
Warnings:					
Information:					
4	Power of Attorney	20160216_POA_PLD.pdf	28968 ab9448cce3454a7db085110b9504915568fd323c	no	1
Warnings:					
Information:					
Total Files Size (in bytes):			303835		
<p>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.</p> <p><u>New Applications Under 35 U.S.C. 111</u> If a new application is being filed and the application includes the necessary components for a filing date (see 37 CFR 1.53(b)-(d) and MPEP 506), a Filing Receipt (37 CFR 1.54) will be issued in due course and the date shown on this Acknowledgement Receipt will establish the filing date of the application.</p> <p><u>National Stage of an International Application under 35 U.S.C. 371</u> If a timely submission to enter the national stage of an international application is compliant with the conditions of 35 U.S.C. 371 and other applicable requirements a Form PCT/DO/EO/903 indicating acceptance of the application as a national stage submission under 35 U.S.C. 371 will be issued in addition to the Filing Receipt, in due course.</p> <p><u>New International Application Filed with the USPTO as a Receiving Office</u> If a new international application is being filed and the international application includes the necessary components for an international filing date (see PCT Article 11 and MPEP 1810), a Notification of the International Application Number and of the International Filing Date (Form PCT/RO/105) will be issued in due course, subject to prescriptions concerning national security, and the date shown on this Acknowledgement Receipt will establish the international filing date of the application.</p>					

STATEMENT UNDER 37 CFR 3.73(c)

Applicant/Patent Owner: JAPAN DISPLAY INC.

Application No./Patent No.: 15/005,737

Filed/Issue Date: 2016-01-25

Titled: DISPLAY DEVICE

JAPAN DISPLAY INC., 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:

PANASONIC LIQUID CRYSTAL DISPLAY CO., LTD.

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: Kouichi ANNO et al. To: HITACHI DISPLAYS, LTD.

The document was recorded in the United States Patent and Trademark Office at

Reel 026626, Frame 0830, or for which a copy thereof is attached.

2. From: HITACHI DISPLAYS, LTD. To: JAPAN DISPLAY EAST, INC.

The document was recorded in the United States Patent and Trademark Office at

Reel 031980, Frame 0316, or for which a copy thereof is attached.

[Page 1 of 2]

This collection of information is required by 37 CFR 3.73(b). The information is required to obtain or retain a benefit by the public which is to file (and by the USPTO to process) an application. Confidentiality is governed by 35 U.S.C. 122 and 37 CFR 1.11 and 1.14. This collection is estimated to take 12 minutes to complete, including gathering, preparing, and submitting the completed application form to the USPTO. Time will vary depending upon the individual case. Any comments on the amount of time you require to complete this form and/or suggestions for reducing this burden, should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, U.S. Department of Commerce, P.O. Box 1450, Alexandria, VA 22313-1450. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. **SEND TO: Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450.**

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

STATEMENT UNDER 37 CFR 3.73(c)3. From: JAPAN DISPLAY EAST, INC. To: JAPAN DISPLAY INC.

The document was recorded in the United States Patent and Trademark Office at
 Reel 031997, Frame 0245, or for which a copy thereof is attached.

4. 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.

5. 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.

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.

/Arimi Yamada/

2016-02-26

Signature

Date

Arimi Yamada/

70156

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.

STATEMENT UNDER 37 CFR 3.73(c)

Applicant/Patent Owner: PANASONIC LIQUID CRYSTAL DISPLAY CO., LTD.

Application No./Patent No.: 15/005,737 Filed/Issue Date: 2016-01-25

Titled: DISPLAY DEVICE

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:

JAPAN DISPLAY INC.

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 026626, Frame 0830, 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: _____ To: _____
- The document was recorded in the United States Patent and Trademark Office at
Reel _____, Frame _____, or for which a copy thereof is attached.
2. 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.

[Page 1 of 2]

This collection of information is required by 37 CFR 3.73(b). The information is required to obtain or retain a benefit by the public which is to file (and by the USPTO to process) an application. Confidentiality is governed by 35 U.S.C. 122 and 37 CFR 1.11 and 1.14. This collection is estimated to take 12 minutes to complete, including gathering, preparing, and submitting the completed application form to the USPTO. Time will vary depending upon the individual case. Any comments on the amount of time you require to complete this form and/or suggestions for reducing this burden, should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, U.S. Department of Commerce, P.O. Box 1450, Alexandria, VA 22313-1450. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. **SEND TO: Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450.**

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

STATEMENT UNDER 37 CFR 3.73(c)

3. 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.

4. 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.

5. 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.

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.

/Arimi Yamada/

2016-02-26

Signature

Date

Arimi Yamada/

70156

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.



UNITED STATES PATENT AND TRADEMARK OFFICE

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

APPLICATION NUMBER	FILING OR 371(C) DATE	FIRST NAMED APPLICANT	ATTY. DOCKET NO./TITLE
15/005,737	01/25/2016	Kouichi ANNO	0520-51700CX1CON

CONFIRMATION NO. 7062

POA ACCEPTANCE LETTER

133303
TYPHA IP LLC
1819 L Street NW Suite 200
Washington, DC 20036



Date Mailed: 03/10/2016

NOTICE OF ACCEPTANCE OF POWER OF ATTORNEY

This is in response to the Power of Attorney filed 02/26/2016.

The Power of Attorney in this application is accepted. Correspondence in this application will be mailed to the above address as provided by 37 CFR 1.33.

Questions about the contents of this notice and the requirements it sets forth should be directed to the Office of Data Management, Application Assistance Unit, at (571) 272-4000 or (571) 272-4200 or 1-888-786-0101.

/qtran/

日 本 国 特 許 庁
JAPAN PATENT OFFICE

別紙添付の書類に記載されている事項は下記の出願書類に記載されている事項と同一であることを証明する。

This is to certify that the annexed is a true copy of the following application as filed with this Office.

出 願 年 月 日 2 0 1 0 年 6 月 2 日
Date of Application:

出 願 番 号 特 願 2 0 1 0 - 1 2 6 8 7 7
Application Number:

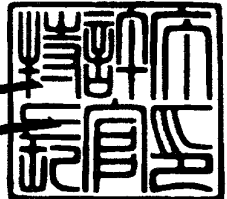
パリ条約による外国への出願
に用いる優先権の主張の基礎
となる出願の国コードと出願
番号
The country code and number
of your priority application,
to be used for filing abroad
under the Paris Convention, is

J P 2 0 1 0 - 1 2 6 8 7 7

出 願 人 株式会社ジャパンディスプレイ
Applicant(s): パナソニック液晶ディスプレイ株式会社

2 0 1 6 年 3 月 1 5 日

特許庁長官
Commissioner,
Japan Patent Office

伊 藤 仁


【書類名】 特許願
【整理番号】 EJP-000460
【あて先】 特許庁長官殿
【国際特許分類】 G02F 1/133
【発明者】
 【住所又は居所】 千葉県茂原市早野3 3 0 0 番地 株式会社日立ディスプレイズ内
 【氏名】 阿武 恒一
【発明者】
 【住所又は居所】 千葉県茂原市早野3 3 0 0 番地 株式会社日立ディスプレイズ内
 【氏名】 佐藤 匠
【発明者】
 【住所又は居所】 千葉県茂原市早野3 3 0 0 番地 株式会社日立ディスプレイズ内
 【氏名】 寺本 雅博
【特許出願人】
 【識別番号】 502356528
 【氏名又は名称】 株式会社 日立ディスプレイズ
【代理人】
 【識別番号】 100075959
 【弁理士】
 【氏名又は名称】 小林 保
 【電話番号】 (03)3865-9755
【手数料の表示】
 【予納台帳番号】 016207
 【納付金額】 15,000円
【提出物件の目録】
 【物件名】 明細書 1
 【物件名】 特許請求の範囲 1
 【物件名】 要約書 1
 【物件名】 図面 1
 【包括委任状番号】 0608506

【書類名】明細書

【発明の名称】表示装置

【技術分野】

【0001】

本発明は、表示装置に係わり、特に、検出部や表示領域の外側領域に形成される信号配線の検査を容易化する技術に関する。

【背景技術】

【0002】

液晶表示パネルは、薄膜トランジスタや画素電極等が形成される第1基板（TFT基板）と、カラーフィルタ等が形成される第2基板（カラーフィルタ基板）とが液晶層を介して対向配置される構成となっている。このような構成からなる液晶表示パネルは、複数枚分の液晶表示装置の回路パターンを形成した第1基板（TFT基板）とカラーフィルタ等を形成した第2基板（カラーフィルタ基板）とが接着され、液晶を封入した後に、液晶表示装置毎にガラス基板を切断することにより形成されている。このために、ガラス基板の切断工程や途中の取り扱いにおいてガラス基板の端部に欠けやクラック等が生じた場合、基板上に形成される信号配線が基板欠けやクラック等と共に断線してしまう配線不良が問題となっている。

【0003】

また、携帯情報端末に搭載される表示装置では、液晶表示パネルの表示面側にタッチパネルと称される座標入力装置が配置され、表示画像と接触位置との情報に基づいた画像の表示制御が一般的となっている。タッチパネルはガラス基板上の検出領域内に電極が形成され、検出領域の周囲には電極に駆動信号を供給する信号配線が形成される構成となっている。このために、液晶表示パネルと同様に、基板欠けやクラック等と共に信号配線が断線してしまう配線不良が問題となっている。

【0004】

このような配線不良を検出する方法として、例えば、特許文献1に記載の液晶表示装置がある。特許文献1に記載の液晶表示装置では、平行配置される共通配線を表示画面の周縁部で互いに接続すると共に、表示画面中央部に開放部を形成することにより、アレイテスタを用いて共通配線の断線を検出可能としている。

【0005】

また、特許文献2には、ゲート線と平行に形成される予備配線を用いて、ドレイン線の短絡を検出する技術が開示されている。さらには、特許文献3には、1枚のガラス基板に複数枚分の液晶表示装置パターンを形成する際に、切断工程において各液晶表示装置に分割する際に、各液晶表示装置から切り離される領域に、各配線を互いに接続するための共通配線を設ける技術が開示されている。

【先行技術文献】

【特許文献】

【0006】

【特許文献1】特開2002-350896号公報

【特許文献2】特開平9-80478号公報

【特許文献3】特開平7-152043号公報

【発明の概要】

【発明が解決しようとする課題】

【0007】

タッチパネルは液晶表示パネルの表示面側に配置され、操作者の入力指示を検出する構成となっているので、検出領域の周囲には遮光膜が配置され、配線領域等が形成される領域を覆う構成となっている。このために、液晶表示パネルの表示面側にタッチパネルを取り付けた後には、配線領域は遮光膜と液晶表示パネルとの間に位置することとなり、基板欠けやクラック等による信号配線の断線を目視等で検査する目視外観検査等が非常に困難であった。このために、液晶表示パネルとタッチパネルとを貼り合わせた後の信号配線の

断線は、多くの検査時間を要する最終検査まで発見することが困難であり、簡易な検査方法が切望されている。

【0008】

一方、特許文献1に記載の方法では、信号配線毎の検査が必要となるので、最終検査と同様に、非常に多くの時間を要することが懸念される。また、特許文献2及び特許文献3には、信号配線の検査についての記載がない。

【0009】

本発明はこれらの問題点に鑑みてなされたものであり、本発明の目的は、製造工程を増加させることなく、簡易に基板の欠けやクラックによる信号配線の良否判定を可能とする技術を提供することにある。

【課題を解決するための手段】

【0010】

(1) 前記課題を解決すべく、接触位置の検出領域内に配置される検出電極と、前記検出領域よりも外側の領域に配置され、一端が前記検出電極に接続され、他端に第1の電極端子が形成される第1の信号配線とを有する透明基板と、前記第1の電極端子に接続され、前記第1の信号配線を介して前記検出電極へ駆動信号を供給すると共に、前記検出電極からの検出信号を取り出す柔軟性を有するフレキシブル配線基板とを備える座標入力装置と、外部システムからの映像信号に基づいた画像表示を行う表示パネルとを備え、前記表示パネルの表示面側に前記座標入力装置が配置される表示装置であって、前記座標入力装置は、前記第1の信号配線よりも前記透明基板の辺縁部側に配置され、前記検出領域を含む前記第1の信号配線の形成領域を取り囲むと共にその両端が開放され、前記開放端にそれぞれ検査用の電極端子が形成される第2の信号配線を備え、前記第2の信号配線は、前記透明基板の辺縁部に沿って配置される導電性薄膜で形成される表示装置である。

【0011】

(2) 前記課題を解決すべく、複数の映像信号線と、前記映像信号線に交差する複数の走査信号線と、前記映像信号線と前記走査信号線と外部システムから駆動信号及び制御信号を入力する電極端子と、前記映像信号線及び前記走査信号線と前記電極端子とを接続する第3の信号配線とが形成される第1基板と、前記第1基板に接続され前記電極端子及び第3の信号配線を介して前記映像信号線及び前記走査信号線へ駆動信号を供給する柔軟性を有するフレキシブル配線基板とを有し、前記映像信号線と前記走査信号線とに囲まれた領域を画素の領域とし、前記画素がマトリクス状に形成される領域を表示領域とし、前記第3の信号配線が前記表示領域よりも外側の領域に形成される表示装置であって、前記第3の信号配線よりも前記第1基板の辺縁部側に配置され、前記表示領域を含む前記第3の信号配線の形成領域を取り囲むと共にその両端が開放され、前記開放端にそれぞれ検査用の電極端子が形成される第4の信号配線を備え、前記第4の信号配線は、前記透明基板の辺縁部に沿って配置される導電性薄膜で形成される表示装置である。

【発明の効果】

【0012】

本発明によれば、製造工程を増加させることなく、簡易に基板の欠けやクラックによる信号配線の良否判定ができる。

【0013】

本発明のその他の効果については、明細書全体の記載から明らかにされる。

【図面の簡単な説明】

【0014】

【図1】 本発明の実施形態1の表示装置である液晶表示装置の全体構成を説明するための断面図である。

【図2】 実施形態1の液晶表示パネルの概略構成を説明するための図である。

【図3】 実施形態1のタッチパネルの概略構成を説明するための図である。

【図4】 図3に示す実施形態1の液晶表示装置におけるタッチパネルの第3基板に欠けが生じた場合の図である。

【図5】本発明の実施形態2の表示装置におけるタッチパネルの概略構成を説明するための図である。

【図6】本発明の実施形態3の表示装置におけるタッチパネルの概略構成を説明するための図である。

【図7】本発明の実施形態4の表示装置におけるタッチパネルの概略構成を説明するための図である。

【図8】実施形態1のタッチパネルにおけるフレキシブルプリント基板の概略構成を説明するための図である。

【図9】本発明の実施形態5の表示装置である液晶表示パネルの概略構成を説明するための図である。

【発明を実施するための形態】

【0015】

以下、本発明が適用された実施形態について、図面を用いて説明する。ただし、以下の説明において、同一構成要素には同一符号を付し繰り返しの説明は省略する。

【0016】

〈実施形態1〉

〈全体構成〉

図1は本発明の実施形態1の表示装置である液晶表示装置の全体構成を説明するための断面図であり、以下、図1に基づいて、実施形態1の表示装置について説明する。ただし、実施形態1の液晶表示装置は検出配線を除く他の構成は、周知の液晶表示装置と同様の構成となる。従って、以下の説明では、検出配線について詳細に説明する。また、図中に示すX、Y、ZはそれぞれX軸、Y軸、Z軸を示す。さらには、実施形態1では表示パネルに液晶表示パネルを用いた場合について説明するが、これに限定されることはなく、例えば有機EL表示パネル等を用いた構成であってもよい。

【0017】

図1に示すように、実施形態1の表示装置は、液晶表示パネルPNLと液晶表示パネルPNLの表示面側（前面側）に配置される静電容量式のタッチパネル（座標入力装置）TPとを備える構成となっており、液晶表示パネルPNL上のXY方向の座標位置を検出可能な構成となっている。液晶表示パネルPNLとタッチパネルTPとは透明すなわち透光性の接着剤ADLにより、接着されている。一方、液晶表示パネルPNLの表示面側と対向する側である裏面側にバックライト装置BLが配置される構成となっている。ただし、タッチパネルTPは静電容量式に限定されることはなく、抵抗式等の他の方式のタッチパネルであってもよい。また、液晶表示パネルPNLとタッチパネルTPとの固定は、接着剤ADLに限定されることなく、シリコンゲル等の剥離及び再接着が可能な粘着剤等であってもよい。

【0018】

液晶表示パネルPNLを構成する第1基板SUB1と第2基板SUB2とは、図示しない液晶層を介して対向配置される構成となっており、第2基板SUB2よりも第1基板SUB1がY軸方向に大きい構成となっている。この第2基板SUB2よりも大きい領域すなわち第2基板SUB2から露出した第1基板SUB1の主面側（液晶面側）には、図示しない画素に駆動信号を供給する駆動回路DR1及び外部信号等を駆動回路DR1に供給するためのフレキシブルプリント基板FPC1が配置される構成となっている。また、第1基板SUB1の裏面側すなわちバックライト装置BL側、及び第2基板SUB2の表示面側にはそれぞれ周知の偏光板POLが配置される構成となっている。

【0019】

一方、タッチパネルTPを構成する第3基板SUB3の主面側すなわち観察者側には接触位置を検出するための図示しない検出用電極が形成され、端部にフレキシブルプリント基板FPCが接続される構成となっている。該フレキシブルプリント基板FPCの端子面側には検出用電極に駆動信号を供給すると共に、検出電極に供給する駆動信号の容量変化から指等の接触位置を検出するタッチパネルTPの駆動回路DR2が搭載される構成とな

っている。また、第3基板SUB3の主面側には接着剤ADLにより、遮光板LSP及び保護板（前面保護板）PPが配置される構成となっている。

【0020】

〈液晶表示パネル及びタッチパネルの構成〉

次に、図2に実施形態1の液晶表示パネルの概略構成を説明するための図、図3に実施形態1のタッチパネルの概略構成を説明するための図を示し、以下、図2及び図3に基づいて、実施形態1の液晶表示装置について詳細に説明する。ただし、図3は実施形態1のタッチパネルの液晶表示パネル側からの平面図である。また、図2及び図3中に示すX、YはそれぞれX軸、Y軸を示し、図1に示すX軸、Y軸に対応する。

【0021】

図2に示すように、実施形態1の液晶表示パネルPNLは画素電極PXや薄膜トランジスタTFT等が形成される第1基板SUB1と、図示しないカラーフィルタやブラックマトリクスが形成され、第1基板SUB1に対向して配置される第2基板SUB2と、第1基板SUB1と第2基板SUB2とで挟持される図示しない液晶層とで構成されている。また、液晶表示パネルPNLの裏面側に当該液晶表示パネルPNLの光源となる図示しないバックライトユニット（バックライト装置）とが組み合わされて、画像表示がなされる構成となっている。第1基板SUB1と第2基板SUB2との固定及び液晶の封止は、第2基板の周辺部に環状に塗布されたシール材SLで固定され、液晶も封止される構成となっている。なお、以下の説明では、液晶表示パネルPNLの説明においても、液晶表示装置と記す。

【0022】

また、第1基板SUB1及び第2基板SUB2は、例えば周知のガラス基板が基材として用いられるのが一般的であるが、ガラス基板に限定されることはなく、石英ガラスやプラスチック（樹脂）のような他の絶縁性基板であってもよい。例えば、石英ガラスを用いれば、プロセス温度を高くできるため、薄膜トランジスタTFTのゲート絶縁膜を緻密化できるので、信頼性を向上することができる。一方、プラスチック（樹脂）基板を用いる場合には、軽量で、耐衝撃性に優れた液晶表示装置を提供できる。

【0023】

また、実施形態1の液晶表示パネルPNLでは、液晶が封入された領域の内に表示画素（以下、画素と略記する）の形成される領域が表示領域ARとなる。従って、液晶が封入されている領域内であっても、画素が形成されておらず表示に係わらない領域は表示領域ARとはならない。

【0024】

実施形態1の液晶表示装置では第1基板SUB1の液晶側の面であって表示領域AR内には、X方向に延在しY方向に並設される走査信号線（ゲート線）GLが形成されている。また、Y方向に延在しX方向に並設される映像信号線（ドレイン線）DLが形成されている。ドレイン線DLとゲート線GLとで囲まれる矩形状の領域は画素が形成される領域を構成し、これにより、各画素は表示領域AR内においてマトリクス状に配置されている。各画素は、例えば図2中丸印Aの拡大図A'に示すように、ゲート線GLからの走査信号によってオン／オフ駆動される薄膜トランジスタTFTと、このオンされた薄膜トランジスタTFTを介してドレイン線DLからの映像信号が供給される画素電極PXと、コモン線CLに接続され映像信号の電位に対して基準となる電位を有する共通電極CTとを備えている。

【0025】

画素電極PXと共通電極CTとの間には、第1基板SUB1の主面に平行な成分を有する電界が生じ、この電界によって液晶の分子を駆動させるようになっている。このような液晶表示装置は、いわゆる広視野角表示ができるものとして知られ、液晶への電界の印加の特異性から、IPS方式（IPS-Pro方式を含む）あるいは横電界方式と称される。また、このような構成の液晶表示装置において、液晶に電界が印加されていない場合に光透過率を最小（黒表示）とし、電界を印加することにより光透過率を向上させていくノ

ーマリブラック表示形態で表示を行うようになっている。なお、第2基板SUB 2の主面側（液晶面側）に共通電極CTを形成し、第1基板SUB 1に形成される画素電極PXと第2基板SUB 2に形成される共通電極CTとの間に生じる電界で液晶分子を駆動するTN方式やVA方式等の縦電界方式の液晶表示パネルであってもよい。

【0026】

各ドレイン線DL及び各ゲート線GLはその端部においてシール材SLを越えてそれぞれ延在され、駆動回路DRに接続される。ただし、実施形態1の液晶表示装置では、駆動回路DRを半導体チップで形成し第1基板SUB 1に搭載する構成としているが、映像信号を出力する映像信号駆動回路と走査信号を出力する走査信号駆動回路との何れか一方又はその両方の駆動回路をフレキシブルプリント基板FPCにテープキャリア方式やCOF（Chip On Film）方式で搭載し、第1基板SUB 1に接続させる構成であってもよい。

【0027】

なお、拡大図A'に示す共通電極CTの構成では、画素毎に独立して形成される共通電極CTにコモン線CLを介して共通信号を入力する構成としたが、これに限定されることはなく、X方向に隣接配置される画素の共通電極CTが直接に接続されるように共通電極CTを形成し、X方向の左右（第1基板SUB 1の端部）の一端又は両側からコモン線CLを介して共通信号を入力する構成でもよい。

【0028】

〈タッチパネル構成〉

図3に示すように、実施形態1のタッチパネルTPも平板状の透明なガラス基板やプラスチック基板からなる第3基板SUB 3を備える構成であり、本実施形態においては第3基板SUB 3の主面側（液晶表示パネル）側に図示しない操作者の指等による接触位置を検出するための電極が配置される構成となっている。この電極としては、例えば図中に示すように、X方向に延在しY方向に並設され、Y方向の座標位置を検出するための第1検出電極YSEと、Y方向に延在しX方向に並設され、X方向の座標位置を検出するための第2検出電極XSEとが図示しない絶縁膜を介して交差するように配置されている。このとき、実施形態1においては、第1検出電極YSE及び第2検出電極XSEは、タッチパネルTPの透明領域TTA内に形成されており、当該透明領域TTA内のX方向及びY方向の座標位置が検出可能な検出領域を形成している。なお、タッチパネルTPの裏面側に液晶表示パネルPNLを設置する構成となっているので、液晶表示パネルPNLに表示される表示内容が操作者に見えるように、透明領域TTA内に形成される第1検出電極YSE及び第2検出電極XSE並びに図示しない絶縁膜は透明材料で形成されることが望ましい。

【0029】

また、実施形態1のタッチパネルTPでは、第1検出電極YSE及び第2検出電極XSEと電極端子（第1電極端子）TRM1とを接続する信号配線（第1の信号配線）SIG1が透明領域TTAの外側領域に配置される構成となっている。このとき、第1検出電極YSEはY方向に並設される構成となっている。従って、第1検出電極YSEの端部に接続される信号配線SIG1は透明領域TTAの図中左右と第3基板SUB 3の辺縁部との間に形成され、電極端子TRM1に接続される構成となっている。また、第2検出電極XSEはX方向に並設される構成となっている。従って、透明領域TTAの図中下部と電極端子TRM1との間の領域に形成される信号配線SIG1により、第2検出電極XSEは電極端子TRM1に接続されている。

【0030】

また、実施形態1のタッチパネルTPでは、遮光板LSPの開口部PPOは透明領域TTAよりも小さく、かつ液晶表示パネルの表示領域ARよりも大きく形成されている。このような構成とすることによって、表示領域ARの端部に表示される画像に対応した接触位置の検出を確実なものとしている。また、第1検出電極YSE及び第2検出電極XSEが形成される透明領域TTAよりも開口部PPOを小さく形成することにより、透明領域TTAの端部における接触位置の検出を確実なものとしている。

【0031】

また、実施形態1のタッチパネルTPでは、信号配線SIG1よりも外側に検出配線（第2の信号配線）SIG2が形成される構成となっている。特に、実施形態1の検出配線SIG2は、第3基板SUB3の電極端子が形成される1辺を除く他の辺（図3中の上辺及び左右辺）の辺縁部に沿って形成されている。また、実施形態1では、配線幅及び配線の形成位置は、第3基板SUB3に検出配線SIG2を形成するための露光装置やエッチング装置等の精度、及び基板欠けNPが発生した場合の大きさ等の許容量に応じて適宜設定される。さらには、検出配線SIG2の配線幅は均一な配線幅となるように形成されている。ただし、検出配線SIG2の配線幅は均一な配線幅に限定されるものではない。また、実施形態1の検出配線SIG2では、第3基板SUB3の一辺に沿って配列される複数の電極端子TRM1の中で、最も外側に配置される一対の電極端子TRM1の内の一方の電極端子TRM1に検出配線SIG2の一端が接続され、最も外側に配置される一対の電極端子TRM1の内の他方の電極端子TRM1に検出配線SIG2の他端が接続される構成となっている。さらには、実施形態1の検出配線SIG2はアルミ等の光（特に可視光領域の光）に対する透過率が小さい金属薄膜で形成されている。このように、信号配線SIG1を形成するアルミ等の金属薄膜を用いて検出配線SIG2を形成することにより、信号配線SIG1と検出配線SIG2とは同層に形成されると共に、同一の工程で形成することが可能となるので、工程を増やすことなく検出配線SIG2を形成することができるといふ格別の効果を得ることができる。また、透過率の小さい金属薄膜で検出配線SIG2を形成することにより、第3基板SUB3の欠けやクラック等の発生に伴う検査者の目視による検出配線SIG2の断線検査を容易に行うことが可能となる。

【0032】

なお、検出配線SIG2を2層以上の積層薄膜で形成し、その積層膜の内の少なくとも単層を隣接領域よりも透過率が小さい材料で形成する構成であってもよい。さらには、検出配線SIG2を構成する積層膜の内の少なくとも1つの層に着色材料を混入させた薄膜層（着色層）で形成する構成であってもよい。このような構成とすることにより、検出配線SIG2を透過率の小さい単層の金属薄膜で形成した場合と同様の効果を得ることが可能となる。

【0033】

また、実施形態1のタッチパネルTPでは、タッチパネルTPの電極端子TRM1にフレキシブルプリント基板FPC2の図示しない電極端子が電氣的に接続される構成となっており、電極端子TRM1を介して駆動回路DR2からの駆動信号を供給すると共に、駆動回路DR2に検出信号を出力する構成となっている。このとき、図8に示すように、実施形態1のタッチパネルTPのフレキシブルプリント基板FPC2では、フレキシブルプリント基板FPC2の図中下部に形成される電極端子（第2電極端子）TRM2は、検出配線SIG2に電氣的に接続される電極端子有する構成となっている。すなわち、図示しない外部システムに接続される側の電極端子TRM2の内、最も外側に配置される一対の電極端子TRM2が、フレキシブルプリント基板FPC上の信号配線FSGを介して検出配線SIG2に電氣的に接続される構成となっている。

【0034】

〈基板欠けの検出〉

図4は図3に示す実施形態1の液晶表示装置におけるタッチパネルの第3基板に欠けが生じた場合の図であり、以下、図4に基づいてタッチパネルの第3基板SUB3に欠け（基板欠け）NPが生じた場合の検出動作について説明する。

【0035】

実施形態1のタッチパネルTPでは、検出配線SIG2は第3基板SUB3の辺縁部に沿って形成される構成となっている。その結果、検出配線SIG2の形成後のタッチパネルの取り扱い等により第3基板SUB3に欠けNPが発生した場合、図4に示すように、検出配線SIG2の一部が基板欠けNPと共に欠落し断線することとなる。このとき、基板欠けNPの領域が所定以上の大きさを有する場合には、実施形態1の検出配線SIG2

は透過率が小さい又は不透過の材料で形成されているので、検査者が目視により容易に欠けNPを発見（検出）することができる。

【0036】

また、液晶表示パネルPNLにタッチパネルTPを接着する際の取り扱い等により第3基板SUB3に欠けNPが発生した場合であっても、図4に示すように、検出配線SIG2の一部が基板欠けNPと共に断線することとなる。このとき、図1に示すように、第3基板SUB3に欠けNPが発生した個所は遮光板LSPと液晶表示パネルPNLとに挟まれた領域となるので、従来の構成では欠けNPを発見することは不可能であった。これに対して、実施形態1のタッチパネルTPでは、検出配線SIG2はその両端が電極端子TRM1に接続される1本の導電性薄膜で形成されているので、フレキシブルプリント基板FPCに引き出した電極端子TRM2間を測定することにより、検出配線SIG2の断線有無を検査できる。このときの断線検査は、例えば、検出配線SIG2の接続される電極端子TRM2間の抵抗値を電気抵抗の測定装置で測定する、又は一方の電極端子TRM2にパルス信号を入力し、他方の電極端子TRM2で信号検出する等の簡易な計測により、容易に検出配線SIG2の断線すなわち第3基板SUB3の欠けNPを検出することが可能となる。また、断線検査での計測結果に応じて、検出配線SIG2の断線が検出されない場合には、第3基板SUB3に欠けNPが発生していない、又は欠けNPが発生している場合であっても予め想定される許容量内の欠けNPであると判断できる。一方、検出配線SIG2の断線が検出された場合には、信号配線SIG1にも影響を与える等の許容量以上の欠けNPが発生していると判断できる。なお、検出配線SIG2の接続される電極端子TRM2の間の測定による断線測定は、液晶表示パネルPNLとの貼り合わせ前に行うことも可能である。

【0037】

一方、図4のY方向の基板欠けNPが小さい場合やクラックが発生した場合には、検出配線SIG2が欠落する領域も非常に小さいものとなり、検査者の目視による検査での発見は非常に困難なものとなる。しかしながら、実施形態1のタッチパネルTPでは、前述する検出配線SIG2の導通検査という非常に簡便な検査で第3基板SUB3の欠けNP及びクラックの発生の有無を検査することができる。

【0038】

以上説明したように、実施形態1の表示装置では、外部システムからの映像信号に基づいた画像表示を行う液晶表示パネルの表示面側に、静電容量式のタッチパネルが配置される構成となっている。このとき、実施形態1のタッチパネルでは、第1検出電極及び第2検出電極と電極端子とを接続する信号配線が形成される領域と共に、接触位置の検出が可能となる透明領域を取り囲むようにして、第3基板の辺縁部に沿った導電性を有する透過率の小さい金属薄膜からなる検出配線を備え、該検出配線の一端が電極端子に接続され、他端が別の電極端子に接続される構成となっているので、液晶表示パネルとタッチパネルとを接着する前には検査者が目視により第3基板の基板欠けを容易に検査することが可能であると共に、液晶表示パネルとタッチパネルとを固定した後であっても、検出配線が接続される電極間の抵抗測定やパルス測定等の簡易な計測で基板かけを検出することができる。

【0039】

＜実施形態2＞

図5は本発明の実施形態2の表示装置におけるタッチパネルの概略構成を説明するための図であり、特に、実施形態1の図4に対応する正面図すなわちタッチパネルの第3基板に1個所の基板欠けが生じた場合のタッチパネルを示す正面図である。ただし、実施形態2の表示装置は、タッチパネルTPの検出配線SIG2、SIG3及び電極端子TRM1、TRM2の構成が異なるのみで、液晶表示パネルの構成及びタッチパネルの他の構成は実施形態1の表示装置と同様の構成である。従って、以下の説明では、タッチパネルの備える検出配線SIG2、SIG3及び電極端子TRMの構成について詳細に説明する。また、以下の説明においては、必要に応じて、第3基板SUB3の辺縁部に近い側の検出配

線を第1検出配線SIG2、第3基板SUB3の辺縁部から遠い側の検出配線を第2検出配線SIG3と記す。また、実施形態2では独立する検出配線SIG2、SIG3が2本の場合について説明するが、3本以上の独立する検出配線を形成する構成であってもよい。

【0040】

図5に示すように、実施形態2のタッチパネルTPにおいても透明な平板状のガラス基板からなる第3基板を備える構成となっており、異なる2本の検出配線SIG2、SIG3を有する構成となっている。また、各検出配線SIG2、SIG3は、実施形態1と同様に、信号配線SIG1の配線が形成される配線領域の外側領域、すなわち信号配線SIG1と第3基板SUB3の辺縁部との間の領域に形成されている。さらには、実施形態2の検出配線SIG2、SIG3も、実施形態1と同様に、第3基板SUB3の電極端子TRM1が形成される1辺を除く他の辺（図3中の上辺及び左右辺）の辺縁部に沿って形成されている。このとき、実施形態2のタッチパネルTPでは、第3基板SUB3の辺縁部に近い側に第1検出配線SIG2が配置され、第3基板SUB3の辺縁部から遠い側すなわち信号配線SIG1に近い側に第2検出配線SIG3が配置される構成となっている。

【0041】

第1検出配線SIG2は、第3基板SUB3の一辺（図5中下部）に沿って配列される複数の電極端子TRM1の中で、最も外側に配置される一対の電極端子TRM1の内の一方の電極端子TRM1に第1検出配線SIG2の一端が接続され、最も外側に配置される一対の電極端子TRM1の内の他方の電極端子TRM1に第2検出配線SIG3の他端が接続される構成となっている。また、第2検出配線SIG3は、第1電極配線SIG2が接続される一対の電極端子TRM1の内側に隣接する電極端子TRM1に、第2検出配線SIG3の端部がそれぞれ接続される構成となっている。このような構成とすることにより、第1検出配線SIG2と第2検出配線SIG3とを信号配線SIG1と同層に形成する、すなわち信号配線SIG1と同一の工程及び配線材料で形成することを可能としている。

【0042】

このとき、第1検出配線SIG2及び第2検出配線SIG3も、信号配線SIG1と同じ工程で形成することにより、前述する実施形態1と同様の格別の効果を得ることができる。さらには、第1検出電極YSEや第2検出電極XSEと同じ工程で透明薄膜の導電層を形成した後に、導電性又は非導電性の着色層等を積層した第1検出配線SIG2及び第2検出配線SIG3を形成する等の構成であってもよい。このとき、第1検出配線SIG2を信号配線SIG1と同じ工程で形成し、第2検出配線SIG3を第1検出電極YSE又は第2検出電極XSEと同じ工程で形成する等の異なる薄膜材料からなる信号配線としてもよい。ただし、第1検出配線SIG2及び第2検出配線SIG3の薄膜材料は、可視光領域の光に対する透過率が小さい導電性薄膜であれば、他の薄膜材料であってもよく、このような透過率の小さい金属薄膜で検出配線SIG2を形成することにより、第3基板SUB3の欠けやクラック等の発生に伴う検査者の目視による第1検出配線SIG2及び第2検出配線SIG3の断線検査を容易に行うことができる。

【0043】

また、実施形態2のタッチパネルTPにおいても、フレキシブルプリント基板FPC2の図中下部に形成される電極端子TRM2には、第1検出配線SIG2及び第2検出配線SIG3にそれぞれ電氣的に接続される電極端子TRM2が形成されている。

【0044】

次に、図5に基づいて、実施形態2のタッチパネルTPにおける基板欠けNPの検査方法について説明する。ただし、以下の説明では、図5に示すように第1検出配線SIG2と第2検出配線SIG3との間に基板欠けNPの端部が止まる場合について説明する。

【0045】

検出配線SIG2の形成後であり、液晶表示パネルとの固定前にタッチパネルの取り扱い等により第3基板SUB3に欠けNPが発生した場合、図5に示すように、第1検出配

線SIG2の一部が基板欠けNPと共に欠落し断線することとなる。このとき、液晶表示パネルとの接着前である場合、第1検出配線SIG2は透過率が小さい又は不透過の材料で形成されているので、検査者が目視により容易に欠けNPを発見（検出）することができる。一方、液晶表示パネルとの接着工程やその後の取り扱い等により、第3基板に欠けNPが発生した場合には、第1検出配線SIG2及び第2検出配線SIG3はその両端が電極端子TRM1を介して電極端子TRM2に接続されているので、フレキシブルプリント基板FPCに引き出した電極端子TRM2間を測定することにより、検出配線SIG2の断線有無を検査できる。

【0046】

このとき、実施形態2のタッチパネルTPでは、第1検出配線SIG2と第2検出配線SIG3とは、第3基板SUB3の辺縁部に沿ってそれぞれ独立した検出配線となっている。従って、非常に簡便な検査である第1検出配線SIG2及び第2検出配線SIG3の断線検査での計測結果に応じて、前述する実施形態1と同様な効果である第3基板SUB3の基板欠けNPの発生の有無に加えて、発生した基板欠けNPの大きさすなわち基板欠けNPの発生程度を把握することができる。例えば、第1検出配線SIG2及び第2検出配線SIG3の2本で断線が検出されない場合には、第3基板SUB3に欠けNPが発生していない、又は欠けNPが発生している場合であっても非常に軽微な許容量内の基板欠けNPであると判断できる。また、図5に示すように、第1検出配線SIG2にのみ断線が生じていることが検出された場合には、基板欠けNPが発生しているが予め想定される許容量以内の基板欠けNPであると判断できる。一方、第1検出配線SIG2及び第2検出配線SIG3の両方の検出配線に断線が検出された場合には、信号配線SIG1にも影響を与える等の許容量以上の基板欠けNPが発生していると判断できる。

【0047】

同様にして、第3基板SUB3にクラックが発生した場合にも、第1検出配線SIG2及び第2検出配線SIG3の2本の検出配線の検出結果に基づいて、基板欠けNPと同様な判断をすることが可能となり、非常に簡便な検査で第3基板SUB3のクラックの発生の有無、及び発生したクラックの大きさすなわちクラックの発生程度を把握することができる。

【0048】

ただし、実施形態2のタッチパッドTPでは、第1検出配線SIG2と第2検出配線SIG3とがそれぞれ独立した構成となっているので、2本の検出配線の断線の有無を一緒に計測する際であっても、異なる計測方法で断線の有無を計測できる。例えば、第1検出配線SIG2の断線の有無の測定では直流電圧を対応する電極端子に印加して抵抗値を計測し、第2検出配線SIG3の断線の有無の測定ではパルス電圧を対応する電極端子に印加してその出力を計測等が可能である。

【0049】

なお、実施形態2においては、第1検出配線SIG2と第2検出配線SIG3とは同じ薄膜材料からなる同層に形成される検出配線の場合について説明したが、これに限定されることはない。例えば、第1検出配線SIG2と第2検出配線SIG3との少なくとも一方の検出配線は、一方の検出配線よりも透過率の小さい金属薄膜等で形成される層で形成してもよく、さらには、一方の検出配線のみを任意の色で着色された着色層を備える構成としてもよい。また、実施形態2では、第1検出配線及び第2検出配線は均一な配線幅であり、第1検出配線及び第2検出配線の配線幅等が同じ場合について説明したが、これに限定されることはなく、異なる配線幅や異なる色等で形成してもよい。

【0050】

〈実施形態3〉

図6は本発明の実施形態3の表示装置におけるタッチパネルの概略構成を説明するための図であり、実施形態2と同様な基板欠けNPが生じた場合のタッチパネルを示す正面図である。ただし、実施形態3の表示装置は、タッチパネルTPの第1検出配線SIG2及び第2検出配線SIG3並びに電極端子TRM1、TRM2の構成が異なるのみで、液晶

表示パネルの構成及びタッチパネルの他の構成は実施形態2の表示装置と同様の構成である。従って、以下の説明では、タッチパネルの備える第1検出配線SIG2及び第2検出配線SIG3並びに電極端子TRM1、TRM2の構成について詳細に説明する。

【0051】

図6に示すように、実施形態3のタッチパネルTPにおいても、第3基板SUB3の辺縁部に近い側に第1検出配線SIG2が配置され、第3基板SUB3の辺縁部から遠い側すなわち信号配線SIG1に近い側に第2検出配線SIG3が配置される構成となっている。このとき、第1検出配線SIG2及び第2検出配線SIG3の一端側（図6中左側）は実施形態2と同様にそれぞれ異なる電極端子TRM1に接続される構成となっている。一方、図6中丸印Bに示すように、第1検出配線SIG2及び第2検出配線SIG3の他端側（図6中右側）は同一の電極端子TRM1に接続される構成となっている。このときの第1検出配線SIG2及び第2検出配線SIG3も実施形態2と同様に、同一の薄膜材料からなる同層の検出配線、又は異なる薄膜材料からなる異なる層に形成される検出配線の何れであってもよい。

【0052】

以上説明したように、実施形態3のタッチパネルTPでは、第3基板SUB3上において、第1検出配線SIG2と第2検出配線SIG3の他端側（図6中右側）は同一の電極端子に接続される構成としている。これにより、前述する実施形態2の効果に加えて、電極端子TRM1の端子数を実施形態2よりも低減させることができるという格別の効果が得られる。

【0053】

特にフレキシブルプリント基板FPCにおいては、第3基板SUB3に形成される電極端子TRM1に対向して接触接続される電極端子の個数及び電極端子TRM2の個数並びに該電極端子間を電氣的に接続する信号配線数を低減させることができる。一方、フレキシブルプリント基板FPCのコストは形状及び面積に大きく依存しており、電極端子数及び信号配線数の低減により、フレキシブルプリント基板FPCの面積を小さくすることができるので、フレキシブルプリント基板FPCのコストを低減させると共に、当該フレキシブルプリント基板FPCを用いる実施形態3のタッチパネルTP及び表示装置のコストを低減できるという格別の効果が得られる。

【0054】

＜実施形態4＞

図7は本発明の実施形態4の表示装置におけるタッチパネルの概略構成を説明するための図であり、実施形態1の図4に対応する正面図すなわちタッチパネルの第3基板に欠けが生じた場合の正面図である。ただし、実施形態4の表示装置はタッチパネルTPのフレキシブルプリント基板FPCの電極端子の構成が異なるのみで他の構成は実施形態1と同様の構成となる。従って、以下の説明では、フレキシブルプリント基板FPCの構成について詳細に説明する。なお、実施形態4のフレキシブルプリント基板FPCの構成は、実施形態2、3のタッチパネルにも適用可能である。

【0055】

図7に示すように、実施形態4のフレキシブルプリント基板FPCでは、電極端子TRM2が形成されている位置とは異なる位置に検出配線SIG2に対応する検査専用の電極端子TRMTが配置される構成となっている。特に、実施形態4の電極端子TRMTは電極端子TRM2よりも電極端子TRM1に近い位置、すなわちタッチパネルTPの本体に近い位置に形成されている。このような構成とするために、実施形態4のタッチパネルTPのフレキシブルプリント基板FPCは、図中の上端側すなわち第3基板SUB3と接続される側に電極端子TRM1に接続される図示しない同数の電極端子を備えている。また、フレキシブルプリント基板FPCは、図中の下端側に電極端子TRM1の電極端子数から検出配線SIG2に接続される電極端子数を減算した電極端子TRM2を備えている。このとき、フレキシブルプリント基板FPCの上端部の電極端子と下端部の電極端子TRM2とは、当該フレキシブルプリント基板FPCの基材に形成される図示しない信号配線

でそれぞれ接続され、電極端子T R M 2に信号配線S I G 1が電氣的に引き出される構成となっている。また、実施形態4のフレキシブルプリント基板F P Cでは、電極端子T R M 2とは異なる領域（位置）に形成される電極端子（第3の電極端子）T R M Tは当該フレキシブルプリント基板F P C内の信号配線F S Gを介して検出配線S I G 2が接続される電極端子T R M 1に対応する当該フレキシブルプリント基板F P C上の電極端子と接続され、電極端子T R M Tに検出配線S I G 2がフレキシブルプリント基板F P Cに電氣的に引き出される構成となっている。このとき、フレキシブルプリント基板F P Cの表面側あるいは裏面側の何れか一方の面又は両面に電極端子T R M Tを形成してもよい。

【0056】

以上説明したように、実施形態4では、検出配線S I G 2に接続されるフレキシブルプリント基板F P C側の電極端子T R M Tを、信号配線S I G 1に接続される電極端子T R M 1とは異なる領域に形成する構成となっているので、実施形態1の効果に加えて容易に計測装置を電極端子T R M Tに接続でき、検査に要する時間をさらに短縮することができるという格別の効果を得られる。

【0057】

〈実施形態5〉

図9は本発明の実施形態5の表示装置である液晶表示パネルの概略構成を説明するための図であり、検出配線S I G 3及び電極端子T R M 3の構成を除く他の構成は実施形態1～4の液晶表示パネルと同様である。従って、以下の説明では、検出配線S I G 3及び電極端子T R M 3の構成について詳細に説明する。また、実施形態5の液晶表示パネルP N Lでは、実施形態1と同様に、検出配線S I G 3が1本の場合について説明するが、実施形態2、3と同様に、複数本の検出配線S I G 3を設ける構成であってもよい。さらには、実施形態4と同様に、フレキシブルプリント基板F P Cの図示しない電極端子の中で、表示データや制御信号等が入力される側の電極端子すなわち外部システムと接続される側の並設される電極端子群と異なる位置に、検出配線S I G 3に接続される電極端子を設ける構成であってもよい。なお、実施形態5では、表示装置として液晶表示パネルP N Lに検出配線S I G 3を設ける構成としたが、これに限定されることはなく、有機E L表示装置等の他の表示装置にも適用可能である。

【0058】

図9に示すように、表示領域A R内に形成されるドレイン線D L及びゲート線G Lはシール材S Lを超えて延在され、信号配線（第3の信号配線）S I G 4として駆動回路D R 1に接続されている。また、駆動回路D R 1は電極端子T R M 3とも信号配線S I G 4で接続されており、第1基板S U B 1の図中下部に接続されるフレキシブルプリント基板F P C 1を介して表示データや制御信号が駆動回路D R 1に入力される。

【0059】

このとき、実施形態5の液晶表示パネルP N Lを構成する第1基板S U B 1には、その辺縁部に沿った検出配線（第4の信号配線）S I G 2が形成されている。検出配線S I G 2の端部はそれぞれ異なる電極端子T R M 3に接続され、フレキシブルプリント基板F P Cを介して引き出される構成となっている。このとき、実施形態5の液晶表示パネルP N Lでは、図示しない共通電極に接続される図示しないコモン線、及び該コモン線と接続される図示しない信号配線も検出配線S I G 2の内側、すなわち検出配線S I G 2に囲まれる領域に形成されている。

【0060】

また、実施形態5の液晶表示パネルP N Lでは、第1基板S U B 1の図中下部に駆動回路D R 1を配置する構成としたが、駆動回路D R 1はこれに限定されることはない。例えば、表示領域A Rの図中左右に薄膜トランジスタでゲート信号を生成するゲート駆動回路を形成した場合には、該ゲート駆動回路及びゲート駆動回路に接続される信号配線を取り囲むように検出配線S I G 3を形成する。すなわち、ゲート駆動回路と信号配線との内で最も第1基板の辺縁部に近い部位と、第1基板S U B 1の辺縁部との間の領域に検出配線S I G 3を形成する。

【0061】

以上説明したように、実施形態5の表示装置においては、信号配線SIG4が形成されない図中上部の領域では当該表示領域ARと第1基板SUB1の辺縁部との間の領域に、また信号配線SIG4が形成される領域においては、当該信号配線SIG4と第1基板SUB1の辺縁部との間の領域に、第1基板SUB1の辺縁部に沿って検出配線SIG3を形成する構成となっているので、検査者が目視により第1基板SUB1の基板欠けを容易に検査することが可能であると共に、検出配線SIG3が接続される電極間の抵抗測定やパルス測定等の簡易な計測で基板欠けを検出することができる。

【0062】

なお、実施形態1～4の表示装置におけるタッチパネルでは、2点以上の接触位置の検出が可能な静電容量式のタッチパネルに本願発明を適用した場合について説明したが、これに限定されることはなく、抵抗式等の他の方式のタッチパネルにも適用可能である。

【0063】

また、実施形態1～4の表示装置におけるタッチパネルでは、第3基板に接続されるフレキシブルプリント基板にも検出配線SIG2に接続される電極端子を形成する構成としたが、これに限定されることはなく、第3基板に形成される電極端子のみであってもよい。

【0064】

以上、本発明者によってなされた発明を、前記発明の実施形態に基づき具体的に説明したが、本発明は、前記発明の実施形態に限定されるものではなく、その要旨を逸脱しない範囲において種々変更可能である。

【符号の説明】

【0065】

TP……タッチパネル、PNL……液晶表示装置、BL……バックライト装置
SUB1……第1基板、SUB2……第2基板、SUB3……第3基板
POL……偏光板、ADL……接着剤、LSP……遮光板、PP……前面保護板
PPO……開口部（前面保護板開口部）、DR1, 2……駆動回路、AR……表示領域
FPC1, 2……フレキシブルプリント基板、SL……シール材、DL……ドレイン線
GL……ゲート線、PX……画素電極、CT……共通電極、TFT……薄膜トランジスタ
TTA……透明領域、CL……コモン線、SIG1、FSG……信号配線
NP……基板欠け、SIG2……検出配線（第1検出配線）、SIG3……第2検出配線
SIG4……信号配線、YSE……第1検出電極、XSE……第2検出電極
TRM1～3……電極端子

【書類名】特許請求の範囲

【請求項 1】

接触位置の検出領域内に配置される検出電極と、前記検出領域よりも外側の領域に配置され、一端が前記検出電極に接続され、他端に第 1 の電極端子が形成される第 1 の信号配線とを有する透明基板と、前記第 1 の電極端子に接続され、前記第 1 の信号配線を介して前記検出電極へ駆動信号を供給すると共に、前記検出電極からの検出信号を取り出す柔軟性を有するフレキシブル配線基板とを備える座標入力装置と、

外部システムからの映像信号に基づいた画像表示を行う表示パネルとを備え、前記表示パネルの表示面側に前記座標入力装置が配置される表示装置であって、

前記座標入力装置は、前記第 1 の信号配線よりも前記透明基板の辺縁部側に配置され、前記検出領域を含む前記第 1 の信号配線の形成領域を取り囲むと共にその両端が開放され、前記開放端にそれぞれ検査用の電極端子が形成される第 2 の信号配線を備え、

前記第 2 の信号配線は、前記透明基板の辺縁部に沿って配置される導電性薄膜で形成されることを特徴とする表示装置。

【請求項 2】

前記第 2 の信号配線は、着色された薄膜層又は所定値以下の透過率を有する薄膜層を備えることを特徴とする請求項 1 に記載の表示装置。

【請求項 3】

前記第 2 の信号配線は、金属薄膜層を備えることを特徴とする請求項 1 に記載の表示装置。

【請求項 4】

前記第 2 の信号配線は、2 本以上の導電性薄膜で形成されることを特徴とする請求項 1 乃至 3 の内の何れかに記載の表示装置。

【請求項 5】

前記第 2 の信号配線は、一端が同一の検査用の電極端子に接続され、他端がそれぞれ異なる検査用の電極端子に接続されることを特徴とする請求項 4 に記載の表示装置。

【請求項 6】

前記フレキシブル配線基板は、外部システムと接続される第 2 の電極端子の形成領域とは異なる位置に、前記第 2 の信号配線に接続される第 3 の電極端子を備えることを特徴とする請求項 1 乃至 5 の内の何れかに記載の表示装置。

【請求項 7】

複数の映像信号線と、前記映像信号線に交差する複数の走査信号線と、前記映像信号線と前記走査信号線と外部システムから駆動信号及び制御信号を入力する電極端子と、前記映像信号線及び前記走査信号線と前記電極端子とを接続する第 3 の信号配線とが形成される第 1 基板と、前記第 1 基板に接続され前記電極端子及び第 3 信号配線を介して前記映像信号線及び前記走査信号線へ駆動信号を供給する柔軟性を有するフレキシブル配線基板とを有し、前記映像信号線と前記走査信号線とに囲まれた領域を画素の領域とし、前記画素がマトリクス状に形成される領域を表示領域とし、前記第 3 の信号配線が前記表示領域よりも外側の領域に形成される表示装置であって、

前記第 3 の信号配線よりも前記第 1 基板の辺縁部側に配置され、前記表示領域を含む前記第 3 の信号配線の形成領域を取り囲むと共にその両端が開放され、前記開放端にそれぞれ検査用の電極端子が形成される第 4 の信号配線を備え、

前記第 4 の信号配線は、前記透明基板の辺縁部に沿って配置される導電性薄膜で形成されることを特徴とする表示装置。

【請求項 8】

前記第 4 の信号配線は、着色された薄膜層又は所定値以下の透過率を有する薄膜層を備えることを特徴とする請求項 7 に記載の表示装置。

【請求項 9】

前記第 4 の信号配線は、金属薄膜層を備えることを特徴とする請求項 7 に記載の表示装置。

【請求項 1 0】

前記第 4 の信号配線は、2 本以上の導電性薄膜で形成されることを特徴とする請求項 7 乃至 9 の内の何れかに記載の表示装置。

【請求項 1 1】

前記第 4 の信号配線は、一端が同一の検査用の電極端子に接続され、他端がそれぞれ異なる検査用の電極端子に接続されることを特徴とする請求項 1 0 に記載の表示装置。

【請求項 1 2】

前記フレキシブル配線基板は、外部システムと接続される電極端子の形成領域とは異なる位置に、前記第 4 の信号配線に接続される電極端子を備えることを特徴とする請求項 7 乃至 1 2 の内の何れかに記載の表示装置。

【書類名】 要約書

【要約】

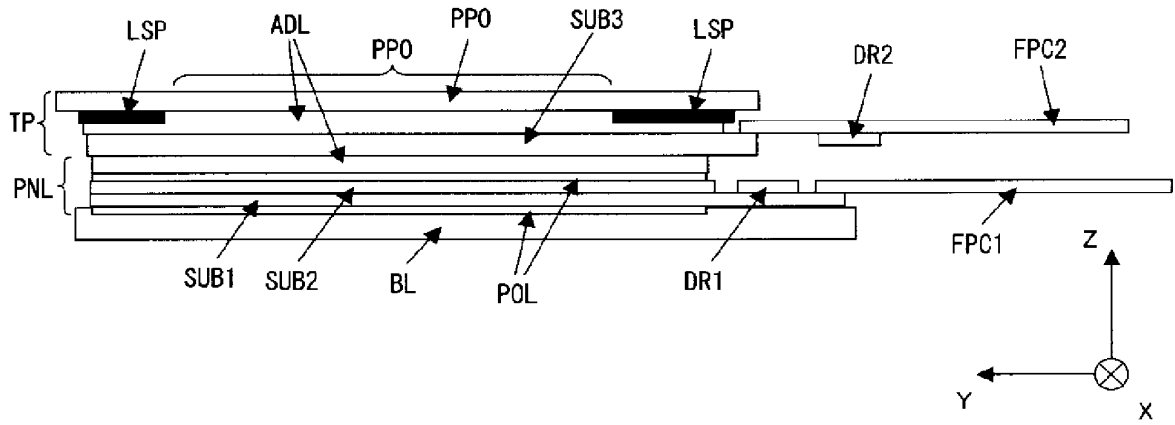
【課題】 製造工程を増加させることなく、簡易に基板の欠けやクラックによる信号配線の良否判定を可能とする技術を提供することである。

【解決手段】

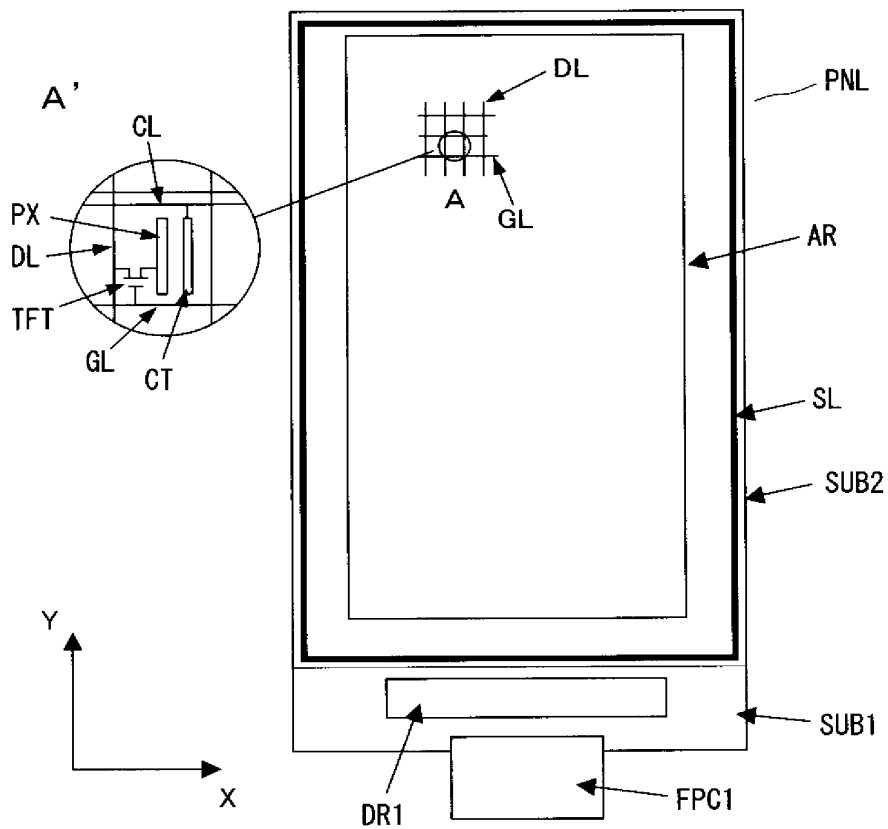
接触位置の検出領域よりも外側の領域に配置され、一端が検出電極に接続され、他端に第 1 の電極端子が形成される第 1 の信号配線を有する透明基板と、前記第 1 の電極端子に接続される柔軟性を有するフレキシブル配線基板とを備える座標入力装置と、外部システムからの映像信号に基づいた画像表示を行う表示パネルとを備える表示装置であって、前記座標入力装置は、前記第 1 の信号配線よりも前記透明基板の辺縁部側に配置され、前記検出領域を含む前記第 1 の信号配線の形成領域を取り囲むと共にその両端が開放され、前記開放端にそれぞれ検査用の電極端子が形成される第 2 の信号配線を備え、前記第 2 の信号配線は、前記透明基板の辺縁部に沿って配置される導電性薄膜で形成される表示装置である。

【選択図】 図 3

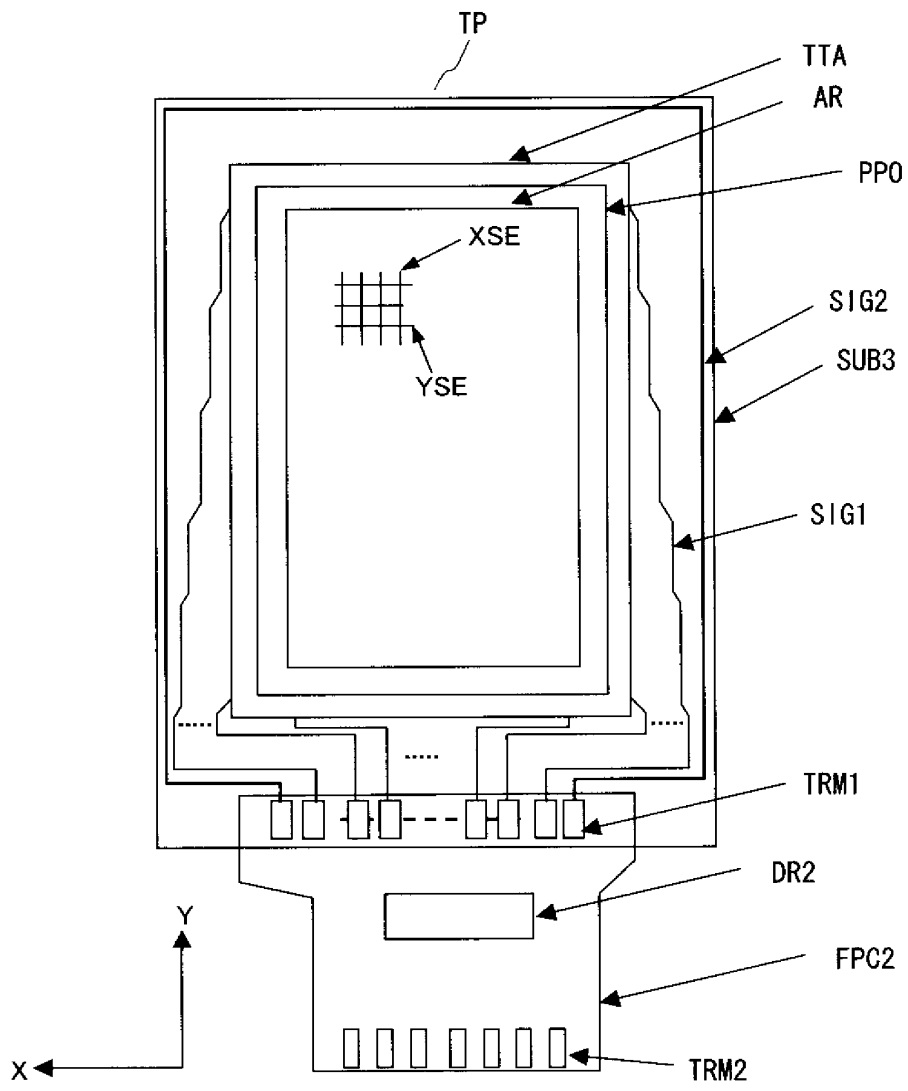
【書類名】 図面
【図 1】



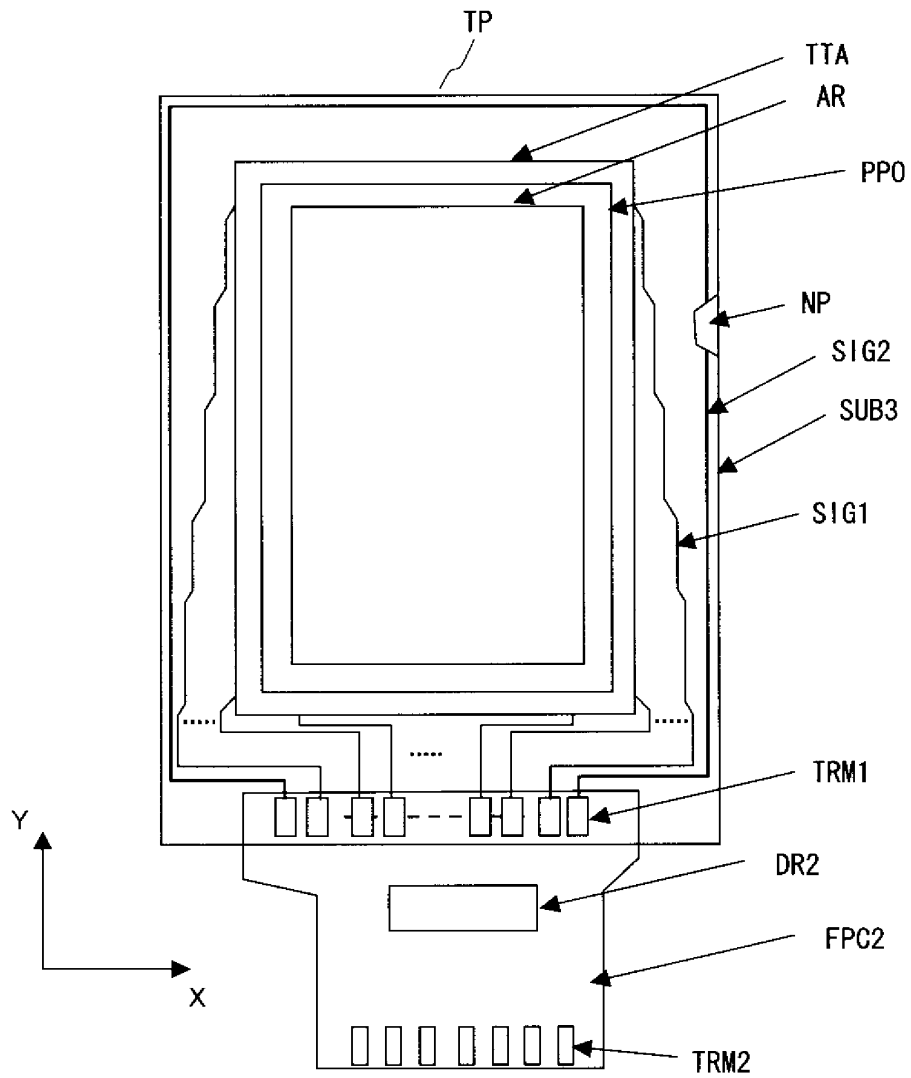
【図 2】



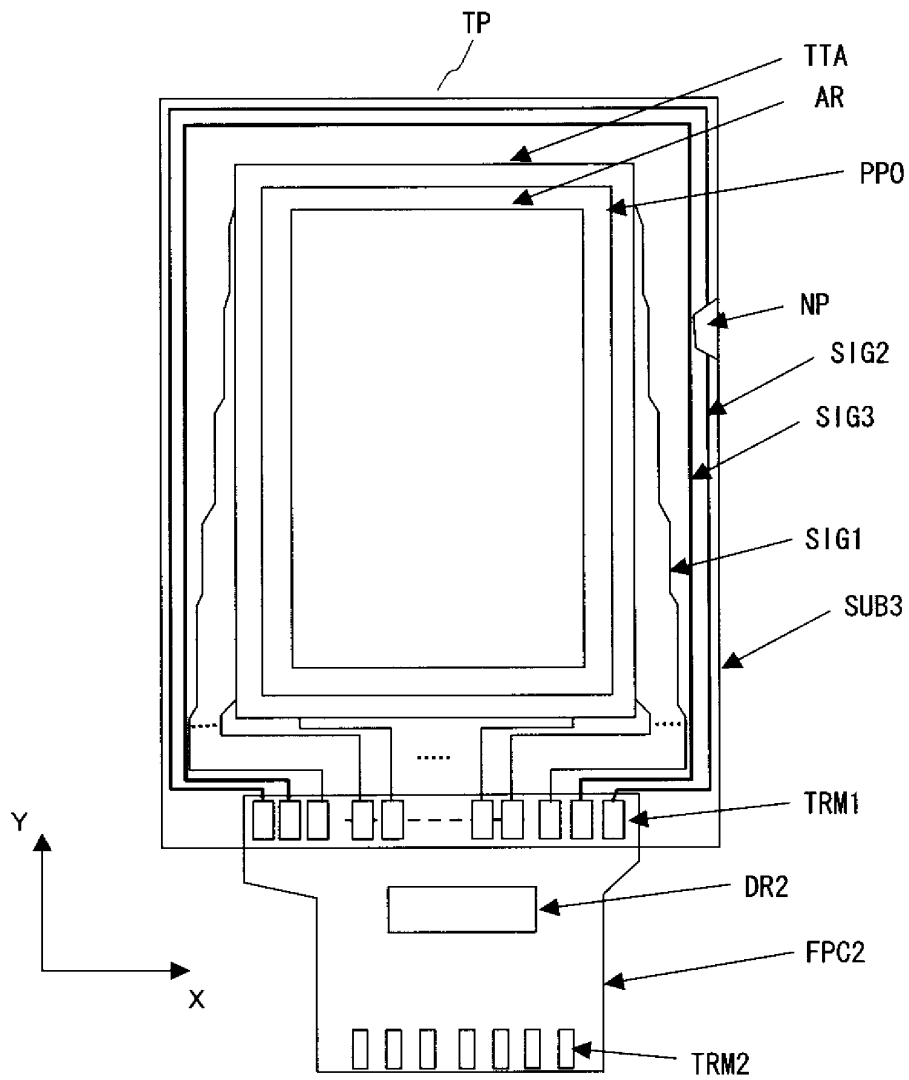
【图3】



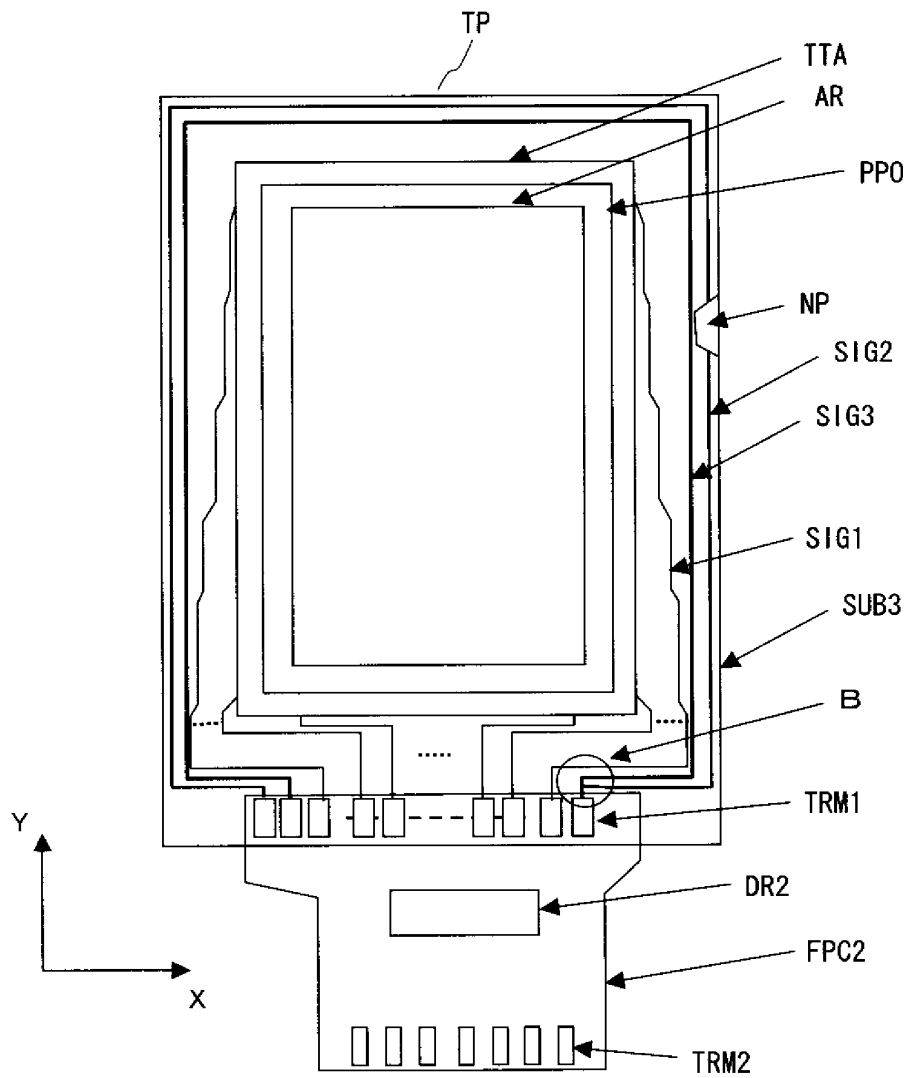
【图4】



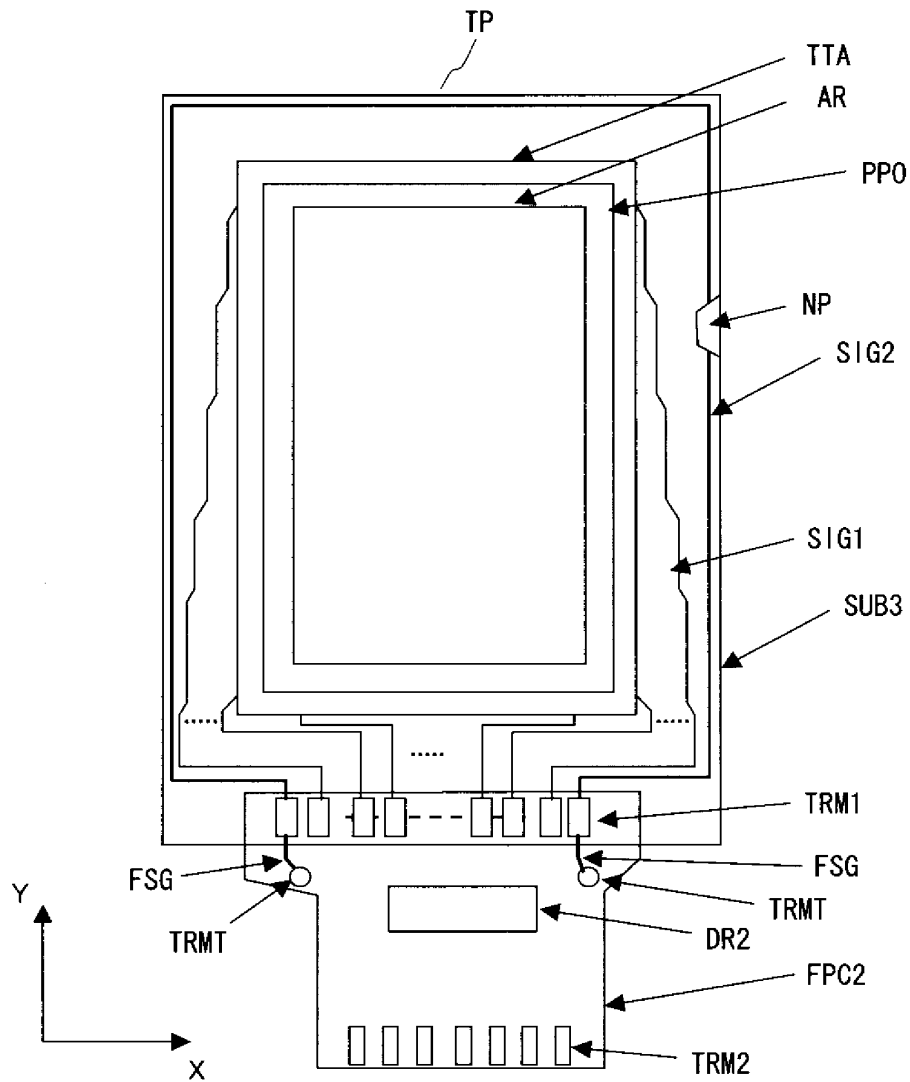
【图 5】



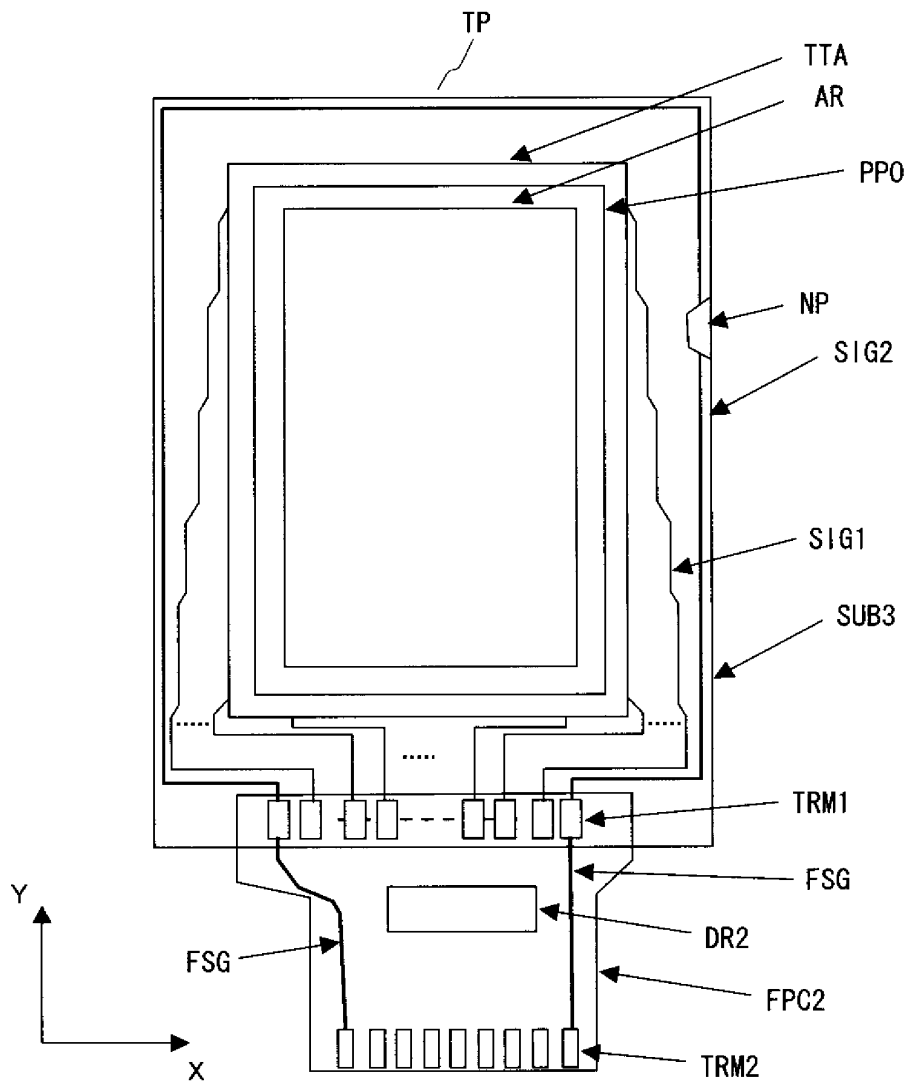
【图6】



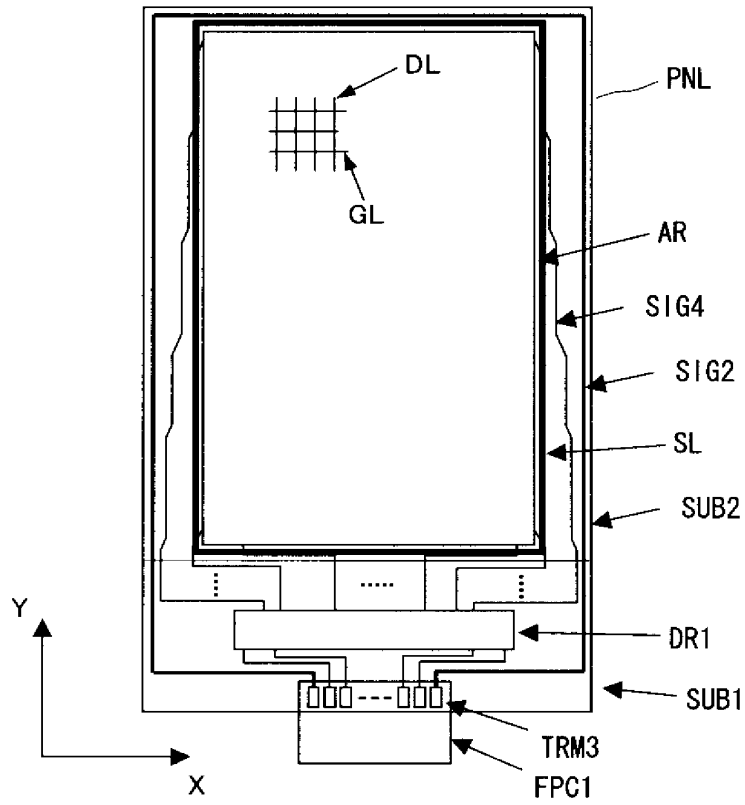
【图 7】



【图8】



【図 9】



【書類名】 出願人名義変更届（一般承継）
【整理番号】 331000022
【あて先】 特許庁長官殿
【事件の表示】
 【出願番号】 特願2010-126877
【承継人】
 【識別番号】 506087819
 【氏名又は名称】 パナソニック液晶ディスプレイ株式会社
【承継人代理人】
 【識別番号】 110000154
 【氏名又は名称】 特許業務法人はるか国際特許事務所
 【代表者】 岩本 康隆
 【電話番号】 03-5367-2790
【提出物件の目録】
 【物件名】 株式会社日立ディスプレイズの会社分割を証明する書面 1
 【援用の表示】 平成23年1月12日付提出の特願2008-133913の手続補足書（名義変更届）に添付のもの（閉鎖事項一部証明書）を援用する。

 【物件名】 パナソニック液晶ディスプレイ株式会社が承継人であることを証明する書面 1
 【援用の表示】 平成23年1月12日付提出の特願2008-133913の手続補足書（名義変更届）に添付のもの（履歴事項一部証明書）を援用する。

 【物件名】 株式会社日立ディスプレイズによる株式会社IPSアルファ支援会社への権利の承継を証明する書面 1
 【援用の表示】 平成22年11月5日付提出の特許第3090480号外98件に係る会社分割による一部移転登録申請書（1）に添付のもの（会社分割承継証明書）を援用する。

【包括委任状番号】 0807200

【書類名】 手続補正書
 【整理番号】 EJP-000460
 【提出日】 平成26年 2月 3日
 【あて先】 特許庁長官 殿
 【事件の表示】
 【出願番号】 特願2010-126877
 【補正をする者】
 【識別番号】 502356528
 【氏名又は名称】 株式会社ジャパンディスプレイ
 【補正をする者】
 【識別番号】 506087819
 【氏名又は名称】 パナソニック液晶ディスプレイ株式会社
 【代理人】
 【識別番号】 100075959
 【弁理士】
 【氏名又は名称】 小 林 保
 【電話番号】 (03)3865-9755
 【発送番号】 803418
 【手続補正1】
 【補正対象書類名】 特許請求の範囲
 【補正対象項目名】 全文
 【補正方法】 変更
 【補正の内容】
 【書類名】 特許請求の範囲
 【請求項 1】

接触位置の検出領域内に配置される検出電極と、前記検出領域よりも外側の領域に配置され、一端が前記検出電極に接続され、他端に第 1 の電極端子が形成される第 1 の信号配線とを有する透明基板と、前記第 1 の電極端子に接続され、前記第 1 の信号配線を介して前記検出電極へ駆動信号を供給すると共に、前記検出電極からの検出信号を取り出す柔軟性を有するフレキシブル配線基板とを備える座標入力装置と、

外部システムからの映像信号に基づいた画像表示を行う表示パネルとを備え、前記表示パネルの表示面側に前記座標入力装置が配置される表示装置であって、

前記座標入力装置は、前記第 1 の信号配線よりも前記透明基板の辺縁部側に配置され、前記検出領域を含む前記第 1 の信号配線の形成領域を取り囲むと共にその両端が開放され、前記開放端にそれぞれ検査用の電極端子が形成される第 2 の信号配線を備え、

前記第 2 の信号配線は、前記透明基板の辺縁部に沿って配置される導電性薄膜で形成されることを特徴とする表示装置。

【請求項 2】

前記第 2 の信号配線は、着色された薄膜層又は所定値以下の透過率を有する薄膜層を備えることを特徴とする請求項 1 に記載の表示装置。

【請求項 3】

前記第 2 の信号配線は、金属薄膜層を備えることを特徴とする請求項 1 に記載の表示装置。

【請求項 4】

前記第 2 の信号配線は、2 本以上の導電性薄膜で形成されることを特徴とする請求項 1 乃至 3 の内の何れかに記載の表示装置。

【請求項 5】

前記第 2 の信号配線は、一端が同一の検査用の電極端子に接続され、他端がそれぞれ異なる検査用の電極端子に接続されることを特徴とする請求項 4 に記載の表示装置。

【請求項 6】

前記フレキシブル配線基板は、外部システムと接続される第2の電極端子の形成領域とは異なる位置に、前記第2の信号配線に接続される第3の電極端子を備えることを特徴とする請求項1乃至5の内の何れかに記載の表示装置。

【請求項7】

前記表示パネルは、複数の映像信号線と、前記映像信号線に交差する複数の走査信号線と、前記映像信号線と前記走査信号線と外部システムから駆動信号及び制御信号を入力する電極端子と、前記映像信号線及び前記走査信号線と前記電極端子とを接続する第3の信号配線とが形成される第1基板と、前記第1基板に接続され前記電極端子及び第3の信号配線を介して前記映像信号線及び前記走査信号線へ駆動信号を供給する柔軟性を有する第2のフレキシブル配線基板とを有し、

前記映像信号線と前記走査信号線とに囲まれた領域を画素の領域とし、前記画素がマトリクス状に形成される領域を表示領域とし、前記第3の信号配線が前記表示領域よりも外側の領域に形成されてなり、

前記第3の信号配線よりも前記第1基板の辺縁部側に配置され、前記表示領域を含む前記第3の信号配線の形成領域を取り囲むと共にその両端が開放され、前記開放端にそれぞれ検査用の電極端子が形成される第4の信号配線を備え、

前記第4の信号配線は、前記透明基板の辺縁部に沿って配置される導電性薄膜で形成されることを特徴とする請求項1乃至6の内の何れかに記載の表示装置。

【請求項8】

前記第4の信号配線は、着色された薄膜層又は所定値以下の透過率を有する薄膜層を備えることを特徴とする請求項7に記載の表示装置。

【請求項9】

前記第4の信号配線は、金属薄膜層を備えることを特徴とする請求項7に記載の表示装置。

【請求項10】

前記第4の信号配線は、2本以上の導電性薄膜で形成されることを特徴とする請求項7乃至9の内の何れかに記載の表示装置。

【請求項11】

前記第4の信号配線は、一端が同一の検査用の電極端子に接続され、他端がそれぞれ異なる検査用の電極端子に接続されることを特徴とする請求項10に記載の表示装置。

【請求項12】

前記第2のフレキシブル配線基板は、外部システムと接続される電極端子の形成領域とは異なる位置に、前記第4の信号配線に接続される電極端子を備えることを特徴とする請求項7乃至11の内の何れかに記載の表示装置。

【手続補正2】

【補正対象書類名】 明細書
【補正対象項目名】 0011
【補正方法】 変更
【補正の内容】
【0011】

(2) 前記課題を解決すべく、前述する(1)に記載の前記表示パネルは、複数の映像信号線と、前記映像信号線に交差する複数の走査信号線と、前記映像信号線と前記走査信号線と外部システムから駆動信号及び制御信号を入力する電極端子と、前記映像信号線及び前記走査信号線と前記電極端子とを接続する第3の信号配線とが形成される第1基板と、前記第1基板に接続され前記電極端子及び第3の信号配線を介して前記映像信号線及び前記走査信号線へ駆動信号を供給する柔軟性を有する第2のフレキシブル配線基板とを有し、

前記映像信号線と前記走査信号線とに囲まれた領域を画素の領域とし、前記画素がマトリクス状に形成される領域を表示領域とし、前記第3の信号配線が前記表示領域よりも外

側の領域に形成されてなり、

前記第3の信号配線よりも前記第1基板の辺縁部側に配置され、前記表示領域を含む前記第3の信号配線の形成領域を取り囲むと共にその両端が開放され、前記開放端にそれぞれ検査用の電極端子が形成される第4の信号配線を備え、

前記第4の信号配線は、前記透明基板の辺縁部に沿って配置される導電性薄膜で形成される表示装置である。

【手続補正3】

【補正対象書類名】 明細書
【補正対象項目名】 0057
【補正方法】 変更
【補正の内容】
【0057】

＜実施形態5＞

図9は本発明の実施形態5の表示装置である液晶表示パネルの概略構成を説明するための図であり、検出配線SIG2及び電極端子TRM3の構成を除く他の構成は実施形態1～4の液晶表示パネルと同様である。従って、以下の説明では、検出配線SIG2及び電極端子TRM3の構成について詳細に説明する。また、実施形態5の液晶表示パネルPNLでは、実施形態1と同様に、検出配線SIG2が1本の場合について説明するが、実施形態2、3と同様に、複数本の検出配線SIG2を設ける構成であってもよい。さらには、実施形態4と同様に、フレキシブルプリント基板FPCの図示しない電極端子の中で、表示データや制御信号等が入力される側の電極端子すなわち外部システムと接続される側の並設される電極端子群と異なる位置に、検出配線SIG2に接続される電極端子を設ける構成であってもよい。なお、実施形態5では、表示装置として液晶表示パネルPNLに検出配線SIG2を設ける構成としたが、これに限定されることはなく、有機EL表示装置等の他の表示装置にも適用可能である。

【手続補正4】

【補正対象書類名】 明細書
【補正対象項目名】 0060
【補正方法】 変更
【補正の内容】
【0060】

また、実施形態5の液晶表示パネルPNLでは、第1基板SUB1の図中下部に駆動回路DR1を配置する構成としたが、駆動回路DR1はこれに限定されることはない。例えば、表示領域ARの図中左右に薄膜トランジスタでゲート信号を生成するゲート駆動回路を形成した場合には、該ゲート駆動回路及びゲート駆動回路に接続される信号配線を取り囲むように検出配線SIG2を形成する。すなわち、ゲート駆動回路と信号配線との内で最も第1基板の辺縁部に近い部位と、第1基板SUB1の辺縁部との間の領域に検出配線SIG2を形成する。

【手続補正5】

【補正対象書類名】 明細書
【補正対象項目名】 0061
【補正方法】 変更
【補正の内容】
【0061】

以上説明したように、実施形態5の表示装置においては、信号配線SIG4が形成されない図中上部の領域では当該表示領域ARと第1基板SUB1の辺縁部との間の領域に、また信号配線SIG4が形成される領域においては、当該信号配線SIG4と第1基板S

UB 1 の辺縁部との間の領域に、第 1 基板 SUB 1 の辺縁部に沿って検出配線 SIG 2 を形成する構成となっているので、検査者が目視により第 1 基板 SUB 1 の基板欠けを容易に検査することが可能であると共に、検出配線 SIG 2 が接続される電極間の抵抗測定やパルス測定等の簡易な計測で基板欠けを検出することができる。

出願人履歴

5 0 2 3 5 6 5 2 8

20021001

新規登録

千葉県茂原市早野3 3 0 0 番地

株式会社 日立ディスプレイズ

5 0 2 3 5 6 5 2 8

20120410

名称変更

千葉県茂原市早野3 3 0 0 番地

株式会社ジャパンディスプレイイースト

5 0 2 3 5 6 5 2 8

20130426

名称変更 住所変更

東京都港区西新橋三丁目7 番1 号

株式会社ジャパンディスプレイ

5 0 6 0 8 7 8 1 9

20060315

新規登録

千葉県茂原市早野3 7 3 2 番地

株式会社 I P S アルファテクノロジー

5 0 6 0 8 7 8 1 9

20101004

名称変更 住所変更

兵庫県姫路市飾磨区妻鹿日田町 1 - 6

パナソニック液晶ディスプレイ株式会社



UNITED STATES PATENT AND TRADEMARK OFFICE

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

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
15/005,737	01/25/2016	Kouichi ANNO	0520-51700CX1CON	7062
133303	7590	03/23/2016		
TYPHA IP LLC 1819 L Street NW Suite 200 Washington, DC 20036			EXAMINER LEE JR, KENNETH B	
			ART UNIT 2697	PAPER NUMBER
			NOTIFICATION DATE 03/23/2016	DELIVERY MODE 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):

arimi.yamada@typhaip.com
TYPHA_IP@typhaip.com
typha_japan@typhaip.com

Office Action Summary	Application No. 15/005,737	Applicant(s) ANNO ET AL.	
	Examiner KENNETH B. LEE JR	Art Unit 2697	AIA (First Inventor to File) Status No

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

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTHS FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1) ☒ Responsive to communication(s) filed on 1/25/2016.
☐ A declaration(s)/affidavit(s) under **37 CFR 1.130(b)** was/were filed on _____.

2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.

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

4) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims*

5) ☒ Claim(s) 1-19 is/are pending in the application.
5a) Of the above claim(s) _____ is/are withdrawn from consideration.

6) ☐ Claim(s) _____ is/are allowed.

7) ☒ Claim(s) 1-19 is/are rejected.

8) ☐ Claim(s) _____ is/are objected to.

9) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

* If any claims have been determined allowable, you may be eligible to benefit from the **Patent Prosecution Highway** program at a participating intellectual property office for the corresponding application. For more information, please see http://www.uspto.gov/patents/init_events/pph/index.jsp or send an inquiry to PPHfeedback@uspto.gov.

Application Papers

10) ☐ The specification is objected to by the Examiner.

11) ☒ The drawing(s) filed on 1/25/2016 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

Priority under 35 U.S.C. § 119

12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

Certified copies:

a) ☒ All b) ☐ Some** c) ☐ None of the:

1. ☒ Certified copies of the priority documents have been received.

2. ☐ Certified copies of the priority documents have been received in Application No. _____.

3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

** See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)

2) ☒ Information Disclosure Statement(s) (PTO/SB/08a and/or PTO/SB/08b)
Paper No(s)/Mail Date _____.

3) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____.

4) ☐ Other: _____.

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

DETAILED ACTION

Double Patenting

2. The nonstatutory double patenting rejection is based on a judicially created doctrine grounded in public policy (a policy reflected in the statute) so as to prevent the unjustified or improper timewise extension of the “right to exclude” granted by a patent and to prevent possible harassment by multiple assignees. A nonstatutory double patenting rejection is appropriate where the claims at issue are not identical, but at least one examined application claim is not patentably distinct from the reference claim(s) because the examined application claim is either anticipated by, or would have been obvious over, the reference claim(s). See, e.g., *In re Berg*, 140 F.3d 1428, 46 USPQ2d 1226 (Fed. Cir. 1998); *In re Goodman*, 11 F.3d 1046, 29 USPQ2d 2010 (Fed. Cir. 1993); *In re Longi*, 759 F.2d 887, 225 USPQ 645 (Fed. Cir. 1985); *In re Van Ornum*, 686 F.2d 937, 214 USPQ 761 (CCPA 1982); *In re Vogel*, 422 F.2d 438, 164 USPQ 619 (CCPA 1970); and *In re Thorington*, 418 F.2d 528, 163 USPQ 644 (CCPA 1969).

A timely filed terminal disclaimer in compliance with 37 CFR 1.321(c) or 1.321(d) may be used to overcome an actual or provisional rejection based on a nonstatutory double patenting ground provided the reference application or patent either is shown to be commonly owned with this application, or claims an invention made as a result of activities undertaken within the scope of a joint research agreement. See MPEP § 717.02 for applications subject to examination under the first inventor to file provisions

Art Unit: 2697

of the AIA as explained in MPEP § 2159. See MPEP §§ 706.02(l)(1) - 706.02(l)(3) for applications not subject to examination under the first inventor to file provisions of the AIA. A terminal disclaimer must be signed in compliance with 37 CFR 1.321(b).

The USPTO Internet website contains terminal disclaimer forms which may be used. Please visit www.uspto.gov/forms/. The filing date of the application in which the form is filed determines what form (e.g., PTO/SB/25, PTO/SB/26, PTO/AIA/25, or PTO/AIA/26) should be used. A web-based eTerminal Disclaimer may be filled out completely online using web-screens. An eTerminal Disclaimer that meets all requirements is auto-processed and approved immediately upon submission. For more information about eTerminal Disclaimers, refer to <http://www.uspto.gov/patents/process/file/efs/guidance/eTD-info-I.jsp>.

3. Claims 1-19 are rejected on the ground of nonstatutory double patenting as being unpatentable over claims 13-29 of U.S. Patent No. 9,274,631. Although the claims at issue are not identical, they are not patentably distinct from each other because the terms “electrode” and “terminal” are interchangeable.

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to KENNETH B. LEE JR whose telephone number is (571)270-3147. The examiner can normally be reached on Mon. - Fri. 7:30AM - 4:00 PM EST.

Art Unit: 2697

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Alexander Eisen can be reached on 571-272-7687. 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.

/KENNETH B LEE JR/
Primary Examiner
Art Unit 2697

Notice of References Cited	Application/Control No. 15/005,737		Applicant(s)/Patent Under Reexamination ANNO ET AL.	
	Examiner KENNETH B. LEE JR		Art Unit 2697	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-9,274,631 B2	03-2016	Anno; Kouichi	G06F3/041	1/1
	B	US-				
	C	US-				
	D	US-				
	E	US-				
	F	US-				
	G	US-				
	H	US-				
	I	US-				
	J	US-				
	K	US-				
	L	US-				
	M	US-				

FOREIGN PATENT DOCUMENTS

*		Document Number Country Code-Number-Kind Code	Date MM-YYYY	Country	Name	CPC Classification
	N					
	O					
	P					
	Q					
	R					
	S					
	T					

NON-PATENT DOCUMENTS

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

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



UNITED STATES PATENT AND TRADEMARK OFFICE

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

BIB DATA SHEET

CONFIRMATION NO. 7062

SERIAL NUMBER	FILING or 371(c) DATE	CLASS	GROUP ART UNIT	ATTORNEY DOCKET NO.		
15/005,737	01/25/2016	345	2697	0520-51700CX1CON		
RULE						
APPLICANTS Japan Display Inc., Tokyo, JAPAN; Panasonic Liquid Crystal Display Co. Ltd., Hyogo-ken, JAPAN; INVENTORS Kouichi ANNO, Mobara, JAPAN; Takumi SATO, Mobara, JAPAN; Masahiro TERAMOTO, Mobara, JAPAN; ** CONTINUING DATA ***** This application is a CON of 14/254,926 04/17/2014 PAT 9274631 which is a CON of 13/151,362 06/02/2011 PAT 8704762 ** FOREIGN APPLICATIONS ***** JAPAN 2010-126877 06/02/2010 ** IF REQUIRED, FOREIGN FILING LICENSE GRANTED ** 02/09/2016						
Foreign Priority claimed ☒ Yes ☐ No 35 USC 119(a-d) conditions met ☒ Yes ☐ No Verified and /KENNETH B LEE JR/ Acknowledged Examiner's Signature		☐ Met after Allowance KBL Initials	STATE OR COUNTRY JAPAN	SHEETS DRAWINGS 8	TOTAL CLAIMS 19	INDEPENDENT CLAIMS 2
ADDRESS TYPHA IP LLC 1819 L Street NW Suite 200 Washington, DC 20036 UNITED STATES						
TITLE DISPLAY DEVICE						
FILING FEE RECEIVED 1600	FEES: Authority has been given in Paper No. _____ to charge/credit DEPOSIT ACCOUNT No. _____ for following:			☐ All Fees ☐ 1.16 Fees (Filing) ☐ 1.17 Fees (Processing Ext. of time) ☐ 1.18 Fees (Issue) ☐ Other _____ ☐ Credit		

<i>Index of Claims</i> 	Application/Control No. 15005737	Applicant(s)/Patent Under Reexamination ANNO ET AL.
	Examiner KENNETH B LEE JR	Art Unit 2697

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

☐ Claims renumbered in the same order as presented by applicant ☐ CPA ☐ T.D. ☐ R.1.47										
CLAIM		DATE								
Final	Original	03/19/2016								
	1	✓								
	2	✓								
	3	✓								
	4	✓								
	5	✓								
	6	✓								
	7	✓								
	8	✓								
	9	✓								
	10	✓								
	11	✓								
	12	✓								
	13	✓								
	14	✓								
	15	✓								
	16	✓								
	17	✓								
	18	✓								
	19	✓								

INFORMATION DISCLOSURE STATEMENT BY APPLICANT (Not for submission under 37 CFR 1.99)	Application Number	15/005,737
	Filing Date	1-25-2016
	First Named Inventor	Kouichi ANNO et al.
	Art Unit	2697
	Examiner Name	/KENNETH B LEE JR/
	Attorney Docket Number	0520-51700CX1CON

U.S.PATENTS						
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	8482301	B2	2013-07-09	Takashi KURASHIMA	
	2	7034442	B2	2006-04-25	Hiroshi HIRAYAMA et al.	
	3	6262579	B1	2001-07-17	DAVID J CHAZAN et al.	
	4	7167154	B2	2007-01-23	Tomohiko SATO et al.	
If you wish to add additional U.S. Patent citation information please click the Add button.						
U.S.PATENT APPLICATION PUBLICATIONS						
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	20080246741	A1	2008-10-09	HINATA	Family of JP2008-276729A
	2	20100134137	A1	2010-06-03	KIDA	Corresponding to WO2008/136153A1

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

Application Number	
Filing Date	
First Named Inventor	Kouichi ANNO et al.
Art Unit	
Examiner Name	
Attorney Docket Number	0520-51700CX1CON

3	20090322704	A1	2009-12-31	Kouichi ANNO	
4	20060038580	A1	2006-02-23	Kenichi HASEGAWA et al.	
5	20100085320	A1	2010-04-08	Yuka KUWAJIMA et al.	
6	20080144023	A1	2008-06-19	Yukihiro SHIBATA et al.	

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

FOREIGN PATENT DOCUMENTS

Examiner Initial*	Cite No	Foreign Document Number ³	Country Code ²	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	2008-276729	JP	A	2008-11-13	EPSON IMAGING DEVICES CORP	with English Abstract, Family of US20080246741A1	☐
	2	2008-136153	WO	A1	2008-11-13	SHARP KABUSHIKI KAISHA	with English Abstract. Corresponding to US20100134137A1	☐
	3	2006038988	JP	A	2006-02-09	SEIKO EPSON CORP	with English Abstract	☐
	4	101620490	CN	A	2010-01-06	HITACHI DISPLAYS LTD		☐
	5	1725064	CN	A	2006-01-25	SEIKO EPSON CORP		☐

INFORMATION DISCLOSURE STATEMENT BY APPLICANT (Not for submission under 37 CFR 1.99)	Application Number			
	Filing Date			
	First Named Inventor	Kouichi ANNO et al.		
	Art Unit			
	Examiner Name			
	Attorney Docket Number	0520-51700CX1CON		

	6	2002-350896	JP	A	2002-12-04	ADVANCED DISPLAY KK		☐
	7	09-080478	JP	A	1997-03-28	Sharp Corp.		☐
	8	07-152043	JP	A	1995-06-16	Fujitsu Ltd.		☐
	9	10-2008-0055248	KR	A	2008-06-19	SAMSUNG ELECTRONICS CO LTD		☐
	10	07-056192	JP	A	1995-03-03	Fujitsu Ltd.		☐
	11	2009-53390	JP	A	2009-03-12	Epson Imaging Devices		☐
	12	2008/136153	WO	A	2008-11-13	Sharp KK.		☐

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

NON-PATENT LITERATURE DOCUMENTS

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	Office Action dated June 23, 2015 regarding a corresponding Japanese Patent Application No. 2014-066102	☒
	2	Translation of Office Action in connection with corresponding Chinese Application No. 2011101531803, dated August 01, 2013	☒

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

INFORMATION DISCLOSURE STATEMENT BY APPLICANT (Not for submission under 37 CFR 1.99)	Application Number		
	Filing Date		
	First Named Inventor	Kouichi ANNO et al.	
	Art Unit		
	Examiner Name		
	Attorney Docket Number	0520-51700CX1CON	

EXAMINER SIGNATURE			
Examiner Signature	/KENNETH B LEE JR/	Date Considered	03/19/2016
*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.			
<small> 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. </small>			

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

Application Number		
Filing Date		
First Named Inventor	Kouichi ANNO et al.	
Art Unit		
Examiner Name		
Attorney Docket Number	0520-51700CX1CON	

CERTIFICATION STATEMENT

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

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

OR

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

☐ See attached certification statement.

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

☒ A certification statement is not submitted herewith.

SIGNATURE

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

Signature	/Arimi Yamada/	Date (YYYY-MM-DD)	2016-01-25
Name/Print	Arimi Yamada	Registration Number	70156

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.

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

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



UNITED STATES PATENT AND TRADEMARK OFFICE

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

APPLICATION NUMBER	FILING OR 371(C) DATE	FIRST NAMED APPLICANT	ATTY. DOCKET NO./TITLE
15/005,737	01/25/2016	Kouichi ANNO	0520-51700CX1CON

CONFIRMATION NO. 7062

133303
TYPHA IP LLC
1819 L Street NW Suite 200
Washington, DC 20036

PUBLICATION NOTICE



OC00000083034525

Title:DISPLAY DEVICE

Publication No.US-2016-0139711-A1

Publication Date:05/19/2016

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 publicly available Searchable Databases via the Internet at www.uspto.gov. The direct link to access the publication is currently <http://www.uspto.gov/patft/>.

The publication process established by the Office does not provide for mailing a copy of the publication to applicant. A copy of the publication may be obtained from the Office upon payment of the appropriate fee set forth in 37 CFR 1.19(a)(1). Orders for copies of patent application publications are handled by the USPTO's Office of Public Records. The Office of Public Records can be reached by telephone at (703) 308-9726 or (800) 972-6382, by facsimile at (703) 305-8759, by mail addressed to the United States Patent and Trademark Office, Office of Public Records, Alexandria, VA 22313-1450 or via the Internet.

In addition, information on the status of the application, including the mailing date of Office actions and the dates of receipt of correspondence filed in the Office, may also be accessed via the Internet through the Patent Electronic Business Center at www.uspto.gov using the public side of the Patent Application Information and Retrieval (PAIR) system. The direct link to access this status information is currently <http://pair.uspto.gov/>. Prior to publication, such status information is confidential and may only be obtained by applicant using the private side of PAIR.

Further assistance in electronically accessing the publication, or about PAIR, is available by calling the Patent Electronic Business Center at 1-866-217-9197.

Office of Data Management, Application Assistance Unit (571) 272-4000, or (571) 272-4200, or 1-888-786-0101

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.

**TERMINAL DISCLAIMER TO OBVIATE A DOUBLE PATENTING
REJECTION OVER A "PRIOR" PATENT**Docket Number (Optional)
0520-51700CX1CON

In re Application of: Kouichi ANNO

Application No.: 15/005,737

Filed: 2016-01-25

For: DISPLAY DEVICE

The owner*, Japan Display Inc., Panasonic Liquid Crystal Display Co., LTD., of 100 percent interest in the instant application hereby disclaims, except as provided below, the terminal part of the statutory term of any patent granted on the instant application which would extend beyond the expiration date of the full statutory term **prior patent** No. 9,274,631 as the term of said prior patent is defined in 35 U.S.C. 154 and 173, and as the term of said **prior patent** is presently shortened by any terminal disclaimer. The owner hereby agrees that any patent so granted on the instant application shall be enforceable only for and during such period that it and the **prior patent** are commonly owned. This agreement runs with any patent granted on the instant application and is binding upon the grantee, its successors or assigns.

In making the above disclaimer, the owner does not disclaim the terminal part of the term of any patent granted on the instant application that would extend to the expiration date of the full statutory term as defined in 35 U.S.C. 154 and 173 of the **prior patent**, "as the term of said **prior patent** is presently shortened by any terminal disclaimer," in the event that said **prior patent** later:

- expires for failure to pay a maintenance fee;
- is held unenforceable;
- is found invalid by a court of competent jurisdiction;
- is statutorily disclaimed in whole or terminally disclaimed under 37 CFR 1.321;
- has all claims canceled by a reexamination certificate;
- is reissued; or
- is in any manner terminated prior to the expiration of its full statutory term as presently shortened by any terminal disclaimer.

Check either box 1 or 2 below, if appropriate.

1. ☐ For submissions on behalf of a business/organization (e.g., corporation, partnership, university, government agency, etc.), the undersigned is empowered to act on behalf of the business/organization.

I hereby declare that all statements made herein of my own knowledge are true and that all statements made on information and belief are believed to be true; and further that these statements were made with the knowledge that willful false statements and the like so made are punishable by fine or imprisonment, or both, under Section 1001 of Title 18 of the United States Code and that such willful false statements may jeopardize the validity of the application or any patent issued thereon.

2. ☒ The undersigned is an attorney or agent of record. Reg. No. 70156

/Arimi Yamada/
Signature

2016-06-20
Date

Arimi Yamada
Typed or printed name

Telephone Number

- ☒ Terminal disclaimer fee under 37 CFR 1.20(d) included.

WARNING: Information on this form may become public. Credit card information should not be included on this form. Provide credit card information and authorization on PTO-2038.

*Statement under 37 CFR 3.73(b) is required if terminal disclaimer is signed by the assignee (owner).
Form PTO/SB/96 may be used for making this certification. See MPEP § 324.

This collection of information is required by 37 CFR 1.321. The information is required to obtain or retain a benefit by the public which is to file (and by the USPTO to process) an application. Confidentiality is governed by 35 U.S.C. 122 and 37 CFR 1.11 and 1.14. This collection is estimated to take 12 minutes to complete, including gathering, preparing, and submitting the completed application form to the USPTO. Time will vary depending upon the individual case. Any comments on the amount of time you require to complete this form and/or suggestions for reducing this burden, should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, U.S. Department of Commerce, P.O. Box 1450, Alexandria, VA 22313-1450. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. SEND TO: Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450.

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

Privacy Act Statement

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

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

1. The information on this form will be treated confidentially to the extent allowed under the Freedom of Information Act (5 U.S.C. 552) and the Privacy Act (5 U.S.C. 552a). Records from this system of records may be disclosed to the Department of Justice to determine whether disclosure of these records is required by the Freedom of Information Act.
2. A record from this system of records may be disclosed, as a routine use, in the course of presenting evidence to a court, magistrate, or administrative tribunal, including disclosures to opposing counsel in the course of settlement negotiations.
3. A record in this system of records may be disclosed, as a routine use, to a Member of Congress submitting a request involving an individual, to whom the record pertains, when the individual has requested assistance from the Member with respect to the subject matter of the record.
4. A record in this system of records may be disclosed, as a routine use, to a contractor of the Agency having need for the information in order to perform a contract. Recipients of information shall be required to comply with the requirements of the Privacy Act of 1974, as amended, pursuant to 5 U.S.C. 552a(m).
5. A record related to an International Application filed under the Patent Cooperation Treaty in this system of records may be disclosed, as a routine use, to the International Bureau of the World Intellectual Property Organization, pursuant to the Patent Cooperation Treaty.
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.

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re Application of:	Kouichi ANNO	Confirmation No.:	7062
Application No.:	15/005,737	Examiner:	Lee Jr, Kenneth B
Filed:	January 25, 2016	Group Art Unit:	2697

For DISPLAY DEVICE

Commissioner for Patents
Alexandria, VA 22313-1450

RESPONSE UNDER 37 C.F.R. § 1.111

Dear Sir:

In response to the Office Action dated March 23, 2016, please amend this application as follows.

AMENDMENT AND PRESENTATION OF CLAIMS	2
REMARKS	9

AMENDMENT AND PRESENTATION OF CLAIMS

Please replace all prior claims in the present application with the following claims.

Claims

1. (Currently Amended) A display device comprising:

a coordinate input substrate having detection electrodes disposed in a detection region,
and first interconnects outside the detection region;

a protective plate on the coordinate input substrate;

a light shielding material which has an opening and is disposed between the coordinate
input substrate and the protective plate; and

a first flexible substrate electrically connected to the coordinate input substrate,
wherein the coordinate input substrate has a second interconnect, a first electrode, and a
second electrode,

wherein the second interconnect surrounds the detection region and is formed outside the
first interconnects,

wherein the first electrode is formed at one end of the second interconnect,

wherein the second electrode is formed at the other end of the second interconnect,

wherein the second interconnect is disposed along a peripheral edge of at least three sides
of the coordinate input substrate,

wherein a display region is surrounded by the second interconnect,

wherein the first electrode is electrically connected with a third electrode on the first
flexible substrate, or the second electrode is electrically connected with a fourth electrode on the
first flexible substrate,

wherein the opening of the light shielding material is larger than the display region and surrounds the display region, and

wherein the light shielding material overlaps the second interconnect along the peripheral edge of at least the three sides of the coordinate input substrate in a plan view.

2. (Original) The display device according to claim 1, further comprising a display panel having the display region,

wherein the coordinate input substrate is disposed between the display panel and the protective plate.

3. (Original) The display device according to claim 1, further comprising a first semiconductor chip,

wherein a third interconnect and the first semiconductor chip are disposed on the first flexible substrate,

wherein the third electrode is formed at one end of the third interconnect,

wherein a fifth electrode is formed at the other end of the third interconnect, and

wherein the first semiconductor chip doesn't overlap the third interconnect and the fifth electrode in a plan view.

4. (Original) The display device according to claim 3, wherein the first semiconductor chip drives the coordinate input substrate.

5. (Original) The display device according to claim 3, wherein the third interconnect extends from the third electrode to the fifth terminal along an edge of the first flexible substrate and is disposed between the first semiconductor chip and the edge of the first flexible substrate.

6. (Original) The display device according to claim 3, wherein a fourth interconnect is disposed on the first flexible substrate,

wherein the fourth electrode is formed at one end of the fourth interconnect,

wherein a sixth electrode is formed at the other end of the fourth interconnect,

wherein the first semiconductor chip is disposed between the third interconnect and the fourth interconnect in plan view, and

wherein the first semiconductor chip doesn't overlap the fourth interconnect and the sixth terminal in a plan view.

7. (Original) The display device according to claim 3, wherein the first flexible substrate supplies driving signals to the detection electrodes via the first interconnects and receives detection signals corresponding to a contact position from the detection electrodes.

8. (Original) The display device according to claim 2, wherein the display panel comprises:

a first substrate on which a plurality of video signal lines and a plurality of scanning signal lines intersecting the video signal lines are formed; and

a second flexible substrate electrically connected to the first substrate,

wherein a plurality of seventh electrodes, a fifth interconnect, an eighth electrode and ninth electrode are formed on the first substrate,

wherein the seventh electrodes receive video signals and scanning signals from an external system, the eighth electrode is formed at one end of the fifth interconnect, and the ninth electrode formed at the other end of the fifth interconnect,

wherein a plurality of tenth electrodes, a eleventh electrode, twelfth electrode are formed on the second flexible substrate, and the plurality of tenth electrodes are formed between the eleventh electrode and the twelfth electrode,

wherein the tenth electrodes are connected to the seventh electrodes, the eleventh electrode is connected to the eighth electrode, the twelfth electrode is connected to the ninth electrode, and

wherein the fifth interconnect is disposed along a peripheral edge of at least three sides of the first substrate.

9. (Original) The display device according to claim 8, wherein the display panel further comprises a second semiconductor chip receiving the video signals, supplying display signals to the video signal lines, and controlling the video signal lines and the scanning signal lines,

wherein the second semiconductor chip is formed on the first substrate and is surrounded by the fifth interconnect.

10. (Original) The display device according to claim 1, wherein the opening of the light shielding material is smaller than the detection region of the coordinate input substrate.

11. (Original) The display device according to claim 1, further comprising:

a sixth interconnect surrounds the detection region and is formed outside the first interconnects,

wherein the sixth interconnect is electrically connected with the first flexible substrate,
and

wherein the sixth interconnect is disposed along a peripheral edge of at least three sides
of the coordinate input substrate.

12. (Original) A coordinate input device comprising:

a coordinate input substrate having detection electrodes disposed in a detection region,
and first interconnects outside the detection region; and

a first flexible substrate electrically connected to the coordinate input substrate,

wherein the coordinate input substrate has a second interconnect, a first electrode, and a
second electrode,

wherein the second interconnect surrounds the detection region and is formed outside the
first interconnects,

wherein the first electrode is formed at one end of the second interconnect,

wherein the second electrode is formed at the other end of the second interconnect,

wherein the second interconnect is disposed along a peripheral edge of at least three sides
of the coordinate input substrate, and

wherein the first electrode is electrically connected with a third electrode on the first
flexible substrate, or the second electrode is electrically connected with a fourth electrode on the
first flexible substrate.

13. (Original) The coordinate input device according to claim 12, further comprising a
first semiconductor chip,

wherein a third interconnect and the first semiconductor chip are disposed on the first flexible substrate,

wherein the third electrode is formed at one end of the third interconnect,

wherein a fifth electrode is formed at the other end of the third interconnect, and

wherein the first semiconductor chip doesn't overlap the third interconnect and the fifth electrode in a plan view.

14. (Original) The coordinate input device according to claim 13,

wherein the first semiconductor chip drives the coordinate input substrate.

15. (Original) The coordinate input device according to claim 13,

wherein the third interconnect extends from the third electrode to the fifth electrode along an edge of the first flexible substrate and is disposed between the first semiconductor chip and the edge of the first flexible substrate.

16. (Original) The coordinate input device according to claim 13,

wherein a fourth interconnect is disposed on the first flexible, substrate,

wherein the fourth electrode is formed at one end of the fourth interconnect,

wherein a sixth electrode is formed at the other end of the fourth interconnect,

wherein the first semiconductor chip is disposed between the third interconnect and the fourth interconnect in plan view, and

wherein the first semiconductor chip doesn't overlap the sixth electrode and the fourth interconnect in plan view.

17. (Original) The coordinate input device according to claim 12,
wherein the opening of the light shielding material is smaller than the detection region of
the coordinate input substrate.

18. (Original) The coordinate input device according to claim 17,
wherein the first flexible substrate supplies driving signals to the detection electrodes via
the first interconnects and receives detection signals corresponding to a contact position from the
detection electrodes.

19. (Original) The coordinate input device according to claim 12, further comprising:
a sixth interconnect surrounds the detection region and is formed outside the first
interconnects,
wherein the sixth interconnect is electrically connected with the first flexible substrate,
and
wherein sixth interconnect is disposed along a peripheral edge of at least three sides of the
coordinate input substrate.

20. (New) The display device according to claim 1, wherein
a detection signal is supplied to the first flexible substrate via one of the first interconnect.

21. (New) The coordinate input device according to claim 12, wherein
a detection signal is supplied to the first flexible substrate via one of the first interconnect.

REMARKS

By this amendment, claims 1-21 are pending. Claim 1 is currently amended, and claims 20-21 are newly presented. The amendments and new claims are fully supported by the original disclosure. Applicant has amended claim 1 to correct a typographical error, which is supported, for example, in paragraph 15 of the specification. Support for the new claims 20-21 includes pages 4, paragraph 20 of the specification. No new matter is introduced.

The Office Action mailed March 23, 2016, rejected claims 1-19 on the ground of nonstatutory double patenting over claims 13-29 of U.S. Patent No. 9,274,631. The rejection is respectfully traversed.

Rejection of Claims 1-19

The Office rejected claims 1-19 on the ground of nonstatutory double patenting over claims 13-29 of U.S. Patent No. 9,274,631. Applicant respectfully disagrees.

In order to expedite the prosecution, however, Applicant respectfully submit a terminal disclosure herewith. Thus, Applicant respectfully requests that the rejection of claims 1-19 be withdrawn.

New claims 20-21

As explained above, newly presented claims 20-21 are fully supported by the original disclosure. Claim 20, which depends originally from claim 1, is in allowable condition at least for the reason claim 1 is patentable. In addition, claim 21, which depends originally from claim 12, is in allowable condition at least for the reason claim 12 is patentable.

Accordingly, consideration and allowance of claims 20-21 are respectfully requested.

Conclusion

Therefore, the present application, as amended, overcomes the rejections of record and is in condition for allowance. Favorable consideration is respectfully requested.

To the extent necessary, a petition for an extension of time under 37 C.F.R. § 1.136 is hereby made. Please charge any shortage in fees due in connection with the filing of this paper, including extension of time fees, to Deposit Account 506785 and please credit any excess fees to such deposit account.

Respectfully submitted,
TYPHA IP LLC

/Arimi Yamada/

Arimi Yamada
Registration No. 70,156

Customer No.: 133303
1819 L STREET NW SUITE 200
WASHINGTON, DC 20036
TEL: (202)-800-8679
FAX: (202)-654-5728
Dated: June 20, 2016

Electronic Patent Application Fee Transmittal				
Application Number:		15005737		
Filing Date:		25-Jan-2016		
Title of Invention:		DISPLAY DEVICE		
First Named Inventor/Applicant Name:		Kouichi ANNO		
Filer:		Arimi Yamada/Jacob Lieber		
Attorney Docket Number:		0520-51700CX1CON		
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:				
Claims in Excess of 20	1202	1	80	80
Miscellaneous-Filing:				
Petition:				
Patent-Appeals-and-Interference:				
Post-Allowance-and-Post-Issuance:				

Description	Fee Code	Quantity	Amount	Sub-Total in USD(\$)
Extension-of-Time:				
Miscellaneous:				
Statutory or Terminal Disclaimer	1814	1	160	160
Total in USD (\$)				240

Electronic Acknowledgement Receipt

EFS ID:	26111869
Application Number:	15005737
International Application Number:	
Confirmation Number:	7062
Title of Invention:	DISPLAY DEVICE
First Named Inventor/Applicant Name:	Kouichi ANNO
Customer Number:	133303
Filer:	Arimi Yamada
Filer Authorized By:	
Attorney Docket Number:	0520-51700CX1CON
Receipt Date:	20-JUN-2016
Filing Date:	25-JAN-2016
Time Stamp:	13:45:23
Application Type:	Utility under 35 USC 111(a)

Payment information:

Submitted with Payment	yes
Payment Type	Credit Card
Payment was successfully received in RAM	\$ 240
RAM confirmation Number	33
Deposit Account	506785
Authorized User	YAMADA, ARIMI
The Director of the USPTO is hereby authorized to charge indicated fees and credit any overpayment as follows: Charge any Additional Fees required under 37 CFR 1.16 (National application filing, search, and examination fees) Charge any Additional Fees required under 37 CFR 1.17 (Patent application and reexamination processing fees)	

Charge any Additional Fees required under 37 CFR 1.19 (Document supply fees)

Charge any Additional Fees required under 37 CFR 1.20 (Post Issuance fees)

Charge any Additional Fees required under 37 CFR 1.21 (Miscellaneous fees and charges)

File Listing:

Document Number	Document Description	File Name	File Size(Bytes)/ Message Digest	Multi Part /.zip	Pages (if appl.)
1	Terminal Disclaimer Filed	0520-51700CX1CON_TermDisclaimerPriorPat_cu.pdf	283735 ad7fe80dc3c227d1a7a6d8961e8bd3f9b0d8d012	no	2

Warnings:

Information:

2		0520-51700CX1CON_ResponseNonFOAmailed2016-03-23_cu.pdf	52420 3297de0939f77af9308191f428ed0a3cf08ae8e3	yes	10
---	--	--	---	-----	----

Multipart Description/PDF files in .zip description

Document Description	Start	End
Amendment/Req. Reconsideration-After Non-Final Reject	1	1
Claims	2	8
Applicant Arguments/Remarks Made in an Amendment	9	10

Warnings:

Information:

3	Fee Worksheet (SB06)	fee-info.pdf	31932 a30ad06846c54d5e774b83580385d7ae80a8b255	no	2
---	----------------------	--------------	---	----	---

Warnings:

Information:

Total Files Size (in bytes): 368087

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.

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

PATENT APPLICATION FEE DETERMINATION RECORD Substitute for Form PTO-875				Application or Docket Number 15/005,737		Filing Date 01/25/2016		☐ To be Mailed	
---	--	--	--	---	--	----------------------------------	--	---------------------------------------	--

ENTITY: ☒ **LARGE** ☐ **SMALL** ☐ **MICRO**

APPLICATION AS FILED – PART I

FOR	NUMBER FILED (Column 1)	NUMBER EXTRA (Column 2)		RATE (\$)	FEE (\$)
☐ BASIC FEE (37 CFR 1.16(a), (b), or (c))	N/A	N/A		N/A	
☐ SEARCH FEE (37 CFR 1.16(k), (l), or (m))	N/A	N/A		N/A	
☐ EXAMINATION FEE (37 CFR 1.16(o), (p), or (q))	N/A	N/A		N/A	
TOTAL CLAIMS (37 CFR 1.16(j))	minus 20 =	*		X \$ =	
INDEPENDENT CLAIMS (37 CFR 1.16(h))	minus 3 =	*		X \$ =	
☐ APPLICATION SIZE FEE (37 CFR 1.16(s))	If the specification and drawings exceed 100 sheets of paper, the application size fee due is \$310 (\$155 for small entity) for each additional 50 sheets or fraction thereof. See 35 U.S.C. 41(a)(1)(G) and 37 CFR 1.16(s).				
☐ MULTIPLE DEPENDENT CLAIM PRESENT (37 CFR 1.16(j))					
* If the difference in column 1 is less than zero, enter "0" in column 2.				TOTAL	

APPLICATION AS AMENDED – PART II

	(Column 1)	(Column 2)	(Column 3)		RATE (\$)	ADDITIONAL FEE (\$)
AMENDMENT	06/20/2016	CLAIMS REMAINING AFTER AMENDMENT		HIGHEST NUMBER PREVIOUSLY PAID FOR	PRESENT EXTRA	
	Total (37 CFR 1.16(i))	* 21	Minus	** 20	= 1	X \$80 = 80
	Independent (37 CFR 1.16(h))	* 2	Minus	*** 3	= 0	X \$420 = 0
	☐ Application Size Fee (37 CFR 1.16(s))					
	☐ FIRST PRESENTATION OF MULTIPLE DEPENDENT CLAIM (37 CFR 1.16(j))					
TOTAL ADD'L FEE						80

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

* If the entry in column 1 is less than the entry in column 2, write "0" in column 3.
 ** If the "Highest Number Previously Paid For" IN THIS SPACE is less than 20, enter "20".
 *** If the "Highest Number Previously Paid For" IN THIS SPACE is less than 3, enter "3".
 The "Highest Number Previously Paid For" (Total or Independent) is the highest number found in the appropriate box in column 1.

LIE
 /PARTHENIA D. MERRILL/

This collection of information is required by 37 CFR 1.16. The information is required to obtain or retain a benefit by the public which is to file (and by the USPTO to process) an application. Confidentiality is governed by 35 U.S.C. 122 and 37 CFR 1.14. This collection is estimated to take 12 minutes to complete, including gathering, preparing, and submitting the completed application form to the USPTO. Time will vary depending upon the individual case. Any comments on the amount of time you require to complete this form and/or suggestions for reducing this burden, should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, U.S. Department of Commerce, P.O. Box 1450, Alexandria, VA 22313-1450. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. **SEND TO: Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450.**

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

Application Number 	Application/Control No. 15/005,737	Applicant(s)/Patent under Reexamination ANNO ET AL.	
Document Code - DISQ		Internal Document – DO NOT MAIL	

TERMINAL DISCLAIMER	☒ APPROVED	☐ DISAPPROVED
Date Filed : 6/20/16	This patent is subject to a Terminal Disclaimer	

Approved/Disapproved by:
ANDRE ROBINSON

U.S. Patent and Trademark Office



UNITED STATES PATENT AND TRADEMARK OFFICE

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

NOTICE OF ALLOWANCE AND FEE(S) DUE

133303 7590 09/09/2016
TYPHA IP LLC
1819 L Street NW Suite 200
Washington, DC 20036

EXAMINER

LEE JR, KENNETH B

ART UNIT

PAPER NUMBER

2697

DATE MAILED: 09/09/2016

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
-----------------	-------------	----------------------	---------------------	------------------

15/005,737

01/25/2016

Kouichi ANNO

0520-51700CX1CON

7062

TITLE OF INVENTION: DISPLAY DEVICE

APPLN. TYPE	ENTITY STATUS	ISSUE FEE DUE	PUBLICATION FEE DUE	PREV. PAID ISSUE FEE	TOTAL FEE(S) DUE	DATE DUE
nonprovisional	UNDISCOUNTED	\$960	\$0	\$0	\$960	12/09/2016

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

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

HOW TO REPLY TO THIS NOTICE:

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

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

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

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

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

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

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

PART B - FEE(S) TRANSMITTAL

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

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

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

133303 7590 09/09/2016
TYPHA IP LLC
1819 L Street NW Suite 200
Washington, DC 20036

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

Certificate of Mailing or Transmission

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

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

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
15/005,737	01/25/2016	Kouchi ANNO	0520-51700CX1CON	7062

TITLE OF INVENTION: DISPLAY DEVICE

APPLN. TYPE	ENTITY STATUS	ISSUE FEE DUE	PUBLICATION FEE DUE	PREV. PAID ISSUE FEE	TOTAL FEE(S) DUE	DATE DUE
nonprovisional	UNDISCOUNTED	\$960	\$0	\$0	\$960	12/09/2016

EXAMINER	ART UNIT	CLASS-SUBCLASS
LEE JR, KENNETH B	2697	345-174000

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

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

2. For printing on the patent front page, list

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

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

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

(A) NAME OF ASSIGNEE

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

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

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

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

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

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

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

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

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

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

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

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

Authorized Signature _____ Date _____
Typed or printed name _____ Registration No. _____



UNITED STATES PATENT AND TRADEMARK OFFICE

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

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
15/005,737	01/25/2016	Kouichi ANNO	0520-51700CX1CON	7062
133303 7590 09/09/2016 TYPHA IP LLC 1819 L Street NW Suite 200 Washington, DC 20036			EXAMINER LEE JR, KENNETH B	
			ART UNIT 2697	PAPER NUMBER
DATE MAILED: 09/09/2016				

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

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

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

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

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

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

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

Privacy Act Statement

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

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

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

Notice of Allowability	Application No. 15/005,737	Applicant(s) ANNO ET AL.	
	Examiner KENNETH B. LEE JR	Art Unit 2697	AIA (First Inventor to File) 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 remarks filed 6/20/2016.
☐ 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 1-21. As a result of the allowed claim(s), you may be eligible to benefit from the **Patent Prosecution Highway** program at a participating intellectual property office for the corresponding application. For more information, please see http://www.uspto.gov/patents/init_events/pph/index.jsp or send an inquiry to PPHfeedback@uspto.gov.
4. ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

Certified copies:

- a) ☒ All b) ☐ Some *c) ☐ None of the:

1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this national stage application from the International Bureau (PCT Rule 17.2(a)).

* Certified copies not received: _____.

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

5. ☐ CORRECTED DRAWINGS (as "replacement sheets") must be submitted.
☐ including changes required by the attached Examiner's Amendment / Comment or in the Office action of Paper No./Mail Date _____.
Identifying indicia such as the application number (see 37 CFR 1.84(c)) should be written on the drawings in the front (not the back) of each sheet. Replacement sheet(s) should be labeled as such in the header according to 37 CFR 1.121(d).
6. ☐ DEPOSIT OF and/or INFORMATION about the deposit of BIOLOGICAL MATERIAL must be submitted. Note the attached Examiner's comment regarding REQUIREMENT FOR THE DEPOSIT OF BIOLOGICAL MATERIAL.

Attachment(s)

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

/KENNETH B LEE JR/
Primary Examiner, Art Unit 2697

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

DETAILED ACTION

Allowable Subject Matter

2. Claims 1-21 are allowed.
3. The following is an examiner's statement of reasons for allowance: The Terminal Disclaimer filed 7/8/2016 has placed the application in condition for allowance.

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 KENNETH B. LEE JR whose telephone number is (571)270-3147. The examiner can normally be reached on Mon. - Fri. 7:30AM - 4:00 PM EST.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Alexander Eisen can be reached on 571-272-7687. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Art Unit: 2697

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.

/KENNETH B LEE JR/
Primary Examiner
Art Unit 2697

Search Notes 	Application/Control No. 15005737	Applicant(s)/Patent Under Reexamination ANNO ET AL.
	Examiner KENNETH B LEE JR	Art Unit 2697

CPC- SEARCHED		
Symbol	Date	Examiner
G06F	9/2016	KBL

CPC COMBINATION SETS - SEARCHED		
Symbol	Date	Examiner

US CLASSIFICATION SEARCHED			
Class	Subclass	Date	Examiner
EAST	Keyword Search	9/2016	KBL

SEARCH NOTES		
Search Notes	Date	Examiner
USPGPUB;USPAT;USOCR;EPO;JPO	9/2016	KBL
Inventor Search (Anno et al.)	9/2016	KBL

INTERFERENCE SEARCH			
US Class/ CPC Symbol	US Subclass / CPC Group	Date	Examiner
G06F3	041,0412	9/2016	KBL

--	--

Issue Classification 	Application/Control No. 15005737	Applicant(s)/Patent Under Reexamination ANNO ET AL.	
	Examiner KENNETH B LEE JR	Art Unit 2697	

CPC						
Symbol					Type	Version
G06F		3		044	F	2013-01-01
G06F		3		041	I	2013-01-01
G06F		3		0412	I	2013-01-01
G06F		2203		04103	A	2013-01-01

CPC Combination Sets							
Symbol				Type	Set	Ranking	Version

NONE		Total Claims Allowed:	
(Assistant Examiner)	(Date)	21	
/KENNETH B LEE JR/ Primary Examiner.Art Unit 2697	09/06/2016	O.G. Print Claim(s)	O.G. Print Figure
(Primary Examiner)	(Date)	1	3

EAST Search History

EAST Search History (Prior Art)

Ref #	Hits	Search Query	DBs	Default Operator	Plurals	Time Stamp
L1	8759	G06F3/044	US-PGPUB; USPAT; USOCR; EPO; JPO	OR	OFF	2016/09/06 14:06
L2	34072	G06F3/041	US-PGPUB; USPAT; USOCR; EPO; JPO	OR	OFF	2016/09/06 14:06
L3	3322	G06F3/0412	US-PGPUB; USPAT; USOCR; EPO; JPO	OR	OFF	2016/09/06 14:06
L4	1159	G06F2203/04103	US-PGPUB; USPAT; USOCR; EPO; JPO	OR	OFF	2016/09/06 14:06
L5	38129	1 2 3 4	US-PGPUB; USPAT; USOCR; EPO; JPO	OR	OFF	2016/09/06 14:07
L6	4	5 and (coordinate adj2 input adj2 substrate\$1)	US-PGPUB; USPAT; USOCR; EPO; JPO	OR	OFF	2016/09/06 14:08
L7	2	6 and (interconnect\$1)	US-PGPUB; USPAT; USOCR; EPO; JPO	OR	OFF	2016/09/06 14:09
L8	2	7 and (light adj shielding)	US-PGPUB; USPAT; USOCR; EPO; JPO	OR	OFF	2016/09/06 14:09
L9	2	7 and (light adj shield\$3)	US-PGPUB;	OR	OFF	2016/09/06 14:10

			USPAT; USOCR; EPO; JPO			
L10	1161	5 and (coordinate adj2 input)	US- PGPUB; USPAT; USOCR; EPO; JPO	OR	OFF	2016/09/06 14:10
L11	43	10 and (interconnect\$1)	US- PGPUB; USPAT; USOCR; EPO; JPO	OR	OFF	2016/09/06 14:10
L12	3	11 and (light adj shield\$3)	US- PGPUB; USPAT; USOCR; EPO; JPO	OR	OFF	2016/09/06 14:10
L13	83	((KOUICHI) near2 (ANNO)).INV.	US- PGPUB; USPAT; USOCR	OR	OFF	2016/09/06 14:11
L14	55	((TAKUMI) near2 (SATO)).INV.	US- PGPUB; USPAT; USOCR	OR	OFF	2016/09/06 14:11
L15	42	((MASAHIRO) near2 (TERAMOTO)).INV.	US- PGPUB; USPAT; USOCR	OR	OFF	2016/09/06 14:11
L16	166	L13 L14 L15	US- PGPUB; USPAT; USOCR	OR	OFF	2016/09/06 14:11
S1	1	("20120139829").PN.	US- PGPUB; USPAT; USOCR; EPO; JPO	OR	OFF	2013/05/22 09:39
S2	15932	(345/156,204).OCLS.	US- PGPUB; USPAT; USOCR; EPO; JPO	OR	OFF	2013/05/22 10:05
S3	2	S2 and (interconnect adj2 defect)	US- PGPUB; USPAT; USOCR; EPO; JPO	OR	OFF	2013/05/22 11:37
S4	104	(interconnect adj2 defect)	US- PGPUB; USPAT; USOCR;	OR	OFF	2013/05/22 11:38

			EPO; JPO			
S5	15	S4 and (visual adj2 inspection)	US- PGPUB; USPAT; USOCR; EPO; JPO	OR	OFF	2013/05/22 11:38
S6	12	S2 and (signal adj2 interconnect)	US- PGPUB; USPAT; USOCR; EPO; JPO	OR	OFF	2013/05/22 11:47
S7	1	S6 and (inspection)	US- PGPUB; USPAT; USOCR; EPO; JPO	OR	OFF	2013/05/22 11:47
S8	3632	(signal adj2 interconnect)	US- PGPUB; USPAT; USOCR; EPO; JPO	OR	OFF	2013/05/22 11:47
S9	181	S8 and (inspection)	US- PGPUB; USPAT; USOCR; EPO; JPO	OR	OFF	2013/05/22 11:48
S10	16	S9 and (liquid adj2 crystal)	US- PGPUB; USPAT; USOCR; EPO; JPO	OR	OFF	2013/05/22 11:48
S11	15932	(345/156,204).OCLS.	US- PGPUB; USPAT; USOCR; EPO; JPO	OR	OFF	2013/05/22 20:55
S12	14	(signal adj2 interconnect) same (inspection)	US- PGPUB; USPAT; USOCR; EPO; JPO	OR	OFF	2013/05/22 20:58
S13	35	S11 and (detect\$3 same (short\$1circuit))	US- PGPUB; USPAT; USOCR; EPO; JPO	OR	OFF	2013/05/22 21:03
S14	23	S13 and (liquid adj2 crystal)	US- PGPUB; USPAT; USOCR;	OR	OFF	2013/05/22 21:04

			EPO; JPO			
S15	3632	(signal adj2 interconnect)	US- PGPUB; USPAT; USOCR; EPO; JPO	OR	OFF	2013/05/22 21:12
S16	3	S15 and (test same (chipping cracking))	US- PGPUB; USPAT; USOCR; EPO; JPO	OR	OFF	2013/05/22 21:12
S17	0	S11 and (pixel\$1 same terminal\$1 same inspection same (chipping cracking))	US- PGPUB; USPAT; USOCR; EPO; JPO	OR	OFF	2013/05/22 21:48
S18	0	(pixel\$1 same terminal\$1 same inspection same (chipping cracking))	US- PGPUB; USPAT; USOCR; EPO; JPO	OR	OFF	2013/05/22 21:49
S19	0	(pixel\$1 same terminal\$1 same inspect\$3 same (chipping cracking))	US- PGPUB; USPAT; USOCR; EPO; JPO	OR	OFF	2013/05/22 21:50
S20	21	(detect\$3 same terminal\$1 same inspect\$3 same (chipping cracking))	US- PGPUB; USPAT; USOCR; EPO; JPO	OR	OFF	2013/05/22 21:50
S21	1	S20 and (liquid adj2 crystal)	US- PGPUB; USPAT; USOCR; EPO; JPO	OR	OFF	2013/05/22 21:50
S22	0	S11 and (pixel adj2 region) same (terminal adj2 region)	US- PGPUB; USPAT; USOCR; EPO; JPO	OR	OFF	2013/05/22 23:00
S23	4	S11 and (pixel adj2 region) same (flexible adj2 printed)	US- PGPUB; USPAT; USOCR; EPO; JPO	OR	OFF	2013/05/22 23:01
S24	2	S11 and (pixel adj2 region) same (inspection)	US- PGPUB; USPAT; USOCR;	OR	OFF	2013/05/22 23:04

			EPO; JPO			
S25	0	S11 and (inspection adj2 wiring) same (peripheral)	US-PGPUB; USPAT; USOCR; EPO; JPO	OR	OFF	2013/05/22 23:12
S26	14	S11 and (liquid adj2 crystal adj2 device) and (inspection adj2 (signal wiring terminal))	US-PGPUB; USPAT; USOCR; EPO; JPO	OR	OFF	2013/05/22 23:12
S27	17146	(345/156,204).CCLS.	US-PGPUB; USPAT; USOCR; EPO; JPO	OR	OFF	2013/11/19 13:05
S28	14	(signal adj2 interconnect) same (inspection)	US-PGPUB; USPAT; USOCR; EPO; JPO	OR	OFF	2013/11/19 13:05
S29	44944	(345/156-173,204).CCLS.	US-PGPUB; USPAT; USOCR; EPO; JPO	OR	OFF	2013/11/19 13:48
S30	4991	(substrate adj test)	US-PGPUB; USPAT; USOCR; EPO; JPO	OR	OFF	2013/11/19 13:51
S31	521	S30 AND (H01L22/34 OR H01L22/32 OR H01L22/14 OR H01L22/12 OR H01L22/20 OR H01L22/30 OR H01L21/02491 OR H01L21/02527 OR H01L21/0262 OR H01L21/28 OR H01L21/324 OR H01L21/67017 OR H01L21/6719 OR H01L21/67346 OR H01L21/67748 OR H01L21/67769 OR H01L21/67775 OR H01L21/76841 OR H01L2224/0237 OR H01L2224/02372 OR H01L2224/13025 OR H01L2224/13144 OR H01L2224/13147 OR H01L2224/16146 OR H01L2224/16155 OR H01L2224/81193 OR H01L2225/06513 OR H01L2225/06517 OR H01L2225/06541 OR H01L2225/06596 OR H01L22/10 OR H01L22/26 OR H01L23/38 OR H01L23/48 OR H01L23/498 OR H01L23/522 OR H01L24/00 OR H01L24/02 OR H01L24/13 OR H01L24/16 OR H01L25/0657 OR H01L25/50 OR H01L2924/01005 OR H01L2924/01006 OR H01L2924/01029 OR H01L2924/01033 OR H01L2924/01079 OR H01L2924/014 OR H01L29/1606 OR H01L29/49 OR H01L29/66833 OR H01L29/792).CPC.)	US-PGPUB; USPAT; USOCR; EPO; JPO	OR	OFF	2013/11/19 13:53

S32	6	S31 and ((chip\$4 crack\$3) with pass\$3 with fail\$3)	US-PGPUB; USPAT; USOCR; EPO; JPO	OR	OFF	2013/11/19 13:54
S33	121	S31 and (inspection)	US-PGPUB; USPAT; USOCR; EPO; JPO	OR	OFF	2013/11/19 13:57
S34	55	S33 and display	US-PGPUB; USPAT; USOCR; EPO; JPO	OR	OFF	2013/11/19 13:58
S35	67	S31 and (inspection with substrate)	US-PGPUB; USPAT; USOCR; EPO; JPO	OR	OFF	2013/11/19 14:16
S36	44944	(345/156-173,204).OCLS.	US-PGPUB; USPAT; USOCR; EPO; JPO	OR	OFF	2013/11/19 15:26
S37	4991	(substrate adj test)	US-PGPUB; USPAT; USOCR; EPO; JPO	OR	OFF	2013/11/19 15:26
S38	521	S37 AND ((H01L22/34 OR H01L22/32 OR H01L22/14 OR H01L22/12 OR H01L22/20 OR H01L22/30 OR H01L21/02491 OR H01L21/02527 OR H01L21/0262 OR H01L21/28 OR H01L21/324 OR H01L21/67017 OR H01L21/6719 OR H01L21/67346 OR H01L21/67748 OR H01L21/67769 OR H01L21/67775 OR H01L21/76841 OR H01L2224/0237 OR H01L2224/02372 OR H01L2224/13025 OR H01L2224/13144 OR H01L2224/13147 OR H01L2224/16146 OR H01L2224/16155 OR H01L2224/81193 OR H01L2225/06513 OR H01L2225/06517 OR H01L2225/06541 OR H01L2225/06596 OR H01L22/10 OR H01L22/26 OR H01L23/38 OR H01L23/48 OR H01L23/498 OR H01L23/522 OR H01L24/00 OR H01L24/02 OR H01L24/13 OR H01L24/16 OR H01L25/0657 OR H01L25/50 OR H01L2924/01005 OR H01L2924/01006 OR H01L2924/01029 OR H01L2924/01033 OR H01L2924/01079 OR H01L2924/014 OR H01L29/1606 OR H01L29/49 OR H01L29/66833 OR H01L29/792).CPC.)	US-PGPUB; USPAT; USOCR; EPO; JPO	OR	OFF	2013/11/19 15:26
S39	45464	S36 S38	US-	OR	OFF	2013/11/19

			PGPUB; USPAT; USOCR; EPO; JPO			15:26
S40	31	S39 and (substrate with flexible with electrode with terminal\$1)	US- PGPUB; USPAT; USOCR; EPO; JPO	OR	OFF	2013/11/19 15:27
S41	4	S40 and (inspection test)	US- PGPUB; USPAT; USOCR; EPO; JPO	OR	OFF	2013/11/19 15:50
S42	7	S39 and (electrode\$1 with terminal with display with (inspection test))	US- PGPUB; USPAT; USOCR; EPO; JPO	OR	OFF	2013/11/19 16:15
S43	62	((KOUICHI) near2 (ANNO)).INV.	US- PGPUB; USPAT; USOCR	OR	OFF	2013/11/19 16:17
S44	32	((TAKUMI) near2 (SATO)).INV.	US- PGPUB; USPAT; USOCR	OR	OFF	2013/11/19 16:17
S45	22	((MASAHIRO) near2 (TERAMOTO)).INV.	US- PGPUB; USPAT; USOCR	OR	OFF	2013/11/19 16:17
S46	112	S43 S44 S45	US- PGPUB; USPAT; USOCR; EPO; JPO	OR	OFF	2013/11/19 16:17
S52	5296	(substrate adj test)	US- PGPUB; USPAT; USOCR; EPO; JPO	OR	OFF	2014/09/24 23:32
S53	558	S52 AND ((H01L22/34 OR H01L22/32 OR H01L22/14 OR H01L22/12 OR H01L22/20 OR H01L22/30 OR H01L21/02491 OR H01L21/02527 OR H01L21/0262 OR H01L21/28 OR H01L21/324 OR H01L21/67017 OR H01L21/6719 OR H01L21/67346 OR H01L21/67748 OR H01L21/67769 OR H01L21/67775 OR H01L21/76841 OR H01L2224/0237 OR H01L2224/02372 OR H01L2224/13025 OR H01L2224/13144 OR H01L2224/13147 OR H01L2224/16146 OR H01L2224/16155 OR H01L2224/81193 OR H01L2225/06513 OR H01L2225/06517 OR H01L2225/06541 OR	US- PGPUB; USPAT; USOCR; EPO; JPO	OR	OFF	2014/09/24 23:32

		H01L2225/06596 OR H01L22/10 OR H01L22/26 OR H01L23/38 OR H01L23/48 OR H01L23/498 OR H01L23/522 OR H01L24/00 OR H01L24/02 OR H01L24/13 OR H01L24/16 OR H01L25/0657 OR H01L25/50 OR H01L2924/01005 OR H01L2924/01006 OR H01L2924/01029 OR H01L2924/01033 OR H01L2924/01079 OR H01L2924/014 OR H01L29/1606 OR H01L29/49 OR H01L29/66833 OR H01L29/792).CPC.)				
S54	2	((("20090322704") or ("20060038580")).PN.	US- PGPUB; USPAT; USOCR	OR	OFF	2014/09/24 23:33
S55	28736	G06F3/041	US- PGPUB; USPAT; USOCR; EPO; JPO	OR	OFF	2015/10/17 13:16
S56	1	S55 and (signal adj2 interconnect) same (inspection)	US- PGPUB; USPAT; USOCR; EPO; JPO	OR	OFF	2015/10/17 13:16
S57	28736	G06F3/041	US- PGPUB; USPAT; USOCR; EPO; JPO	OR	OFF	2015/10/17 16:34
S58	535	S57 and (flexible adj substrate)	US- PGPUB; USPAT; USOCR; EPO; JPO	OR	OFF	2015/10/17 16:34
S59	31	S58 and (light adj shielding)	US- PGPUB; USPAT; USOCR; EPO; JPO	OR	OFF	2015/10/17 16:34
S60	5	S59 and (surround\$3 adj2 display)	US- PGPUB; USPAT; USOCR; EPO; JPO	OR	OFF	2015/10/17 16:35
S61	14	S59 and (peripheral)	US- PGPUB; USPAT; USOCR; EPO; JPO	OR	OFF	2015/10/17 16:35
S62	16	S60 S61	US- PGPUB; USPAT; USOCR; EPO;	OR	OFF	2015/10/17 16:35

			JPO			
S63	5	S62 and (signal adj line\$1)	US-PGPUB; USPAT; USOCR; EPO; JPO	OR	OFF	2015/10/17 16:36
S64	2	S61 and (interconnect\$1)	US-PGPUB; USPAT; USOCR; EPO; JPO	OR	OFF	2015/10/17 16:36
S65	5	S63 S64	US-PGPUB; USPAT; USOCR; EPO; JPO	OR	OFF	2015/10/17 16:36
S66	74	((KOUICHI) near2 (ANNO)).INV.	US-PGPUB; USPAT; USOCR	OR	OFF	2015/10/17 18:43
S67	50	((TAKUMI) near2 (SATO)).INV.	US-PGPUB; USPAT; USOCR	OR	OFF	2015/10/17 18:43
S68	34	((MASAHIRO) near2 (TERAMOTO)).INV.	US-PGPUB; USPAT; USOCR	OR	OFF	2015/10/17 18:43
S69	148	S66 S67 S68	US-PGPUB; USPAT; USOCR	OR	OFF	2015/10/17 18:43
S75	1	("20140225849").PN.	US-PGPUB; USPAT; USOCR	OR	OFF	2015/10/18 16:59

EAST Search History (Interference)

Ref #	Hits	Search Query	DBs	Default Operator	Plurals	Time Stamp
L17	7569	G06F3/041	USPAT	OR	OFF	2016/09/06 14:13
L18	1051	G06F3/0412	USPAT	OR	OFF	2016/09/06 14:13
L19	7570	17 18	USPAT	OR	OFF	2016/09/06 14:13
L20	1	19 and (display and device and light and shielding and flexible and first and second and signal and edge).clm.	USPAT	OR	OFF	2016/09/06 14:14
L21	1	19 and (display and device and light and shielding and flexible and first and second and signal and peripheral).clm.	USPAT	OR	OFF	2016/09/06 14:14
L22	1	19 and (display and device and light and shielding and flexible and first and second	USPAT	OR	OFF	2016/09/06 14:14

		and signal and edge).clm.				
S47	30907	(345/156,204,173).CCLS.	US-PGPUB; USPAT	OR	OFF	2013/11/19 16:36
S48	1	S47 and (display and device and coordinate and input and first and second and (interconnect wire\$1) and inspection and electrode\$1 and terminal\$1).clm.	US-PGPUB; USPAT	OR	OFF	2013/11/19 16:37
S49	1	S47 and (display and device and first and second and (interconnect wire\$1) and inspection and electrode\$1 and terminal\$1).clm.	US-PGPUB; USPAT	OR	OFF	2013/11/19 16:37
S50	1	S47 and (first and second and (interconnect wire\$1) and inspection and electrode\$1 and terminal\$1).clm.	US-PGPUB; USPAT	OR	OFF	2013/11/19 16:37
S51	1	S47 and (flexible and (interconnect wire\$1) and inspection and electrode\$1 and terminal\$1).clm.	US-PGPUB; USPAT	OR	OFF	2013/11/19 16:38
S70	5253	G06F3/041	USPAT	OR	OFF	2015/10/17 18:56
S71	0	S70 and (display and device and light and shielding and flexible and first and second and interconnect and peripheral and edge).clm.	USPAT	OR	OFF	2015/10/17 19:03
S72	0	S70 and (display and device and light and shielding and flexible and first and second and signal and peripheral and edge).clm.	USPAT	OR	OFF	2015/10/17 19:09
S73	0	S70 and (display and device and light and shielding and flexible and first and second and signal and peripheral).clm.	USPAT	OR	OFF	2015/10/17 19:09
S74	0	S70 and (display and device and light and shielding and flexible and first and second and signal and edge).clm.	USPAT	OR	OFF	2015/10/17 19:09

9/ 6/ 2016 2:15:15 PM

C:\Users\klee1\Documents\EAST\Workspaces\13151362.wsp

<i>Index of Claims</i> 	Application/Control No. 15005737	Applicant(s)/Patent Under Reexamination ANNO ET AL.
	Examiner KENNETH B LEE JR	Art Unit 2697

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

☒ Claims renumbered in the same order as presented by applicant ☐ CPA ☐ T.D. ☐ R.1.47									
CLAIM		DATE							
Final	Original	03/19/2016	09/06/2016						
	1	✓	=						
	2	✓	=						
	3	✓	=						
	4	✓	=						
	5	✓	=						
	6	✓	=						
	7	✓	=						
	8	✓	=						
	9	✓	=						
	10	✓	=						
	11	✓	=						
	12	✓	=						
	13	✓	=						
	14	✓	=						
	15	✓	=						
	16	✓	=						
	17	✓	=						
	18	✓	=						
	19	✓	=						
	20		=						
	21		=						

PART B - FEE(S) TRANSMITTAL

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

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

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

TYPHA IP LLC
 1819 L St. NW Suite 200
 Washington DC 20036

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

Certificate of Mailing or Transmission

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

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

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
-----------------	-------------	----------------------	---------------------	------------------

15/005,737 2016-01-25 Kouichi ANNO 0520-51700CX1CON 7062

TITLE OF INVENTION:

DISPLAY DEVICE

APPLN. TYPE	ENTITY	ISSUE FEE	PUBLICATION FEE	TOTAL FEE(S) DUE	DATE DUE
nonprovisional	Undiscounted	\$960	\$0	\$960	2016-12-09

EXAMINER	ART UNIT	CLASS-SUBCLASS
LEE JR, KENNETH B	2697	345-174000

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

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

2. For printing on the patent front page, list

- (1) the names of up to 3 registered patent attorneys or agents OR, alternatively,
- (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. TYPHA IP LLC

2. _____

3. _____

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

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

(A) NAME OF ASSIGNEE

Japan Display Inc.

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

Tokyo, Japan

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. The following fee(s) are enclosed:

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

4b. Payment of Fee(s):

- ☐ A check in the amount of the fee(s) is enclosed.
- ☒ Payment by credit card. Form PTO-2038 is attached.
- ☒ The Director is hereby authorized by charge the required fee(s), or credit any overpayment, to Deposit Account Number 508785

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

- ☐ a. Applicant claims SMALL ENTITY status. See 37 CFR 1.27. ☐ b. Applicant is no longer claiming SMALL ENTITY status. See 37 CFR 1.27(g)(2).

The Director of the USPTO is requested to apply the Issue Fee and Publication Fee (if any) or to re-apply any previously paid issue fee to the application identified above. NOTE: The Issue Fee and Publication Fee (if required) will not be accepted from anyone other than the applicant; a registered attorney or agent; or the assignee or other party in interest as shown by the records of the United States Patent and Trademark Office.

Authorized Signature /Arimi Yamada/

Date 2016-10-28

Typed or printed name Arimi Yamada

Registration No. 70156

This collection of information is required by 37 CFR 1.311. The information is required to obtain or retain a benefit by the public which is to file (and by the USPTO to process) an application. Confidentiality is governed by 35 U.S.C. 122 and 37 CFR 1.14. This collection is estimated to take 12 minutes to complete, including gathering, preparing, and submitting the completed application form to the USPTO. Time will vary depending upon the individual case. Any comments on the amount of time you require to complete this form and/or suggestions for reducing this burden, should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, U.S. Department of Commerce, P.O. Box 1450, Alexandria, Virginia 22313-1450. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. SEND TO: Commissioner for Patents, P.O. Box 1450, Alexandria, Virginia 22313-1450.

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

Privacy Act Statement

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

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

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

Electronic Patent Application Fee Transmittal				
Application Number:		15005737		
Filing Date:		25-Jan-2016		
Title of Invention:		DISPLAY DEVICE		
First Named Inventor/Applicant Name:		Kouichi ANNO		
Filer:		Arima Yamada/Emily Rice		
Attorney Docket Number:		0520-51700CX1CON		
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	960	960

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

Electronic Acknowledgement Receipt

EFS ID:	27350501
Application Number:	15005737
International Application Number:	
Confirmation Number:	7062
Title of Invention:	DISPLAY DEVICE
First Named Inventor/Applicant Name:	Kouichi ANNO
Customer Number:	133303
Filer:	Arimi Yamada
Filer Authorized By:	
Attorney Docket Number:	0520-51700CX1CON
Receipt Date:	28-OCT-2016
Filing Date:	25-JAN-2016
Time Stamp:	10:28:45
Application Type:	Utility under 35 USC 111(a)

Payment information:

Submitted with Payment	yes
Payment Type	CARD
Payment was successfully received in RAM	\$ 960
RAM confirmation Number	102816INTEFSW10295500
Deposit Account	506785
Authorized User	Arimi Yamada
The Director of the USPTO is hereby authorized to charge indicated fees and credit any overpayment as follows: 37 CFR 1.16 (National application filing, search, and examination fees) 37 CFR 1.17 (Patent application and reexamination processing fees)	

37 CFR 1.19 (Document supply fees)
 37 CFR 1.20 (Post Issuance fees)
 37 CFR 1.21 (Miscellaneous fees and charges)

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)	0520-51700CX1CON_Issue_Fee_Ptol85b_cu.pdf	259246	no	2
			837dbc18575737c8bfb52cfa0c289981348cc594		

Warnings:

Information:

2	Fee Worksheet (SB06)	fee-info.pdf	30235	no	2
			3696be675eaab8fd08ad1b9685a9ee7c1689f4e36		

Warnings:

Information:

Total Files Size (in bytes):	289481
-------------------------------------	--------

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.



UNITED STATES PATENT AND TRADEMARK OFFICE

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

APPLICATION NO.	ISSUE DATE	PATENT NO.	ATTORNEY DOCKET NO.	CONFIRMATION NO.
15/005,737	11/29/2016	9507477	0520-51700CX1CON	7062

133303 7590 11/09/2016
TYPHA IP LLC
1819 L Street NW Suite 200
Washington, DC 20036

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):

Japan Display Inc., Tokyo, JAPAN;
Kouchi ANNO, Mobara, JAPAN;
Panasonic Liquid Crystal Display Co. Ltd., Hyogo-ken, JAPAN;
Takumi SATO, Mobara, JAPAN;
Masahiro TERAMOTO, Mobara, JAPAN;

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



ELECTRONIC ACKNOWLEDGEMENT RECEIPT

APPLICATION # 15/005,737	RECEIPT DATE / TIME 05/08/2025 11:48:23 PM Z ET	ATTORNEY DOCKET # 0520-51700CX1CON
------------------------------------	---	--

Title of Invention

DISPLAY DEVICE

Application Information

APPLICATION TYPE	Utility - Nonprovisional Application under 35 USC 111(a)	PATENT #	9507477
CONFIRMATION #	7062	FILED BY	Yi Lu
PATENT CENTER #	70355237	FILING DATE	01/25/2016
CUSTOMER #	133303	FIRST NAMED INVENTOR	Kouichi ANNO
CORRESPONDENCE ADDRESS	-	AUTHORIZED BY	Szymon Gurda

Documents

TOTAL DOCUMENTS: 2

DOCUMENT	PAGES	DESCRIPTION	SIZE (KB)
POA.pdf	2	Power of Attorney	933 KB
aia0096.pdf	3	Assignee showing of ownership per 37 CFR 3.73	121 KB

Digest

DOCUMENT	MESSAGE DIGEST(SHA-512)
POA.pdf	F8DFB8990230131BFED530F932A56A14EE9C01768F3A9136C C2919CFB75E2EAD254B87FBCEA4DF920964566369455DA3F FA6DBD9298F5D49286B8A507D99EF6A
aia0096.pdf	B4C883FF89682339F59ECF4E90DD9AF8B0F40DF717B71709E 79F6E4F54407BF0BF8D133E5AE432034682A54D08D6FDF5AE

C8D5FA95D32459401CACD72C33F098

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 filing date (see 37 CFR 1.53(b)-(d) and MPEP 506), a Filing Receipt (37 CFR 1.54) will be issued in due course and the date shown on this Acknowledgement Receipt will establish the filing date of the application

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

If a timely submission to enter the national stage of an international application is compliant with the conditions of 35 U.S.C. 371 and other applicable requirements a Form PCT/DO/EO/903 indicating acceptance of the application as a national stage submission under 35 U.S.C. 371 will be issued in addition to the Filing Receipt, in due course.

New International Application Filed with the USPTO as a Receiving Office

If a new international application is being filed and the international application includes the necessary components for an international filing date (see PCT Article 11 and MPEP 1810), a Notification of the International Application Number and of the International Filing Date (Form PCT/RO/105) will be issued in due course, subject to prescriptions concerning national security, and the date shown on this Acknowledgement Receipt will establish the international filing date of the application.

PATENT - POWER OF ATTORNEY OR REVOCATION OF POWER OF ATTORNEY WITH A NEW POWER OF ATTORNEY AND CHANGE OF CORRESPONDENCE ADDRESS	Patent Number	9507477
	Issue Date	November 29, 2016
	First Named Inventor	Kouichi ANNO
	Title	DISPLAY DEVICE
	Attorney Docket No.	0853-04089 US

I hereby revoke all previous powers of attorney given in the above-identified patent.

☐ A Power of Attorney is submitted herewith.

OR

☒ I hereby appoint Practitioner(s) associated with the Customer Number identified in the box at right as my/our attorney(s) or agent(s) with respect to the patent identified above, and to transact all business in the United States Patent and Trademark Office connected therewith:

27197

OR

☐ I hereby appoint Practitioner(s) named below as my/our attorney(s) or agent(s) with respect to the patent identified above, and to transact all business in the United States Patent and Trademark Office connected therewith:

Practitioner(s) Name	Registration Number

Please recognize or change the correspondence address for the above-identified patent to:

☒ The address associated with the above-identified Customer Number.

OR

☐ The address associated with the Customer Number identified in the box at right:

OR

☐ Firm or
Individual Name

Address

City

State

Zip

Country

Telephone

Email

I am the:

☐ Applicant.

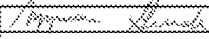
OR

☒ Patent owner.

☒ Statement under 37 CFR 3.73(c) (Form PTO/AIA/96) submitted herewith or filed on _____.

SIGNATURE of Applicant or Patent Owner

The undersigned (whose title is supplied below) is authorized to act on behalf of the applicant or patent owner if the applicant or patent owner is a juristic entity (e.g., corporation, university).

Signature		Date	May 8, 2025
Name	Szymon Gurda	Telephone	
Title and Company	Authorized Signatory, Paneltouch Technologies LLC		

NOTE: Signatures of all the applicants or patent owners of the entire interest or their representative(s) are required. If more than one signature is required, submit multiple forms, check the box below, and identify the total number of forms submitted in the blank below.

☐ A total of _____ forms are submitted.

A Federal agency may not conduct or sponsor, and a person is not required to respond to, nor shall a person be subject to a penalty for failure to comply with an information collection subject to the requirements of the Paperwork Reduction Act of 1995, unless the information collection has a currently valid OMB Control Number. The OMB Control Number for this information collection is 0651-0035. Public burden for this form is estimated to average 30 minutes per response, including the time for reviewing instructions, searching existing data sources, gathering and maintaining the data needed, and completing and reviewing the information collection. Send comments regarding this burden estimate or any other aspect of this information collection, including suggestions for reducing this burden to the Chief Administrative Officer, United States Patent and Trademark Office, P.O. Box 1450, Alexandria, VA 22313-1450 or email InformationCollection@uspto.gov. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. If filing this completed form by mail, send to: **Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450.**

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

Privacy Act Statement

The Privacy Act of 1974 (P.L. 93-579) requires that you be given certain information in connection with your submission of the attached form related to a patent application or patent. The United States Patent and Trademark Office (USPTO) collects the information in this record under authority of 35 U.S.C. 2. The USPTO's system of records is used to manage all applicant and owner information including name, citizenship, residence, post office address, and other information with respect to inventors and their legal representatives pertaining to the applicant's/owner's activities in connection with the invention for which a patent is sought or has been granted. The applicable Privacy Act System of Records Notice for the information collected in this form is COMMERCE/PAT-TM-7 Patent Application Files, available in the Federal Register at 78 FR 19243 (March 29, 2013). <https://www.govinfo.gov/content/pkg/FR-2013-03-29/pdf/2013-07341.pdf>

Routine uses of the information in this record may include disclosure to: 1) law enforcement, in the event that the system of records indicates a violation or potential violation of law; 2) a Federal, state, local, or international agency, in response to its request; 3) a contractor of the USPTO having need for the information in order to perform a contract; 4) the Department of Justice for determination of whether the Freedom of Information Act (FOIA) requires disclosure of the record; 5) a Member of Congress submitting a request involving an individual to whom the record pertains, when the individual has requested the Member's assistance with respect to the subject matter of the record; 6) a court, magistrate, or administrative tribunal, in the course of presenting evidence, including disclosures to opposing counsel in the course of settlement negotiations; 7) the Administrator, General Services Administration (GSA), or their designee, during an inspection of records conducted by GSA under authority of 44 U.S.C. 2904 and 2906, in accordance with the GSA regulations and any other relevant (i.e., GSA or Commerce) directive, where such disclosure shall not be used to make determinations about individuals; 8) 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)); 9) the Office of Personnel Management (OPM) for personnel research purposes; and 9) the Office of Management and Budget (OMB) for legislative coordination and clearance.

If you do not furnish the information requested on this form, the USPTO may not be able to process and/or examine your submission, which may result in termination of proceedings, abandonment of the application, and/or expiration of the patent.

STATEMENT UNDER 37 CFR 3.73(c)

Applicant/Patent Owner: PANELTOUCH TECHNOLOGIES LLC
Application No./Patent No.: 9507477 Filed/Issue Date: November 29, 2016
Titled: DISPLAY DEVICE
PANELTOUCH TECHNOLOGIES LLC, 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: the inventors To: HITACHI DISPLAYS, LTD. and PANASONIC LIQUID CRYSTAL DISPLAY CO., LTD.

The document was recorded in the United States Patent and Trademark Office at
Reel 026626, Frame 0830, or for which a copy thereof is attached.

2. From: HITACHI DISPLAYS, LTD. To: JAPAN DISPLAY EAST, INC.

The document was recorded in the United States Patent and Trademark Office at
Reel 031980, Frame 0316, or for which a copy thereof is attached.

[Page 1 of 2]

This collection of information is required by 37CFR 3.73(b). 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 35U.S.C. 122 and 37 CFR 1.11 and 1.14. This collection is estimated to take 12 minutes to complete, including gathering, preparing, and submitting the completed application form to the USPTO. Time will vary depending upon the individual case. Any comments on the amount of time you require to complete this form and/or suggestions for reducing this burden, should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, U.S. Department of Commerce, P.O. Box 1450, Alexandria, VA 22313-1450. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. **SEND TO: Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450**

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

STATEMENT UNDER 37 CFR 3.73(c)

3. From: JAPAN DISPLAY EAST, INC. To: JAPAN DISPLAY INC.

The document was recorded in the United States Patent and Trademark Office at
Reel 031997, Frame 0245, or for which a copy thereof is attached.

4. From: PANASONIC LIQUID CRYSTAL DISPLAY CO., LTD. To: PANASONIC INTELLECTUAL PROPERTY CORPORATION OF AMERICA

The document was recorded in the United States Patent and Trademark Office at
Reel 065615, Frame 0327, or for which a copy thereof is attached.

5. From: PANASONIC INTELLECTUAL PROPERTY CORPORATION OF AMERICA and JAPAN DISPLAY INC. To: PANELTOUCH TECHNOLOGIES LLC

The document was recorded in the United States Patent and Trademark Office at
Reel 067245, Frame 0560, 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.

/Szymon Gurda/

May 8, 2025

Signature

Date

Szymon Gurda

58451

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.



UNITED STATES PATENT AND TRADEMARK OFFICE

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

APPLICATION NUMBER	FILING OR 371(C) DATE	FIRST NAMED APPLICANT	ATTY. DOCKET NO./TITLE
15/005,737	01/25/2016	Kouichi ANNO	0853-04089 US

CONFIRMATION NO. 7062

POA ACCEPTANCE LETTER



OC000000088988020

27197

MICHAEL J. CHERSKOV
SZYMON M. GURDA
903 COMMERCE DR
SUITE 310
OAK BROOK, IL 60523

Date Mailed: 05/21/2025

NOTICE OF ACCEPTANCE OF POWER OF ATTORNEY

This is in response to the Power of Attorney filed 05/08/2025.

The Power of Attorney in this application is accepted. Correspondence in this application will be mailed to the above address as provided by 37 CFR 1.33.

Questions about the contents of this notice and the requirements it sets forth should be directed to the Office of Data Management, Application Assistance Unit, at (571) 272-4000 or (571) 272-4200 or 1-888-786-0101.

/qnguyen/



UNITED STATES PATENT AND TRADEMARK OFFICE

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

APPLICATION NUMBER	FILING OR 371(C) DATE	FIRST NAMED APPLICANT	ATTY. DOCKET NO./TITLE
15/005,737	01/25/2016	Kouichi ANNO	0520-51700CX1CON

133303
MICHAEL BEST & FRIEDRICH LLP
790 N WATER ST
SUITE 2500
MILWAUKEE, WI 53202

CONFIRMATION NO. 7062

POWER OF ATTORNEY NOTICE



OC000000088987961

Date Mailed: 05/21/2025

NOTICE REGARDING CHANGE OF POWER OF ATTORNEY

This is in response to the Power of Attorney filed 05/08/2025.

- The Power of Attorney to you in this application has been revoked by the assignee who has intervened as provided by 37 CFR 3.71. Future correspondence will be mailed to the new address of record(37 CFR 1.33).

Questions about the contents of this notice and the requirements it sets forth should be directed to the Office of Data Management, Application Assistance Unit, at (571) 272-4000 or (571) 272-4200 or 1-888-786-0101.

/qnguyen/