ABSTRACT OF THE DISCLOSURE

Disclosed is a conductor pattern structure of a capacitive touch panel. First-axis conductor assemblies and second-axis conductor assemblies are formed on a surface of a substrate. Each first-axis conductor assembly includes a plurality of first-axis conductor cells that are interconnected by first-axis conduction lines. An insulation layer is formed on a surface of each first-axis conduction line. Each second-axis conductor assembly includes a plurality of second-axis conductor cells that are interconnected by second-axis conduction lines. Each second-axis conduction line extends across the insulation layer of the associated first-axis conduction line.

Application Data Sheet 37 CFR 1.76	Attorney Docket Number	TVM-002
	Application Number	

Title of Invention	CONDUCTOR PATTERN STRUCTURE OF CAPACITIVE TOUCH PANEL

The application data sheet is part of the provisional or nonprovisional application for which it is being submitted. The following form contains the bibliographic data arranged in a format specified by the United States Patent and Trademark Office as outlined in 37 CFR 1.76.
This document may be completed electronically and submitted to the Office in electronic format using the Electronic Filing System (EFS) or the document may be printed and included in a paper filed application.

Secrecy Order 37 CFR 5.2

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

Applicant Information:

Applicant 1 Remove

Applicant Authority ◉ Inventor ◯ Legal Representative under 35 U.S.C. 117 ◯ Party of Interest under 35 U.S.C. 118

Prefix	**Given Name**	**Middle Name**	**Family Name**	**Suffix**
	Ching-Yang		Chang	

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

City	Taipei	**Country Of Residence** i	TW
Citizenship under 37 CFR 1.41(b) i			

Mailing Address of Applicant:

Address 1	2F-1, No. 5, Alley 22, Lane 513		
Address 2	Rueiguang Rd., Neihu		
City	Taipei	**State/Province**	
Postal Code	114	**Country** i	TW

Applicant 2 Remove

Applicant Authority ◉ Inventor ◯ Legal Representative under 35 U.S.C. 117 ◯ Party of Interest under 35 U.S.C. 118

Prefix	**Given Name**	**Middle Name**	**Family Name**	**Suffix**
	Shun-Ta		Chien	

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

City	Taipei	**Country Of Residence** i	TW
Citizenship under 37 CFR 1.41(b) i			

Mailing Address of Applicant:

Address 1	2F-1, No. 5, Alley 22, Lane 513		
Address 2	Rueiguang Rd., Neihu		
City	Taipei	**State/Province**	
Postal Code	114	**Country** i	TW

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.**

Application Data Sheet 37 CFR 1.76	Attorney Docket Number	TVM-002
	Application Number	
Title of Invention	CONDUCTOR PATTERN STRUCTURE OF CAPACITIVE TOUCH PANEL	

Customer Number	03897		
Email Address		Add Email	Remove Email

Application Information:

Title of the Invention	CONDUCTOR PATTERN STRUCTURE OF CAPACITIVE TOUCH PANEL		
Attorney Docket Number	TVM-002	**Small Entity Status Claimed**	☒
Application Type	Nonprovisional		
Subject Matter	Utility		
Suggested Class (if any)		**Sub Class (if any)**	
Suggested Technology Center (if any)			
Total Number of Drawing Sheets (if any)	5	**Suggested Figure for Publication (if any)**	

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).
Enter either 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	03897		

Domestic Benefit/National Stage Information:

This section allows for the applicant to either claim benefit under 35 U.S.C. 119(e), 120, 121, or 365(c) or indicate National Stage entry from a PCT application. Providing this information in the application data sheet constitutes the specific reference required by 35 U.S.C. 119(e) or 120, and 37 CFR 1.78(a)(2) or CFR 1.78(a)(4), and need not otherwise be made part of the specification.

Prior Application Status		Remove	
Application Number	Continuity Type	Prior Application Number	Filing Date (YYYY-MM-DD)

Additional Domestic Benefit/National Stage Data may be generated within this form by selecting the **Add** button. Add

Foreign Priority Information:

Application Data Sheet 37 CFR 1.76	Attorney Docket Number	TVM-002
	Application Number	

Title of Invention	CONDUCTOR PATTERN STRUCTURE OF CAPACITIVE TOUCH PANEL

This section allows for the applicant to claim benefit of foreign priority and to identify any prior foreign application for which priority is not claimed. 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(a).

Remove

Application Number	Country i	Parent Filing Date (YYYY-MM-DD)	Priority Claimed
96115152	TW	2007-04-27	◉ Yes ○ No

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

Add

Assignee Information:

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

Assignee 1

Remove

If the Assignee is an Organization check here. ☒

Organization Name	TrendOn Touch Technology Corp.		
Mailing Address Information:			
Address 1	2F-1, No. 5, Alley 22, Lane 513		
Address 2	Rueiguang Rd., Neihu		
City	Taipei	**State/Province**	
Country i	TW	Postal Code	114
Phone Number		Fax Number	
Email Address			

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

Add

Signature:

A signature of the applicant or representative is required in accordance with 37 CFR 1.33 and 10.18. Please see 37 CFR 1.4(d) for the form of the signature.

Signature	/thomas schneck/			Date (YYYY-MM-DD)	2007-08-21
First Name	Thomas	Last Name	Schneck	Registration Number	24518

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.

What is claimed is:

1. A conductor pattern structure of a capacitive touch panel, which is adapted to form on a surface of a substrate, the touch-control pattern structure comprising:

   a plurality of first-axis conductor assemblies, each first-axis conductor assembly comprising a plurality of first-axis conductor cells arranged on the substrate surface along a first axis in a substantially equally-spaced manner, a disposition zone being delimited between adjacent ones of the first-axis conductor assemblies and between adjacent ones of the first-axis conductor cells;

   a plurality of first-axis conduction lines respectively connecting between adjacent ones of the first-axis conductor cells of each first-axis conductor assembly so that the first-axis conductor cells of each respective first-axis conductor assembly are electrically connected together;

   a plurality of insulation layers each covering a surface of each first-axis conduction line;

   a plurality of second-axis conductor assemblies, each second-axis conductor assembly comprising a plurality of second-axis conductor cells arranged on the substrate surface along a second axis in a substantially equally-spaced manner, each second-axis conductor cell being set in each disposition zone; and

   a plurality of second-axis conduction lines respectively connecting between adjacent ones of the second-axis conductor cells of each second-axis conductor assembly so that the second-axis conductor cells of each respective second-axis conductor assembly are electrically connected together, the second-axis conduction line being extended across a surface of the insulation layer of the respective first-axis conduction line.

2. The conductor pattern structure as claimed in Claim 1, wherein the first-axis conductor cells and the second-axis conductor cells consist of a transparent conductive material.

3. The conductor pattern structure as claimed in Claim 1, wherein the first-axis conduction lines and the second-axis conduction lines consist of a transparent conductive material.

4. The conductor pattern structure as claimed in Claim 1, wherein the insulation layer consists of a transparent insulation material.

5. The conductor pattern structure as claimed in Claim 1, wherein the first-axis conductor cells and the second-axis conductor cells have a contour of hexagonal shape.

6. A conductor pattern structure of a capacitive touch panel adapted to form on a surface of a substrate, the touch-control pattern structure comprising:

   at least two adjacent first-axis conductor cells; and

   at least two adjacent second-axis conductor cells,

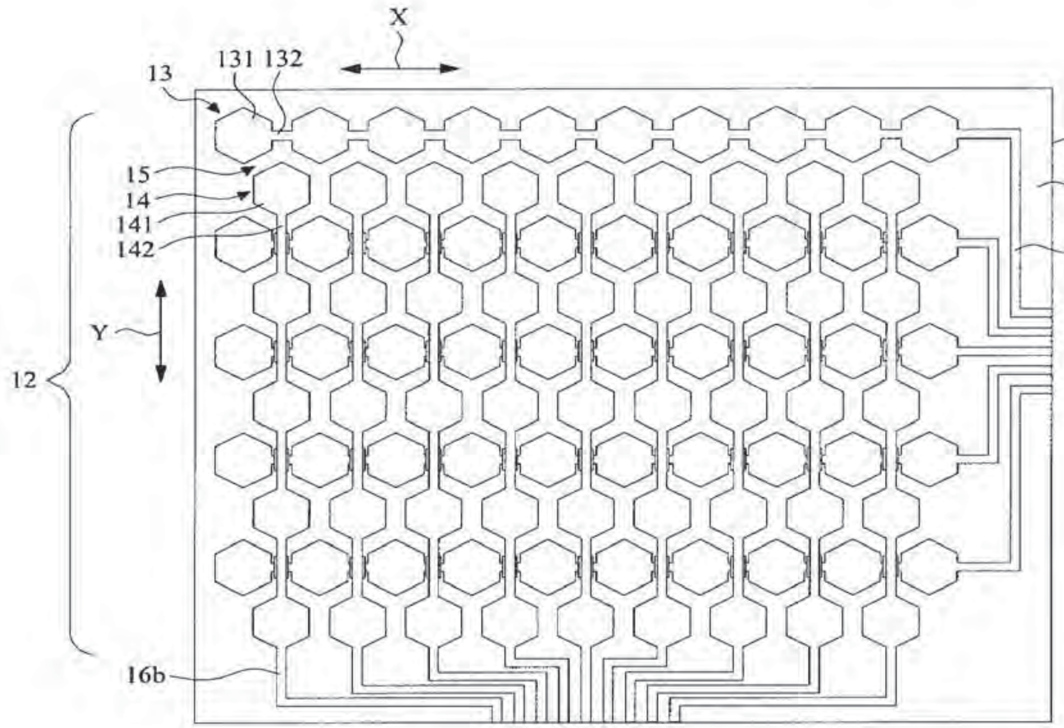
   wherein the adjacent first-axis conductor cells are connected by a first-axis conduction line provided therebetween, characterized in that an insulation layer is formed on a surface of the first-axis conduction line and a second-axis conduction line extends across a surface of the insulation layer to connect between the adjacent second-axis conductor cells.

7. The conductor pattern structure as claimed in Claim 6, wherein the first-axis conductor cells and the second-axis conductor cells consist of a transparent conductive material.

8. The conductor pattern structure as claimed in Claim 6, wherein the first-axis conduction line and the second-axis conduction line consist of a transparent conductive material.

9. The conductor pattern structure as claimed in Claim 6, wherein the insulation layer consists of a transparent insulation material.

10. The conductor pattern structure as claimed in Claim 6, wherein the first-axis conductor cells and the second-axis conductor cells have a contour of hexagonal shape.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131
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141
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16a
Y
12
16b

FIG.1

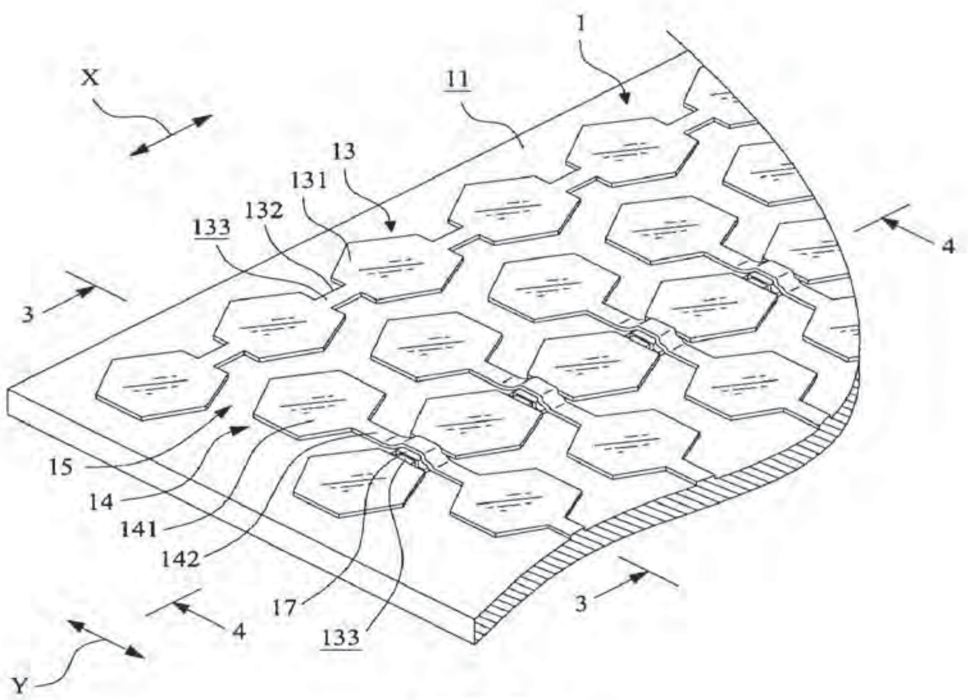
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FIG.2

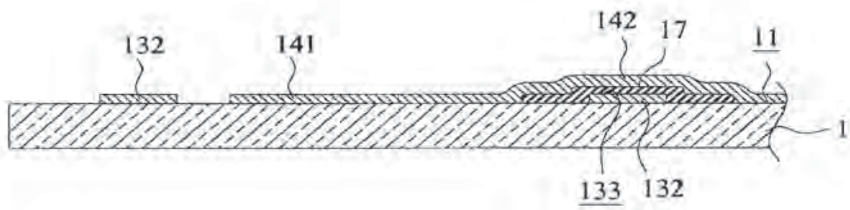

FIG.3

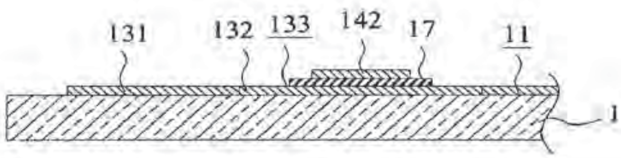

FIG.4

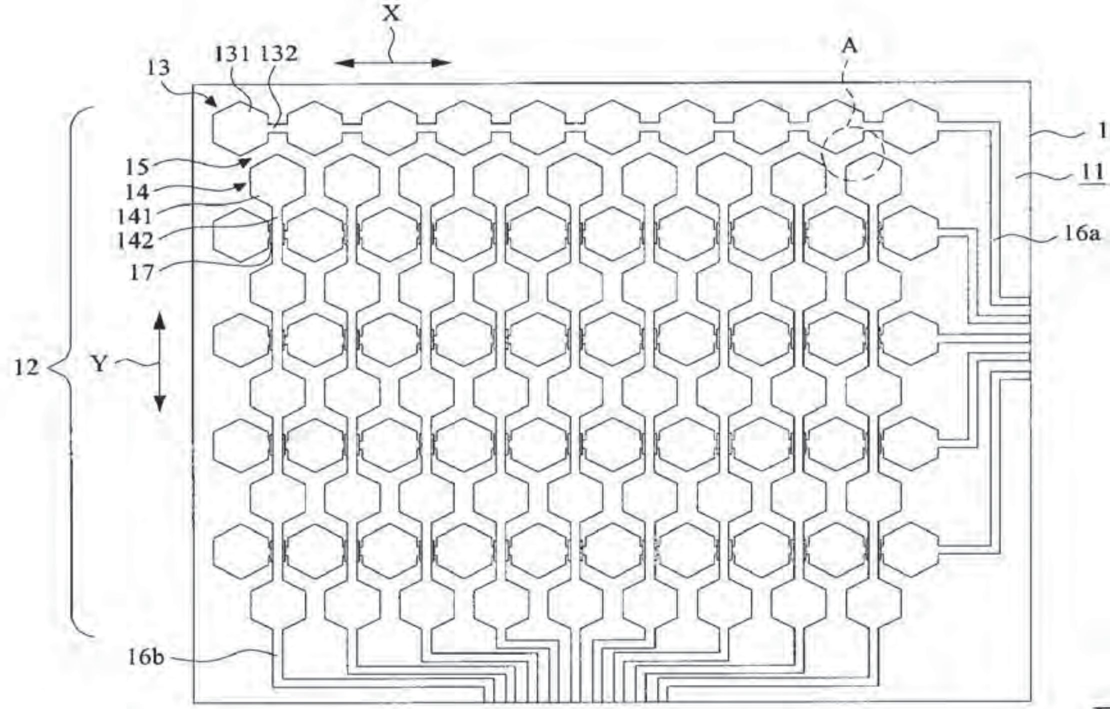
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FIG.5

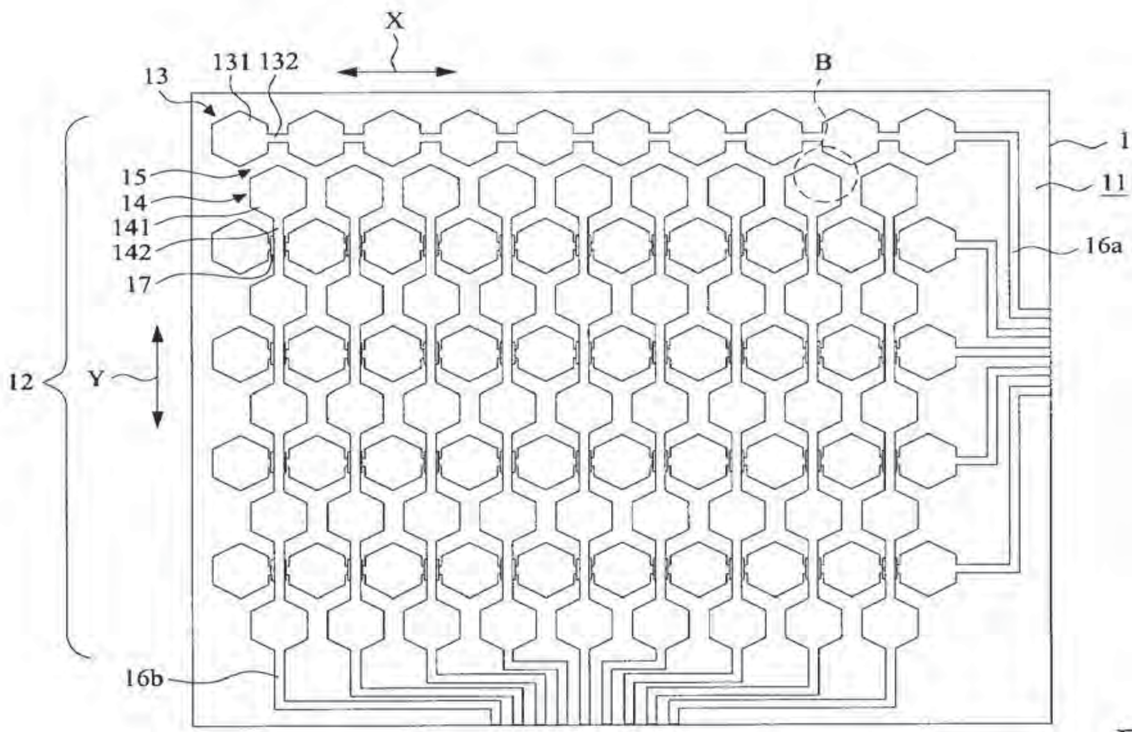
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FIG.6

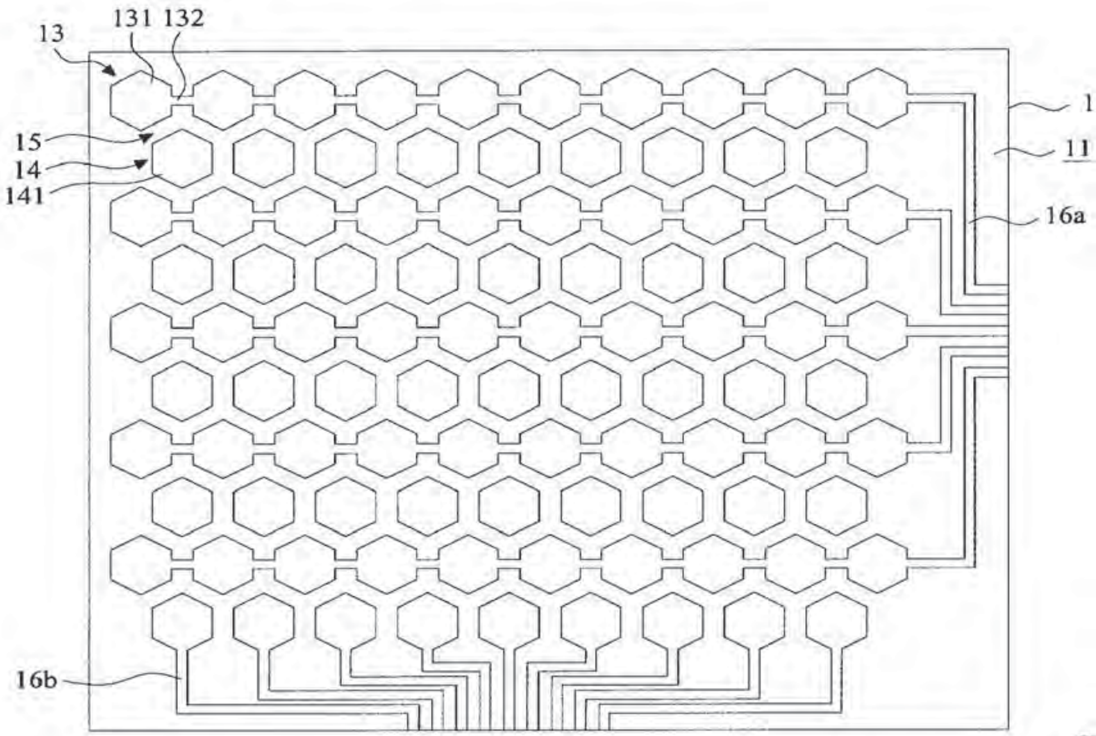
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FIG.7

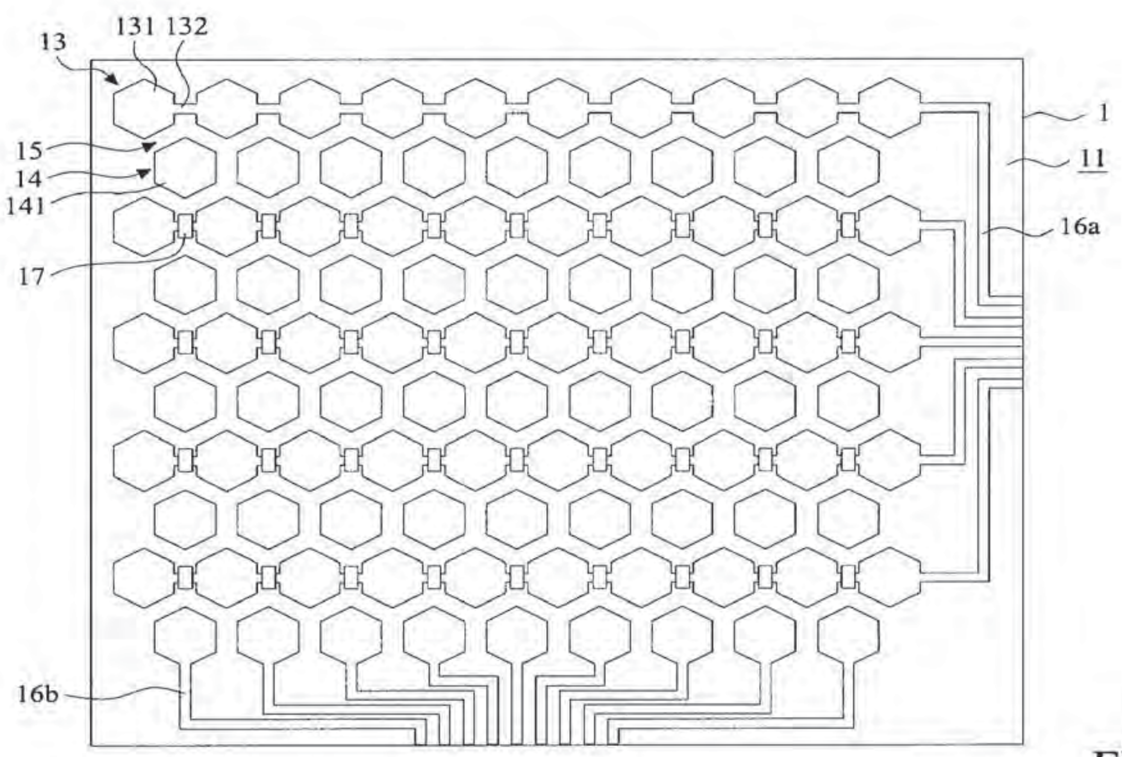
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FIG.8

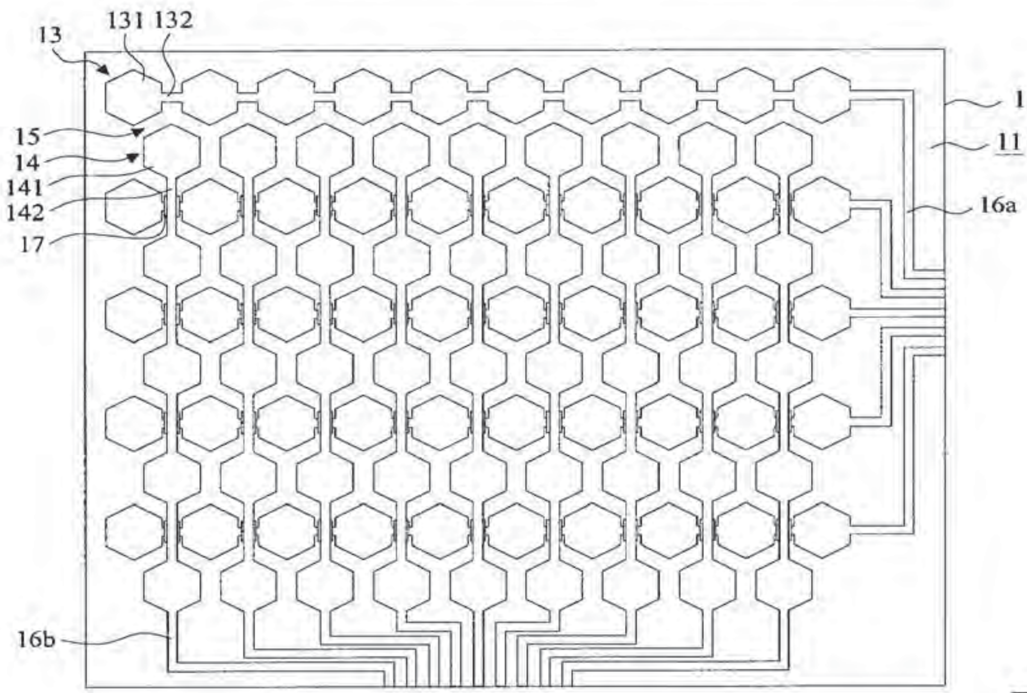

FIG.9

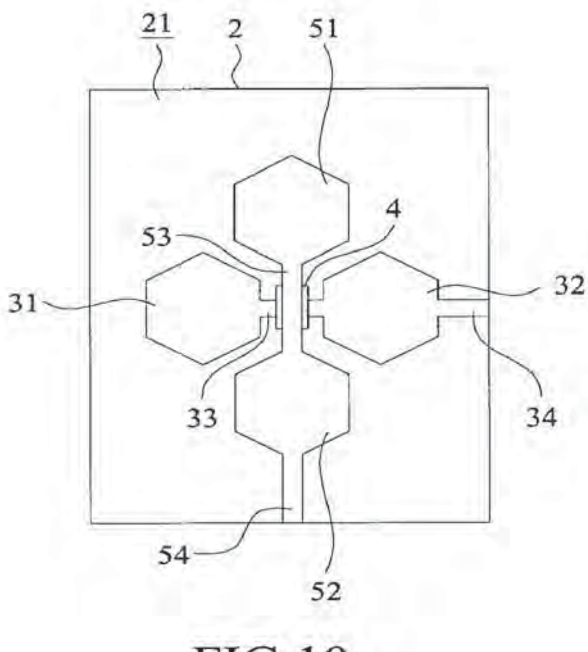

FIG.10

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DECLARATION FOR UTILITY OR DESIGN PATENT APPLICATION (37 CFR 1.63)

☒ Declaration Submitted with Initial Filing OR ☐ Declaration Submitted after Initial Filing (surcharge (37 CFR 1.16 (e)) required)

Attorney Docket Number	TVM-002
First Named Inventor	Ching-Yang Chang
COMPLETE IF KNOWN	
Application Number	/
Filing Date	
Group Art Unit	
Examiner Name	

As a below named inventor, I hereby declare that:

My residence, post office address, and citizenship are as stated below next to my name.

I believe I am the original, first and sole inventor (if only one name is listed below) or an original, first and joint inventor (if plural names are listed below) of the subject matter which is claimed and for which a patent is sought on the invention entitled:

Conductor Pattern Structure of Capacitive Touch Panel

(Title of the Invention)

the specification of which

☒ is attached hereto

OR

☐ was filed on (MM/DD/YYYY) [ ] as United States Application Number or PCT International Application Number [ ] and was amended on (MM/DD/YYYY) [ ] (if applicable).

I hereby state that I have reviewed and understand the contents of the above identified specification, including the claims, as amended by any amendment specifically referred to above.

I acknowledge the duty to disclose information which is material to patentability as defined in 37 CFR 1.56.

I hereby claim foreign priority benefits under 35 U.S.C. 119(a)-(d) or 365(b) of any foreign application(s) for patent or inventor's certificate, or 365(a) of any PCT international application which designated at least one country other than the United States of America, listed below and have also identified below, by checking the box, any foreign application for patent or inventor's certificate, or of any PCT international application having a filing date before that of the application on which priority is claimed.

Prior Foreign Application Number(s)	Country	Foreign Filing Date (MM/DD/YYYY)	Priority Not Claimed	Certified Copy Attached? YES	NO
96115152	Taiwan, R.O.C.	April 27, 2007	☐	☒	☐
			☐	☐	☐
			☐	☐	☐
			☐	☐	☐

☐ Additional foreign application numbers are listed on a supplemental priority data sheet PTO/SB/02B attached hereto:

I hereby claim the benefit under 35 U.S.C. 119(e) of any United States provisional application(s) listed below.

Application Number(s)	Filing Date (MM/DD/YYYY)

☐ Additional provisional application numbers are listed on a supplemental priority data sheet PTO/SB/02B attached hereto.

[Page 1 of 2]

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DECLARATION — Utility or Design Patent Application

I hereby claim the benefit under 35 U.S.C. 120 of any United States application(s), or 365(c) of any PCT international application designating the United States of America, listed below and, insofar as the subject matter of each of the claims of this application is not disclosed in the prior United States or PCT International application in the manner provided by the first paragraph of 35 U.S.C. 112, I acknowledge the duty to disclose information which is material to patentability as defined in 37 CFR 1.56 which became available between the filing date of the prior application and the national or PCT international filing date of this application.

U.S. Parent Application or PCT Parent Number	Parent Filing Date (MM/DD/YYYY)	Parent Patent Number *(if applicable)*

☐ Additional U.S. or PCT international application numbers are listed on a supplemental priority data sheet PTO/SB/02B attached hereto.

As a named inventor, I hereby appoint the following registered practitioner(s) to prosecute this application and to transact all business in the Patent and Trademark Office connected therewith: ☒ Customer Number 003897 → *Place Customer Number Bar Code Label here*
OR
☒ Registered practitioner(s) name/registration number listed below

Name	Registration Number	Name	Registration Number
Thomas Schneck	24,518	David M. Schneck	43,094
Mark Protsik	31,788	Nissa M. Strottman	52,257
Gina McCarthy	42,986	Bradley W. Scheer	47,059
		Patrick T. King	28,231

☐ Additional registered practitioner(s) named on supplemental Registered Practitioner Information sheet PTO/SB/02C attached hereto.

Direct all correspondence to: ☒ Customer Number or Bar Code Label 003897 *OR* ☒ Correspondence address below

Name	Law Offices of Schneck & Schneck				
Address	P.O. Box 2-E				
Address					
City	San Jose	State	CA	ZIP	95109-0005
Country	USA	Telephone	408/297-9733	Fax	408/297-9748

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 18 U.S.C. 1001 and that such willful false statements may jeopardize the validity of the application or any patent issued thereon.

Name of Sole or First Inventor: ☐ A petition has been filed for this unsigned inventor

Given Name (first and middle [if any])	Family Name or Surname
Ching-Yang	Chang

Inventor's Signature	CHANG CHING YANG			Date	May 10, 2006
Residence: City	Taipei City	State		Country	Taiwan, R.O.C.	Citizenship
Post Office Address	2F-1, No. 5, Alley 22, Lane 513, Rueiguang Rd., Neihu, Taipei City, Taiwan, R.O.C				
Post Office Address					
City	Taipei City	State	ZIP	Country	Taiwan, R.O.C.

☒ Additional inventors are being named on the 1 supplemental Additional Inventor(s) sheet(s) PTO/SB/02A attached hereto

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Patent and Trademark Office; U.S. DEPARTMENT OF COMMERCE

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DECLARATION

ADDITIONAL INVENTOR(S)
Supplemental Sheet
Page 1 of 1

Name of Additional Joint Inventor, if any:	☐ A petition has been filed for this unsigned inventor						
Given Name (first and middle [if any])				Family Name or Surname			
Shun-Ta				Chien			
Inventor's Signature	Chien Shun-Ta					Date	05-10-2007
Residence: City	Taipei City	State		Country	Taiwan, R.O.C.	Citizenship	
Post Office Address	2F-1, No. 5, Alley 22, Lane 513, Rueiguang Rd., Neihu, Taipei City, Taiwan, R.O.C.						
Post Office Address							
City	Taipei City	State		ZIP		Country	Taiwan, R.O.C.

Name of Additional Joint Inventor, if any:	☐ A petition has been filed for this unsigned inventor						
Given Name (first and middle [if any])				Family Name or Surname			
Inventor's Signature						Date	
Residence: City		State		Country		Citizenship	
Post Office Address							
Post Office Address							
City		State		ZIP		Country	

Name of Additional Joint Inventor, if any:	☐ A petition has been filed for this unsigned inventor						
Given Name (first and middle [if any])				Family Name or Surname			
Inventor's Signature						Date	
Residence: City		State		Country		Citizenship	
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City		State		ZIP		Country	

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CONDUCTOR PATTERN STRUCTURE OF CAPACITIVE TOUCH PANEL

FIELD OF THE INVENTION

[0001] The present invention relates to the field of touch panel devices, and in particular to a conductor pattern structure of a capacitive touch panel.

BACKGROUND OF THE INVENTION

[0002] Touch panels have been of wide applications in the fields of household appliances, communications, and electronic information appliances. An example of the common applications of the touch panel is an input interface of a personal digital assistant (PDA), an electrical appliance, or a game machine, etc. The current trend of integration of a touch panel and a display panel allows a user to use his or her finger or a stylus to point a control icon shown on the panel in order to execute a desired function on a PDA, an electrical appliance or a game machine, etc. The touch panel is also applied in a public information inquiry system to provide an efficient operation system for the public.

[0003] A conventional touch panel comprises a substrate having a surface on which sensing zones are distributed for sensing a signal associated with the touch of a user's finger or stylus to effect input and control. The sensing zones are made of transparent conductive membranes, such as Indium Tin Oxide (ITO), whereby a user may touch the transparent conducive membrane corresponding to a specific location shown on the display to effect operation of the device.

[0004] The most commonly known types of touch panels include resistive panel, capacitive panel, infrared sensing panel, electromagnetic sensing panel, and sonic sensing panel. The capacitive touch panel employs a change in capacitance caused between a transparent electrode and the electrostatics of human body to induce an current based on which the touch location can be identified. The capacitive touch panel is advantageous in light transparency, hardness, precision, response time, touch cycles, operation temperature, and initiation force and is thus most commonly used currently.

[0005] In order to detect the location where a finger or a stylus touches the touch panel, a variety of capacitive touch panel techniques are developed. An example is US Patent No. 6,970,160, which discloses a lattice touch-sensing system for detecting a position of a touch on a touch-sensitive surface. The lattice touch-sensing system may include two capacitive sensing layers, separated by an insulating material, where each layer consists of substantially parallel conducting elements, and the conducting elements of the two sensing layers are substantially orthogonal to each other. Each element may comprise a series of diamond shaped patches that are connected together with narrow conductive rectangular strips. Each conducting element of a given sensing layer is electrically connected at one or both ends to a lead line of a corresponding set of lead lines. A control circuit may also be included to provide an excitation signal to both sets of conducting elements through the corresponding sets of lead lines, to receive sensing signals generated by sensor elements when a touch on the surface occurs, and to determine a position of the touch based on the position of the affected bars in each layer.

[0006] US Patent No. 4,233,522 discloses a capacitive touch panel comprising an array of touch sensitive switch cells. Each switch cell includes a first and a second pair of series connected capacitors energized by a common signal source, the array of switch cells being arranged so that the first pair of capacitors are connected in first groups of switch cells, such as rows, to a corresponding first plurality of signal detectors, and the second pair of capacitors are connected in second groups of switch cells, such as columns, to a corresponding second plurality of signal detectors, the junctions of each pair of capacitors of a single switch cell being selectively coupled to ground by the body or other touch capacitive means for actuating a selected switch cell.

[0007] US Patent No. 4,733,222 discloses a capacitance variation sensitive touch sensing array system including an array of electrodes, an array of drive lines, a drive signal generator, and an array of sense lines. Each electrode is a connected series of conductive tabs and forms either a row or a column of the electrode array. Each drive line is capacitively coupled to a plurality of the electrodes. The drive signal generator generates and applies alternating signal packets to the drive lines. The sense line is capacitively coupled to a plurality of the electrodes so that signals are derived from the electrodes when drive signals are applied to the drive lines. The number of electrodes is equal to the product of the number of drive lines and the number of sense lines. Based on values derived from signals on the sense lines, a microprocessor provides information associated with touch by an operator.

[0008] US Patent No. 5,880,411 discloses a method for recognizing a position made by a conductive object on a touch-sensor pad. Signals are sent to a control circuit of a host to identify the touch position. US Patent Nos. 6,414,671 and 5,374,787 disclose the same technique.

[0009] US Patent No. 7,030,860 discloses a transparent, capacitive sensing system particularly well suited for input to electronic devices. The capacitive sensor can further be used as an input device for a graphical user interface, especially if overlaid on top of a display device like an LCD screen to sense finger position and contact area over the display.

[0010] US Patent No. 5,459,463 discloses a device for locating an object situated close to a detection area and a transparent keyboard incorporating the device. The device comprises a first set of detection zones connected so as to form lines which extend parallel to each other and to a detection area, a second set of detection zones connected to each other so as to form columns which extend perpendicularly to the lines, a scanning device which applies an electric signal to the lines and columns, and means for determining the position of an object by means of the scanning device.

[0011] US Patent No. 6,498,590 discloses a multi-user touch system including a surface on which antennas are formed. A transmitter transmits uniquely identifiable signals to each antenna. Receivers are capacitively coupled to different users, and the receivers are configured to receive the uniquely identifiable signals. A processor then associates a specific antenna with a particular user when multiple users simultaneously touch any of the antennas.

[0012] US Patent No. 5,847,690 discloses a unitary display and sensing device, which integrates liquid crystal display module elements of a liquid crystal display module for detecting input on a flat panel display screen.

[0013] All the prior art references described above provide teaching of detection touch of a user on a touch panel and all are comprised of structures of touch sensing elements. However, these known devices are all of a construction including two capacitive sensing layers spaced from each other with an insulation material to effect capacitive effect between the layers. This makes the structure of the panel very thick and is thus against the trend of miniaturization. Further, the conventional capacitive touch panel comprises a substrate on both surfaces of which two capacitive sensing layers are formed respectively. In this respect, through holes must be formed on the substrate to serve as vias and circuit layering must be adopted to properly connect conductor elements of the sensing layers. This complicates the manufacturing of the capacitive touch panel.

[0014] Thus, it is desired to have a capacitive touch panel that overcomes the above drawbacks of the conventional capacitive touch panels.

SUMMARY OF THE INVENTION

[0015] Thus, an objective of the present invention is to provide a capacitive touch panel comprising a thin conductor pattern structure, which consists of a plurality of first-axis conductor assemblies and a plurality of second-axis conductor assemblies, each conductor assembly being comprised of a plurality of conductor cells interconnected by conduction lines, wherein the conduction lines extending in different axes are isolated from each other by an insulation layer.

[0016] Another objective of the present invention is to provide a capacitive touch panel comprising a conductor pattern structure consisting of first-axis conductor assemblies and second-axis conductor assemblies, both comprising conductors cells connected by conduction lines, the conductor cells and the conduction lines being formed on the same surface of a substrate by known processes for manufacturing general transparent conductor layer, whereby when a user touches the surface of the touch panel, the first-axis conductor assemblies and the second-axis conductor assemblies that are touched by the user induce capacitive effect between adjacent conductor cells thereof.

[0017] According to the present invention, a solution to overcome the above discussed drawbacks of the conventional capacitive touch panels resides in that a conductor pattern structure is formed on a surface of a substrate, comprising a plurality of first-axis conductor assemblies and a plurality of second-axis conductor assemblies that are extended in directions that are substantially perpendicular to each other and that comprise a plurality of equally-spaced first-axis conductor cells and equally-spaced second-axis conductor cells respectively, and first-axis conduction lines and second-axis conduction lines interconnecting the first-axis conductors along the first axis and the second-axis conductors along the second axis respectively, wherein an insulation layer is provided to cover a surface of each first-axis conduction line to isolate the first-axis conduction line from the associated second-axis conduction line.

[0018] According to the present invention, a plurality of first-axis conductor assemblies and a plurality of second-axis conductor assemblies, which constitute the conductor pattern structure of a capacitive touch panel, are formed on the same surface of a substrate, thereby simplifying the structure and reducing the thickness of the structure. When the conductor cells of the first-axis conductor assemblies and the conductor cells of the second-axis conductor assemblies that are adjacent to each other are touched by a user's finger, a capacitance variation signal is induced, in response to the area of the adjacent conductor cells on which the finger of the user is laid, and then applied to a control circuit to identify the position where the user's finger touches the panel. The first-axis conductor assemblies and the second-axis conductor assemblies of the conductor pattern structure can be formed on only one surface of the substrate by the general circuit laying techniques. Thus, the present invention can be practiced in a simple process with high passing rate and low costs.

BRIEF DESCRIPTION OF THE DRAWINGS

[0019] The present invention will be apparent to those skilled in the art by reading the following description of preferred embodiments thereof, with reference to the attached drawings, in which:

[0020] **Figure 1** is a plan view of a conductor pattern structure of a capacitive touch panel in accordance with a first embodiment of the present invention;

[0021] **Figure 2** is a perspective view of a portion of the conductor pattern structure of the capacitive touch panel of the present invention;

[0022] **Figure 3** is a cross-sectional view taken along line **3-3** of **Figure 2**;

[0023] **Figure 4** is a cross-sectional view taken along line **4-4** of **Figure 2**;

[0024] **Figure 5** illustrates a user's finger physically engaging a point on the capacitive touch panel in accordance with the present invention;

[0025] **Figure 6** illustrates the user's finger engaging a different point on the capacitive touch panel of the present invention;

[0026] **Figure 7** illustrates a schematic view of a surface of a substrate on which a plurality of first-axis conductor cells, first-axis conduction lines, signal transmission lines, and second-axis conductor cells are formed;

[0027] **Figure 8** illustrates a schematic view of the substrate surface on which an insulation layer is formed to cover the surface of each first-axis conduction line, after the step of **Figure 7**;

[0028] **Figure 9** illustrates a schematic view of the substrate surface on which a second-axis conduction line is formed to connect between each pair of adjacent second-axis conductor cells of the same second-axis conductor assembly, after the step of **Figure 8**; and

[0029] **Figure 10** is a plan view of a conductor pattern structure of a capacitive touch panel in accordance with a second embodiment of the present invention.

DETAILED DESCRIPTION

[0030] With reference to the drawings and in particular to **Figures 1** and **2**, of which **Figure 1** illustrates a plan view of a conductor pattern structure of a capacitive touch panel in accordance with a first embodiment of the present invention and **Figure 2** illustrates a perspective view of a portion of the conductor pattern structure of the capacitive touch panel, generally designated with reference numeral **12**, is formed on a surface **11** of a substrate **1**. The conductor pattern structure **12** comprises a plurality of conductor assemblies **13** extending along a first axis, which will be referred to as "first-axis conductor assemblies", and a plurality of conductor assemblies **14** extending along a second axis, which will be referred to as "second-axis conductor assemblies". Each of the first-axis conductor assemblies **13** is parallel to other first-axis conductor assemblies **13**, and each of the second-axis conductor assemblies **14** is parallel to other second-axis conductor assemblies **14**. The first-axis conductor assemblies **13** are substantially perpendicular to the second-axis conductor assemblies **14**. However, it is apparent that the first-axis conductor assemblies **13** and the second-axis conductor assemblies **14** can be arranged on the surface **11** of the substrate **1** at an included angle therebetween that is other than a right angle.

[0031] Each first-axis conductor assembly **13** is composed of a plurality of first-axis conductor cells **131** that are lined up along the first axis, which is designated at "**X**" in the drawings, on the surface **11** of the substrate **1** in a substantially equally-spaced manner and a disposition zone **15** is delimited between adjacent first-axis conductor assemblies **13** and adjacent first-axis conductor cells **131**.

[0032] A first-axis conduction line **132** connects between adjacent first-axis conductor cells **131** positioned along the first axis **X** so that the first-axis conductor cells **131** along the first axis **X** are electrically connected together to form a first-axis conductor assembly **13**. In other words, the first-axis conductor cells **131** of the same first-axis conductor assembly **13** are connected together in cascade by the first-axis conduction lines **132**. Each first-axis conductor assembly **13** is further connected to a signal transmission line **16a** for transmitting a signal to a control circuit laid on a circuit board (both not shown).

[0033] Each of the conduction lines **132** has a surface **133** that is covered by an insulation covering layer **17**, which is made of a material featuring electric insulation, and preferably a transparent insulation material, such as silicon dioxide. Each second-axis conductor assembly **14** is composed of a plurality of second-axis conductor cells **141** that are lined up along the second axis, which is designated at "**Y**" in the drawings, in a substantially equally-spaced manner on the surface **11** of the substrate **1**. Each second-axis conductor cell **141** is set in the respective second-axis conductor cell disposition zone **15**.

[0034] A second-axis conduction line **142** connects between adjacent second-axis conductor cells **141** positioned along the second axis **Y** and extends over and across a surface of each insulation layer **17** so that the second-axis conductor cells **141** of the same second-axis conductor assembly **14** are connected together. In other words, the second-axis conductor cells **141** of the same second-axis conductor assembly **14** are connected together in cascade by the second-axis conduction lines **142**. Each second-axis conductor assembly **14** is further connected to a signal transmission line **16b** for transmitting a signal to the control circuit.

[0035] Also referring to **Figure 3**, which shows a cross-sectional view taken along line **3-3** of **Figure 2**, and **Figure 4**, which shows a cross-sectional view taken along line **4-4** of **Figure 2**, the first-axis conductor cells **131**, the first-axis conduction lines **132**, the second-axis conductor cells **141**, and the second conduction lines **142** are made of transparent conductive material. The insulation layer **17** is interposed between the respective first-axis conduction line **132** and the second-axis conduction line **142** so that the second-axis conduction line **142** that connects adjacent second-axis conductor cells **141** of the second-axis conductor assembly **14** extends across the respectively first-axis conduction line **132** in a mutually-insulated manner.

[0036] The substrate **1** can be a glass substrate, and the first-axis conductor assemblies **13** and the second-axis conductor assemblies **14**, and the first-axis and second-axis conduction lines **132**, **142** are made of transparent conductive film, such as ITO conductive film. In the embodiment illustrated, the first-axis conductor cells **131** and the second-axis conductor cells **141** are of a shape of substantially hexagon geometry contour. It is apparent that the conductor cells **131**, **141** can be of shapes of other geometry contours to effect an optimum distribution of effective conductor surface.

[0037] **Figure 5** demonstrates a user's finger physically engaging a point on the capacitive touch panel in accordance with the present invention, and **Figure 6** demonstrates the user's finger engaging a different point on the capacitive touch panel of the present invention. When a user put his or her finger to touch a contact area (point), designated at "**A**", on the capacitive touch panel of the present invention, the first-axis conductor cell **131** of the first-axis conductor assembly **13** and the second-axis conductor cell **141** of the second-axis conductor assembly **14**, which are covered by the contact area **A**, induce a capacitor effect therebetween and a signal caused thereby is transmitted through the signal transmission lines **16a**, **16b** to the control circuit. The control circuit may then carry out computation to determine on which point on the surface **11** of the substrate **1** the contact area **A** is set.

[0038] When the user moves his or her finger to another contact area **B**, the first-axis conductor cell **131** of the first-axis conductor assembly **13** and the second-axis conductor cell **141** of the second-axis conductor assembly **14**, which are covered by the contact area **B**, induce a capacitor effect therebetween and a change occurs, which induces a signal that is transmitted through the signal transmission lines **16a**, **16b** to the control circuit. The control circuit may then carry out computation to determine on which point on the surface **11** of the substrate **1** the contact area **B** is set.

[0039] **Figures 7** and **8** are schematic plan views demonstrating manufacturing steps of the conductor pattern of the capacitive touch panel in accordance with the present invention, wherein **Figure 7** illustrates the schematic view of a surface of a substrate on which a plurality of first-axis conductor cells **131**, first-axis conduction lines **132**, signal transmission lines **16a**, **16b**, and second-axis conductor cells **141** are just formed, and **Figure 8** illustrates the schematic view of the substrate surface on which an insulation covering layer **17** is formed to cover the surface of each first-axis conduction line **132**, after the step of **Figure** 7. Further, **Figure 9** illustrates a schematic view of the substrate surface on which a second-axis conduction line **142** is formed to connect between each pair of adjacent second-axis conductor cells **141** of the same second-axis conductor assembly, after the step of **Figure 8**, to thereby complete the manufacturing of the conductor pattern structure of the touch panel in accordance with the present invention.

[0040] The manufacturing of the conductor pattern structure **12** can be carried out with any known techniques, such as etching, sputtering, and screen printing. Etching is taken as an example for manufacture of the conductor pattern structure as follows. First of all, a conductor film, of which an ITO transparent conductive film is an example, is formed on the surface **11** of a cleaned substrate **1**. Thereafter, screen printing is employed to carry out etching mask printing process.

[0041] After the etching mask printing process, etching is carried out on the surface **11**, followed by film stripping. Thus, the first-axis conductor cells **131** of the first-axis conductor assemblies **13**, the first conduction lines **132**, and the second-axis conductor cells **141** of the second-axis conductor assemblies **14**, all being transparent and electrically conductive, are formed on the substrate surface **11**, as shown in **Figure 7**. At this point, all the first-axis conductor cells **131** of the same first-axis conductor assemblies **13** are electrically connected together and the first-axis conductor assemblies **13** are further connected to a plurality of signal transmission lines **16a**.

[0042] Thereafter, an insulation covering layer **17** is applied to cover the surface **133** of each first-axis conduction line **132**, as shown in **Figure 8**. Then, a mask is formed with the printing technique to define the positions of the second-axis conduction lines **142**, followed by application of a transparent conductive layer to form the second-axis conduction lines **142** whereby the adjacent second-axis conductor cells **141** along the second axis **Y** are each connected by the second-axis conduction lines **142** with each second-axis conduction line **142** extending over and across the surface of the respective insulation layer **17**, as shown in **Figure 9**. Once the step is done, all second-axis conductor cells **141** of the same second-axis conductor assemblies **14** are electrically connected together and the second-axis conductor assemblies **14** are connected to the signal transmission lines **16b**.

[0043] When the etching technique described above is taken to form the conductor cells and the conduction lines on the substrate surface, different pattern can be formed with etching areas defined by different etching masks to similarly form a conductor pattern structure. For example, in the first etching step, only the first-axis conductor cells **131** and the first-axis conduction lines **132** of the first-axis conductor assemblies **13** are formed on the substrate surface **11**, but not the second-axis conductor cells **141** of the second-axis conductor assemblies **14**. Thereafter, the same etching technique is taken again to form the second-axis conductor cells **141** and the second-axis conduction lines **142** on the substrate surface **11**, with the second conduction lines **142** extending over and across the surfaces of the associated insulation layers **17**.

[0044] In the embodiment discussed previously, the first-axis conductor cells and the second-axis conductor cells are each formed on the substrate in an array form to constitute the conductor pattern structure of the capacitive touch panel. Based on the same philosophy, a small number of conductor cells can also be used to construct a conductor pattern structure of the capacitive touch panel. This is illustrated in **Figure 10** as a second embodiment of the disclosure, wherein two adjacent first-axis conductor cells **31, 32** are formed on a surface **21** of a substrate **2** and a signal transmission line **34** is connected to the conductor cell **32**. A first-axis conduction line **33** connects between the adjacent first-axis conductor cells **31, 32.** An insulation layer **4** is formed on a surface of the first-axis conduction line **33**.

[0045] Along an axis that is different from the first-axis conductor cells **31**, **32**, two adjacent second-axis conductor cells **51**, **52** are arranged and a second-axis conduction lines **53** connects between the adjacent second-axis conductor cells **51**, **52** by extending over and across a surface of the insulation layer **4**. The conductor cell **52** is also connected to a signal transmission line **54**.

[0046] Although the present invention has been described with reference to the preferred embodiments thereof, it is apparent to those skilled in the art that a variety of modifications and changes may be made without departing from the scope of the present invention which is intended to be defined by the appended claims.

Electronic Patent Application Fee Transmittal

Application Number:	
Filing Date:	
Title of Invention:	CONDUCTOR PATTERN STRUCTURE OF CAPACITIVE TOUCH PANEL
First Named Inventor/Applicant Name:	Ching-Yang Chang
Filer:	Thomas Schneck/Merle Garcia
Attorney Docket Number:	TVM-002
Filed as Small Entity	

Utility Filing Fees

Description	Fee Code	Quantity	Amount	Sub-Total in USD($)
Basic Filing:				
Utility filing Fee (Electronic filing)	4011	1	75	75
Utility Search Fee	2111	1	250	250
Utility Examination Fee	2311	1	100	100
Pages:				
Claims:				
Miscellaneous-Filing:				
Petition:				
Patent-Appeals-and-Interference:				

Description	Fee Code	Quantity	Amount	Sub-Total in USD($)
Post-Allowance-and-Post-Issuance:				
Extension-of-Time:				
Miscellaneous:				
		Total in USD ($)		**425**

Electronic Acknowledgement Receipt

EFS ID:	2108527
Application Number:	11842747
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Confirmation Number:	3897
Title of Invention:	CONDUCTOR PATTERN STRUCTURE OF CAPACITIVE TOUCH PANEL
First Named Inventor/Applicant Name:	Ching-Yang Chang
Customer Number:	03897
Filer:	Thomas Schneck/Merle Garcia
Filer Authorized By:	Thomas Schneck
Attorney Docket Number:	TVM-002
Receipt Date:	21-AUG-2007
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Document Number	Document Description	File Name	File Size(Bytes) /Message Digest	Multi Part /.zip	Pages (if appl.)

1	Abstract	TVM-002abstract.pdf	37398 3aea0708e811d2652fba50d46bbe9666a42e5e3a	no	1
Warnings:					
Information:					
2	Application Data Sheet	sb0014_fill.pdf	1646214 352c19a6d0fd34b9f73c374f37fe4d978a5c553f	no	4
Warnings:					
Information:					
3	Claims	TVM-002claims.pdf	187234 30e2f48781b383650a8abeffc09d18e810bdf335	no	3
Warnings:					
Information:					
4	Drawings	TVM-002drawings.pdf	290524 ffb24b7a48be5a921c548960294fe90dc154e810	no	5
Warnings:					
Information:					
5	Oath or Declaration filed	TVM-002declaration.pdf	235938 9aae11e519a8bb09c81919ee1d60ecd3281fb6db	no	3
Warnings:					
Information:					
6	Specification	TVM-002description.pdf	1266074 74baa5acd708c53b1c1ae1da95e7d651eab00be5	no	12
Warnings:					
Information:					
7	Fee Worksheet (PTO-06)	fee-info.pdf	8396 c2b28d436ff4f9760130a6e64682f0f7a5992098	no	2
Warnings:					
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		Total Files Size (in bytes):	3671778		

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If a new application is being filed and the application includes the necessary components for a filing date (see 37 CFR 1.53(b)-(d) and MPEP 506), a Filing Receipt (37 CFR 1.54) will be issued in due course and the date shown on this Acknowledgement Receipt will establish the filing date of the application.

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

If a timely submission to enter the national stage of an international application is compliant with the conditions of 35 U.S.C. 371 and other applicable requirements a Form PCT/DO/EO/903 indicating acceptance of the application as a national stage submission under 35 U.S.C. 371 will be issued in addition to the Filing Receipt, in due course.

New International Application Filed with the USPTO as a Receiving Office

If a new international application is being filed and the international application includes the necessary components for an international filing date (see PCT Article 11 and MPEP 1810), a Notification of the International Application Number and of the International Filing Date (Form PCT/RO/105) will be issued in due course, subject to prescriptions concerning national security, and the date shown on this Acknowledgement Receipt will establish the international filing date of the application.

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U.S. Patent and Trademark Office; U.S. DEPARTMENT OF COMMERCE

PATENT APPLICATION FEE DETERMINATION RECORD

Substitute for Form PTO-875

11/842,747

APPLICATION AS FILED – PART I

FOR	NUMBER FILED (Column 1)	NUMBER EXTRA (Column 2)	SMALL ENTITY RATE ($)	SMALL ENTITY FEE ($)		OTHER THAN SMALL ENTITY RATE ($)	OTHER THAN SMALL ENTITY FEE ($)
BASIC FEE (37 CFR 1.16(a), (b), or (c))				75			
SEARCH FEE (37 CFR 1.16(k), (i), or (m))				250			
EXAMINATION FEE (37 CFR 1.16(o), (p), or (q))				100			
TOTAL CLAIMS (37 CFR 1.16(i))	10 minus 20 =		X 25=		OR	X 50=	
INDEPENDENT CLAIMS (37 CFR 1.16(h))	2 minus 3 =		X 100=			X 200=	
APPLICATION SIZE FEE (37 CFR 1.16(s))	If the specification and drawings exceed 100 sheets of paper, the application size fee due is $250 ($125 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))			N/A			N/A	
			TOTAL	425		TOTAL	

* If the difference in column 1 is less than zero, enter "0" in column 2.

APPLICATION AS AMENDED – PART II

AMENDMENT A	CLAIMS REMAINING AFTER AMENDMENT (Column 1)		HIGHEST NUMBER PREVIOUSLY PAID FOR (Column 2)	PRESENT EXTRA (Column 3)	SMALL ENTITY RATE ($)	SMALL ENTITY ADDITIONAL FEE ($)	OR	OTHER THAN SMALL ENTITY RATE ($)	OTHER THAN SMALL ENTITY ADDITIONAL FEE ($)
Total (37 CFR 1.16(i))	*	Minus	**	=	X =		OR	X =	
Independent (37 CFR 1.16(h))	*	Minus	***	=	X =		OR	X =	
Application Size Fee (37 CFR 1.16(s))									
FIRST PRESENTATION OF MULTIPLE DEPENDENT CLAIM (37 CFR 1.16(j))					N/A		OR	N/A	
					TOTAL ADD'T FEE		OR	TOTAL ADD'T FEE	

OR

AMENDMENT B	CLAIMS REMAINING AFTER AMENDMENT (Column 1)		HIGHEST NUMBER PREVIOUSLY PAID FOR (Column 2)	PRESENT EXTRA (Column 3)	SMALL ENTITY RATE ($)	SMALL ENTITY ADDITIONAL FEE ($)	OR	OTHER THAN SMALL ENTITY RATE ($)	OTHER THAN SMALL ENTITY ADDITIONAL FEE ($)
Total (37 CFR 1.16(i))	*	Minus	**	=	X =		OR	X =	
Independent (37 CFR 1.16(h))	*	Minus	***	=	X =		OR	X =	
Application Size Fee (37 CFR 1.16(s))									
FIRST PRESENTATION OF MULTIPLE DEPENDENT CLAIM (37 CFR 1.16(j))					N/A		OR	N/A	
					TOTAL ADD'T FEE		OR	TOTAL ADD'T 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.

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APPLICATION NUMBER	FILING or 371(c) DATE	GRP ART UNIT	FIL FEE REC'D	ATTY.DOCKET.NO	TOT CLAIMS	IND CLAIMS
11/842,747	08/21/2007	2629	425	TVM-002	10	2

CONFIRMATION NO. 3897

FILING RECEIPT

3897
SCHNECK & SCHNECK
P.O. BOX 2-E
SAN JOSE, CA95109-0005

Date Mailed: 08/30/2007

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 write to the Office of Initial Patent Examination's Filing Receipt Corrections. 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**

Applicant(s)

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Assignment For Published Patent Application

TRENDON TOUCH TECHNOLOGY CORP., Taipei, TAIWAN

Power of Attorney: The patent practitioners associated with Customer Number 003897

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Projected Publication Date: 10/30/2008

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Early Publication Request: No

** SMALL ENTITY **

Title

Preliminary Class

345

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

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

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

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

For information on preventing theft of your intellectual property (patents, trademarks and copyrights), you may wish to consult the U.S. Government website, http://www.stopfakes.gov. Part of a Department of Commerce initiative, this website includes self-help "toolkits" giving innovators guidance on how to protect intellectual property in specific countries such as China, Korea and Mexico. For questions regarding patent enforcement issues, applicants may call the U.S. Government hotline at 1-866-999-HALT (1-866-999-4158).

LICENSE FOR FOREIGN FILING UNDER

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Title 37, Code of Federal Regulations, 5.11 & 5.15

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WASHINGTON, D.C. 20231
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APPLICATION NUMBER	FILING DATE	FIRST NAMED APPLICANT	ATTORNEY DOCKET NUMBER
11/842,747	08/21/2007	Ching-Yang Chang	TVM-002

CONFIRMATION NO. 3897

08/30/07

NOTICE OF INFORMAL APPLICATION

This application is considered to be informal since it does not comply with the regulations for the reason(s) indicated below. The period within to correct the informalities noted below and avoid abandonment is set in the accompanying Office action.

Items Required To Avoid Processing Delays:

The item(s) indicated below are also required and should be submitted with any reply to this notice to avoid further processing delays.

A new oath or declaration, identifying this application number, or, if appropriate, an application data sheet (37 CFR 1.76), is required. The oath or declaration does not comply with 37 CFR 1.63 in that it:

- does not identify the citizenship of each inventor.

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Patents and Trademarks

November 13, 2007

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

Re: Certified Copy of Priority Document
U.S. Serial No.: 11/842,747
Filed: August 21, 2007
For: CONDUCTOR PATTERN STRUCTURE OF CAPACITIVE TOUCH PANEL
Inventors: Ching-Yang Chang et al.
Our ref: TVM-002

Dear Sir or Madam:

Transmitted herewith for the above-identified patent application is a certified copy of the priority document, Taiwan application no. 96115152, filed April 27, 2007.

Respectfully submitted,

D J Schneck

David Schneck
Reg. No. 43,094
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(408) 297-9733

CERTIFICATE OF MAILING

I hereby certify that this paper (along with any paper referred to as being attached or enclosed) is being deposited with the United States Postal Service on the date shown below with sufficient postage as first class mail in an envelope addressed to: Commissioner for Patents, P.O. Box 1450, Alexandria, Virginia 22313-1450.

Signed: Merle P. Garcia
Typed Name: Merle P. Garcia

Date: November 13, 2007

DS:mpg

Encl: Certified copy of priority document
Return post card

中華民國經濟部智慧財產局

INTELLECTUAL PROPERTY OFFICE
MINISTRY OF ECONOMIC AFFAIRS
REPUBLIC OF CHINA

證明所附文件，係本局存檔中原申請案的副本，正確無訛，
申請資料如下 ：

s is to certify that annexed is a true copy from the records of this
ice of the application as originally filed which is identified hereunder :

請　　日 ： 西元 2007 年 04 月 27 日
ication Date　　　Apr 27, 2007

請 案 號 ： 096115152
cation No.

請　　人 ： 宸鴻光電科技股份有限公司
cant(s)

局　　長
Director General

蔡練生

西元 2007 年 05 月 07 日
May 7, 2007

發明專利說明書

（本說明書格式、順序及粗體字，請勿任意更動，※記號部分請勿填寫）

※申請案號：

※申請日期：　　　　　　　　　　※IPC 分類：

一、發明名稱：（中文/英文）

電容式觸控板之觸控圖型結構

二、申請人：（共 1 人）

姓名或名稱：（中文/英文）

宸鴻光電科技股份有限公司

代表人：（中文/英文）

盧鐘雄

住居所或營業所地址：（中文/英文）

114 台北市內湖區瑞光路 513 巷 22 弄 5 號 2 樓之 1

國　籍：（中文/英文）

中華民國

三、發明人：（共 1 人）

姓　名：（中文/英文）

張慶陽

國　籍：（中文/英文）：

中華民國

四、聲明事項：

☐ 主張專利法第二十二條第二項☐第一款或☐第二款規定之事實，其事實發生日期為：　年　月　日。

☐ 申請前已向下列國家（地區）申請專利：

【格式請依：受理國家（地區）、申請日、申請案號　順序註記】

☐ 有主張專利法第二十七條第一項國際優先權：

1.

2.

☐ 無主張專利法第二十七條第一項國際優先權：

☐ 主張專利法第二十九條第一項國內優先權：

【格式請依：申請日、申請案號　順序註記】

☐ 主張專利法第三十條生物材料：

☐ 須寄存生物材料者：

國內生物材料　【格式請依：寄存機構、日期、號碼　順序註記】

國外生物材料　【格式請依：寄存國家、機構、日期、號碼　順序註記】

☐ 不須寄存生物材料者：

所屬技術領域中具有通常知識者易於獲得時，不須寄存。

五、中文發明摘要：

一種電容式觸控板之觸控圖型結構，係在一基板之基板表面上配置有複數個第一軸向導電群組及複數個第二軸向導電群組，每一個第一軸向導電群組由複數個第一軸向導電單元所組成，並由複數個第一軸向導線予以連接，以將同一個第一軸向導電群組中之各個第一軸向導電單元予以連接。複數個絕緣覆層，一一地覆設於該各個第一軸向導線之表面。該每一個第二軸向導電群組亦由複數個第二軸向導電單元所組成。複數個第二軸向導線一一地連接於該第二軸向導電群組之各個相鄰之第二軸向導電單元之間，且該各個第二軸向導線係橫越過對應之第一軸向導線上之絕緣覆層之表面。

六、英文發明摘要：

七、指定代表圖：

(一)本案指定代表圖為：第 2 圖

(二)本代表圖之元件代表符號簡單說明：

1	基板
11	基板表面
13	第一軸向導電群組
131	第一軸向導電單元
132	第一軸向導線
133	導線表面
14	第二軸向導電群組
141	第二軸向導電單元
142	第二軸向導線
15	第二軸向導電單元配置區
17	絕緣覆層
X	第一軸向
Y	第二軸向

八、本案若有化學式時，請揭示最能顯示發明特徵的化學式：

九、發明說明：

【發明所屬之技術領域】

本發明係關於一種觸控板之結構設計，特別是關於一種電容式觸控板之觸控圖型結構。

【先前技術】

觸控面板（Touch Panel）已大量運用於家電、通訊、電子資訊等產品應用上。如目前廣泛商用之個人數位助理（PDA）、各種家電設備、遊戲輸入介面等。藉由觸控板與顯示器之整合，可供使用者以手指或觸控筆依照顯示畫面上之功能選項點選輸入所欲執行之動作如個人數位助理（PDA）、各種家電設備、遊戲輸入介面，並且被利用到大眾系統查詢工具等，以提供便民效果之作業系統。

習知之觸控面板係在一基板表面佈設感應區域，其感應區域係用以感應人體之手指或感應筆之信號來達到觸控的目的。該感應區域所使用之材料大都採用透明導電薄膜(例如氧化銦錫 ITO)，使得使用者在操作時，藉由觸壓該透明導電薄膜對該顯示器上相對應畫面，達到觸控之功能。

目前所常採用之觸控原理概可分為電阻式、電容感應式、紅外線感應式、電磁感應式、音波感應式等不同的技術原理。其中該電容感應式觸控板之工作原理係利用排列之透明電極與人體之間的靜電結合所產生之電容變化，從所產生之誘導電流來檢測其觸控位置之座標。由於電容感應式觸控面板在透光度、硬度、準確率、反應時間、觸控

打點壽命、操作溫度、和起始力量各方面都具有較佳優勢，故目前已被大量採用。

為了要偵測出使用者以手指或感應筆觸碰於觸控面板上之位置，業者研發出各種不同之電容式感應觸碰感測技術。例如在美國專利第 6970160 號發明專利案中，揭露了一種格狀觸控感應系統，其可應用於偵測在一觸控感應面之觸控位置。該格狀觸控感應系統包括兩個電容感應層，其間以一中間隔絕材料分隔，以形成電容效應。每一電容感應層包括實質平行排列之導電元件。兩個電容感應層實質上彼此垂直。每一個導電元件包括一序列之菱形片，藉由狹窄之導電線連接在一起。每一電容感應層上之導電元件係電連接至應導線。一控制電路透過導線提供訊號至兩組導電元件，以在該表面被觸按時接收由感應元件所產生之感應訊號，及判斷在每一層之觸控位置。

美國專利第 4233522 號發明專利案中，揭露了一種電容式觸控板，其包括一陣列之觸控感應開關單元。每一個開關單元包括一第一對及第一第二對之串連電容，該電容係由同一訊號源所驅動。該陣列之開關單元之排列方法，使得第一對電容與第一組開關單元連接，例如列，以連接至一對應之第一複數個訊號偵測器。而第二對電容與第二組開關單元連接，例如欄，以連接至一對應之第二複數個訊號偵測器。每一對電容之接點係選擇性地接地或接到其他觸控電容裝置以驅動一選擇開關電池。

美國專利第 4733222 號發明專利案中，揭露了一種電

容變化敏感觸控感應陣列系統，其包括一陣列之電極、一陣列之驅動電線、一驅動訊號產生器及一陣列之感應電線。每一電極係由一串之導電線連接而成，形成陣列之列或欄。而每一驅動電線係電容連接至多個電極。該驅動訊號產生器會產生交替訊息封包至驅動電線。該感應線係電容連接至多個電極，使得當驅動訊號送到驅動電線時，可透過電極取得訊號。該電極的數目與驅動電線及感應電線的數目相同。依據感應電線產生訊號的值，微處理器提供操作者觸控的相關資訊。

美國專利第 5880411 號發明專利案中，揭露了一種辨識觸控面板觸控位置的方法，可辨識在觸控感應區之導電標的物。辨識訊號被送到主機控制電路以顯示這些觸控位置。美國專利第 6414671 號及第 5374787 號亦揭露了相似之結構。

美國專利第 7030860 號發明專利案中，揭露了一種透明的電容觸控感應系統，適合用於電子裝置之輸入。該電容感應器可用作一圖形使用界面之輸入裝置，特別係當覆蓋在如 LCD 螢幕之顯示裝置之頂面，以感應手指的位置及在顯示器的接觸範圍。

美國專利第 5459463 號發明專利案中，揭露了一種可將靠近偵測區之標的物定位之裝置及具有該裝置之透明鍵盤。該裝置包括第一組偵測區形成之偵測線，第二組偵測區形成之偵測欄，一將電子信號傳送至偵測線及偵測欄之掃描裝置及一可由掃描裝置判讀標的物位置之裝置。該偵

測線連接至感應區，且彼此平行排列；而偵測欄與偵測線垂直，間隔一小段距離。

美國專利第 6498590 號發明專利案中，揭露了一種多人使用觸控系統，其包括一個配置有天線的表面。一發射器傳送特殊可辨識訊號至每一個天線。接收器係電容連接至不同使用者，該接收器可接收該特殊可辨識訊號。當多個使用者同時觸按任何天線，一處理器會將一特定天線與一特定使用者聯結。

美國專利第 5847690 號發明專利案中，揭露了一種顯示及感應裝置，其整合了觸控感應及液晶顯示之液晶顯示模組，以偵測在一平面顯示螢幕之輸入。

【發明內容】

本發明所欲解決之技術問題

在各先前專利技術中，雖然皆揭露了可用來感測使用者觸碰觸控面板之功能，且該觸控面板亦皆佈設有觸控感測單元之結構，但該些先前專利技術大都是採用兩個電容感應層，其間以一隔絕材料予以分隔以形成電容效應之結構設計。在採行此類結構設計之觸控面板時，雖然都可以達到電容式觸控感應的功能，但整個觸控面板之結構厚度較厚，不利於輕薄之要求。再者，在實施該傳統的電容式觸控板結構時，其必須在基板之上下表面形成不同的電容感應層，再以例如基板貫孔、貫孔導電層、電路佈線之電路連接製程將各個相關導電單元予以連接，故在製程方面

較為繁雜。

緣此，本發明之主要目的即是提供一種電容式觸控板之薄形觸控圖型結構，該觸控圖型結構包括有複數個第一軸向導電群組及複數個第二軸向導電群組，每一個導電群組由複數個以導線連接之導電單元所組成，而在不同軸向之導線之間則以絕緣覆層予以隔離。

本發明之另一目的是提供一種以簡易製程即可完成之電容式觸控板觸控圖型結構，該觸控圖型結構之第一軸向導電群組及第二軸向導電群組中之各個導電單元及導線係以一般透明導電層之製程形成在基板的同一平面上。如此即可在使用者觸碰該觸控板之表面時，藉由被碰觸之第一軸向導電群組及複數個第二軸向導電群組之相鄰導電單元形成電容效應。

本發明解決問題之技術手段

本發明為解決習知技術之問題所採用之技術手段係於一基板之頂面佈設有一觸控圖型結構，且該觸控圖型結構區分為相互垂直之一第一軸向導電群組及一第二軸向導電群組，並等距間隔設置複數個第一軸向導電單元、及複數個第二軸向導電單元，其複數個導電單元間係分別以第一軸向連接層、第二軸向連接層相連接。複數個絕緣覆層，一一地覆設於該各個第一軸向導線之表面，以使各個第一軸向導線與第二軸向導線予以隔離。

本發明對照先前技術之功效

經由本發明所採用之技術手段，使得觸控圖型結構中之複數個第一軸向導電群組及複數個第二軸向導電群組之各個導電單元皆佈設在基板之同一平面，而可達到結構簡化、減少結構厚度之效果，而藉由該第一軸向導電群組及複數個第二軸向導電群組之相鄰導電單元被使用者碰觸時，依據相鄰導電單元被碰觸之面積差異，即可形成電容變化信號送至控制電路，以偵測使用者手指碰觸之位置。而在製作該觸控圖型結構之第一軸向導電群組及第二軸向導電群組中之各個導電單元及導線時，僅需以簡易佈線製程在基板的單一表面施行即可完成所需之觸控板觸控圖型結構，故在產業利用時，具有製程簡易、良率高、製作成本低之優勢。

本發明所採用的具體實施例，將藉由以下之實施例及附呈圖式作進一步之說明。

【實施方式】

參閱第 1 圖所示，其係顯示本發明電容式觸控板之觸控圖型結構之第一實施例平面示意圖，第 2 圖係顯示本發明電容式觸控板之觸控圖型結構之局部立體圖。本發明係於該基板 1 之基板表面 11 上設置一觸控圖型結構 12。該觸控圖型結構 12 分別包括有一第一軸向導電群組 13、一第二軸向導電群組 14，且該第一軸向導電群組 13 係垂直於該第二軸向導電群組 14。第一軸向導電群組 13 與第二

軸向導電群組 14 間，除了圖式所示之垂直對應關係之外，亦可以其它非垂直之對應角度佈設在基板 1 之基板表面 11 上。

每一個第一軸向導電群組 13 由複數個第一軸向導電單元 131 所組成，各個第一軸向導電單元 131 係以第一軸向 X 等距間隔設置在該基板 1 之基板表面 11，且在相鄰之第一軸向導電群組 13 之間與相鄰之兩個第一軸向導電單元 131 之間之區域各定義出一第二軸向導電單元配置區 15。

該各個相鄰之第一軸向導電單元 131 間，係以複數個第一軸向導線 132 相連接，以將同一個第一軸向導電群組 13 中之各個第一軸向導電單元 131 予以電連接。該同一個第一軸向導電群組 13 中之各個第一軸向導電單元 131 經數個第一軸向導線 132 串聯連接後，經由一信號傳輸線 16a 將訊號傳送於一電路板(未示)之控制電路。

該各個第一軸向導線 132 之導線表面 133 各覆設有一絕緣覆層 17。該絕緣覆層 17 係選自於具有電絕緣特性之材料，且最好是透明之絕緣材料(例如二氧化矽等材料)。該每一個第二軸向導電群組 14 係由複數個第二軸向導電單元 141 所組成，各個第二軸向導電單元 141 係以第二軸向 Y 等距間隔設置在該基板 1 之基板表面 11，且各個第二軸向導電單元 141 係一一地配置在該第二軸向導電單元配置區 15。

該各個相鄰之第二軸向導電單元 141 之間係以一第二軸向導線 142 相連接，且該第二軸向導線 142 係橫越過該

絕緣覆層 17 之表面，以將同一個第二軸向導電群組 14 中之各個第二軸向導電單元 141 予以連接。該同一個第二軸向導電群組 14 中之各個第二軸向導電單元 141 經數個第二軸向導線 142 串聯連接後，亦經由信號傳輸線 16b 將訊號傳送於控制電路。

參閱第 3 圖所示，其係顯示第 2 圖中 3-3 斷面之剖視圖，第 4 圖係顯示第 2 圖中 4-4 斷面之剖視圖。該第一軸向導電單元 131、第一軸向導線 132、第二軸向導電單元 141、第二軸向導線 142 係為透明導電材料所製成。該第一軸向導線 132 與第二軸向導線 142 之間設置之絕緣覆層 17 可使各個第二軸向導電群組 14 中之各相鄰第二軸向導電單元 141 間之第二軸向導線 142 在跨越對應之第一軸向導線 132 時，可達到彼此絕緣之目的。

該基板 1 係可為一玻璃基板，而該觸控圖型結構 12 之第一軸向導電群組 13 與第二軸向導電群組 14 及第一、第二軸向導線 132、141 係為透明導電薄膜(例如氧化銦錫 ITO 導電層)。前述之實施例中，各個第一軸向導電單元 131 與第二軸向導電單元 141 之形狀係為六邊形之幾何輪廓形狀，當然亦可設計成其它之幾何輪廓形狀，以在該基板 1 之基板表面 11 上形成密佈之最佳化有效觸控表面。

參閱第 5 圖所示，其係顯示使用者之手指觸碰本發明電容式觸控板之其中一位置區域時之示意圖，第 6 圖係顯示使用者之手指觸碰本發明電容式觸控板之另一位置區域時之示意圖。如圖所示，當使用者以手指觸碰本發明電容

式觸控板之其中一觸碰區域 A 時，該觸碰區域 A 所對應含蓋的第一軸向導電群組 13 之第一軸向導電單元 131 與第二軸向導電群組 14 之第二軸向導電單元 141 之間會形成電容效應，並由信號傳輸線 16a、16b 將訊號傳送至控制電路，再由該控制電路計算判斷出該觸碰區域 A 係位在該基板 1 之基板表面 11 之何處位置。

而當使用者移動手指至另一觸碰區域 B 時，該觸碰區域 B 所對應含蓋的第一軸向導電群組 13 之第一軸向導電單元 131 與第二軸向導電群組 14 之第二軸向導電單元 141 之間會形成之電容效應會產生變化，經由信號傳輸線 16a、16b 將訊號傳送至控制電路後，即可由該控制電路計算判斷出該經過位移後之觸碰區域 B 係位在該基板 1 之基板表面 11 之何處位置。

參閱第 7 圖及第 8 圖所示，其係顯示在製作本發明電容式觸控板之觸控圖型結構時之平面示意圖。其中，第 7 圖係顯示在一基板之基板表面上形成有數個第一軸向導電單元、第一軸向導線、信號傳輸線、與第二軸向導電單元之平面示意圖；第 8 圖係顯示在第 7 圖製程之後，於各個第一軸向導線之導線表面各覆設一絕緣覆層之平面示意圖；第 9 圖係顯示在第 8 圖製程之後，於各個第二軸向導電群組之各個相鄰第二軸向導電單元之間以第二軸向導線予連接而完成本發明觸控板之觸控圖型結構之平面示意圖。

在形成觸控圖型結構 12 時，可以採用習知蝕刻、濺

鍍、或網印之技術。以蝕刻技術製作觸控圖型結構為例，首先在一經清洗過之基板1之基板表面11形成一層導電薄膜(本實施例為氧化銦錫ITO透明導電層)，然後使用網版印刷技術(Screen Printing)進行防蝕遮罩印刷(Etching Mask Printing)之製程。

完成防蝕遮罩印刷製程後，即對該基板表面11進行蝕刻，再進行剝膜(Stripping)，如此即可在基板表面11上形成具有透明導電特性之第一軸向導電群組13之各個第一軸向導電單元131、第一軸向導線132與第二軸向導電群組14之各個第二軸向導電單元141(如第7圖所示)。此時，同一個第一軸向導電群組13中之各個第一軸向導電單元131即形成電連接，並由數條信號傳輸線16a引出。

然後，在各個第一軸向導線132之導線表面133各覆設一絕緣覆層17(如第8圖所示)。接著，以前述相同之印刷技術形成遮罩,以定義第二軸導線142的位置,再塗佈透明導電層以形成第二軸向導線142,如此即將各個相鄰第二軸向導電單元141之間以第二軸向導線142予以連接，而各個第二軸向導線142係橫越過對應絕緣覆層17之表面(如第9圖所示)。完成之後，即可使得同一個第二軸向導電群組14中之各個第二軸向導電單元141形成電連接，並由數條信號傳輸線16b引出。

在採行前述之蝕刻技術在基板表面形成各個導電單元及導線時，亦可以經由不同的蝕刻遮罩定義之蝕刻區域來蝕刻出不同的圖型，同樣能達到相同之觸控圖型結構。例

如，在第一次的蝕刻製程時，只在基板表面 11 上形成第一軸向導電群組 13 之各個第一軸向導電單元 131 及第一軸向導線 132，而不形成第二軸向導電群組 14 之各個第二軸向導電單元 141。然後，在各個第一軸向導線 132 之導線表面 133 各覆設一絕緣覆層 17。接著，以相同之蝕刻技術在基板表面 11 上形成各個第二軸向導電單元 141 及各個第二軸向導線 142，而各個第二軸向導線 142 係橫越過對應絕緣覆層 17 之表面。

在前述之實施例中，其第一軸向導電單元及第二軸向導電單元係以陣列之型態形成在基板上而構成電容式觸控板之觸控圖型結構。基於此一創作精神，亦可在實際之應用中以簡化的數個導電單元組成一電容式觸控板之觸控圖型結構。例如在第 10 圖中，其係顯示本發明電容式觸控板之觸控圖型結構之第二實施例平面圖。在此一實施例中，其係在一基板 2 之基板表面 21 上形成有兩個相鄰之第一軸向導電單元 31、32，其中該導電單元 32 連接有一信號傳輸線 34，相鄰之第一軸向導電單元 31、32 之間以一第一軸向導線 33 予以連接，並在該第一軸向導線 33 之表面覆設有一絕緣覆層 4。

在該兩個相鄰之第一軸向導電單元 31、32 之另一軸向位置，設有兩個相鄰之第二軸向導電單元 51、52，而一第二軸向導線 53 係橫越過該絕緣覆層 4 之表面而連接於該相鄰之第二軸向導電單元 51、52 之間，其中該導電單元 52 連接有一信號傳輸線 54。

由以上之實施例可知，本發明所提供之電容式觸控板之觸控圖型結構確具產業上之利用價值，故本發明業已符合於專利之要件。惟以上之敘述僅為本發明之較佳實施例說明，凡精於此項技藝者當可依據上述之說明而作其它種種之改良，惟這些改變仍屬於本發明之發明精神及以下所界定之專利範圍中。

【圖式簡單說明】

第 1 圖係顯示本發明電容式觸控板之觸控圖型結構之第一實施例平面圖；

第 2 圖係顯示本發明電容式觸控板之觸控圖型結構之局部立體圖；

第 3 圖係顯示第 2 圖中 3-3 斷面之剖視圖；

第 4 圖係顯示第 2 圖中 4-4 斷面之剖視圖；

第 5 圖係顯示使用者之手指觸碰本發明電容式觸控板之其中一位置區域時之示意圖；

第 6 圖係顯示使用者之手指觸碰本發明電容式觸控板之另一位置區域時之示意圖；

第 7 圖係顯示在一基板之基板表面上形成有數個第一軸向導電單元、第一軸向導線、信號傳輸線、與第二軸向導電單元之平面示意圖；

第 8 圖係顯示在第 7 圖製程之後，於各個第一軸向導線之導線表面各覆設一絕緣覆層之平面示意圖；

第 9 圖係顯示在第 8 圖製程之後，於各個第二軸向導電群

組之各個相鄰第二軸向導電單元之間以第二軸向導線予連接而完成本發明觸控板之觸控圖型結構之平面示意圖；

第 10 圖係顯示本發明電容式觸控板之觸控圖型結構之第二實施例平面圖。

【主要元件符號說明】

1	基板
11	基板表面
12	觸控圖型結構
13	第一軸向導電群組
131	第一軸向導電單元
132	第一軸向導線
133	導線表面
14	第二軸向導電群組
141	第二軸向導電單元
142	第二軸向導線
15	第二軸向導電單元配置區
16a、16b	信號傳輸線
17	絕緣覆層
2	基板
21	基板表面
31、32	第一軸向導電單元
33	第一軸向導線

34	信號傳輸線
4	絕緣覆層
51、52	第二軸向導電單元
53	第二軸向導線
54	信號傳輸線
A	觸碰區域
B	觸碰區域
X	第一軸向
Y	第二軸向

十、申請專利範圍：

1. 一種電容式觸控板之觸控圖型結構，係在一基板之基板表面上形成一觸控圖型結構，該觸控圖型結構包括有：

複數個第一軸向導電群組，每一個第一軸向導電群組由複數個第一軸向導電單元所組成，各個第一軸向導電單元係以第一軸向等距間隔設置在該基板之基板表面，且在相鄰之第一軸向導電群組之間與相鄰之第一軸向導電單元之間之區域各定義出一第二軸向導電單元配置區；

複數個第一軸向導線，一一地連接於該第一軸向導電群組之各個相鄰之第一軸向導電單元之間，以將同一個第一軸向導電群組中之各個第一軸向導電單元予以連接；

複數個絕緣覆層，一一地覆設於該各個第一軸向導線之表面；

複數個第二軸向導電群組，每一個第二軸向導電群組由複數個第二軸向導電單元所組成，各個第二軸向導電單元係以第二軸向等距間隔設置在該基板之基板表面，且各個第二軸向導電單元係一一地配置在該第二軸向導電單元配置區；

複數個第二軸向導線，一一地連接於該第二軸向導電群組之各個相鄰之第二軸向導電單元之間，以將同一個第二軸向導電群組中之各個第二軸向導電單元予以連

接，且該各個第二軸向導線係橫越過對應之第一軸向導線上之絕緣覆層之表面。

2. 如申請專利範圍第 1 項所述之電容式觸控板之觸控圖型結構，其中該各個第一軸向導電單元及第二軸向導電單元係以透明之導電材料所製成。

3. 如申請專利範圍第 1 項所述之電容式觸控板之觸控圖型結構，其中該各個第一軸向導線及第二軸向導線係以透明之導電材料所製成。

4. 如申請專利範圍第 1 項所述之電容式觸控板之觸控圖型結構，其中該絕緣覆層由透明的絕緣材料所製成。

5. 如申請專利範圍第 1 項所述之電容式觸控板之觸控圖型結構，其中該各個第一軸向導電單元及第二軸向導電單元係呈六邊形之幾何輪廓形狀。

6. 一種電容式觸控板之觸控圖型結構，係在一基板之基板表面上形成一觸控圖型結構，該觸控圖型結構係至少兩個相鄰之第一軸向導電單元及至少兩個相鄰之第二軸向導電單元組成，其中該相鄰之第一軸向導電單元之間以一第一軸向導線予以連接，其特徵在於該第一軸向導線之表面覆設有一絕緣覆層，而一第二軸向導線係橫越過

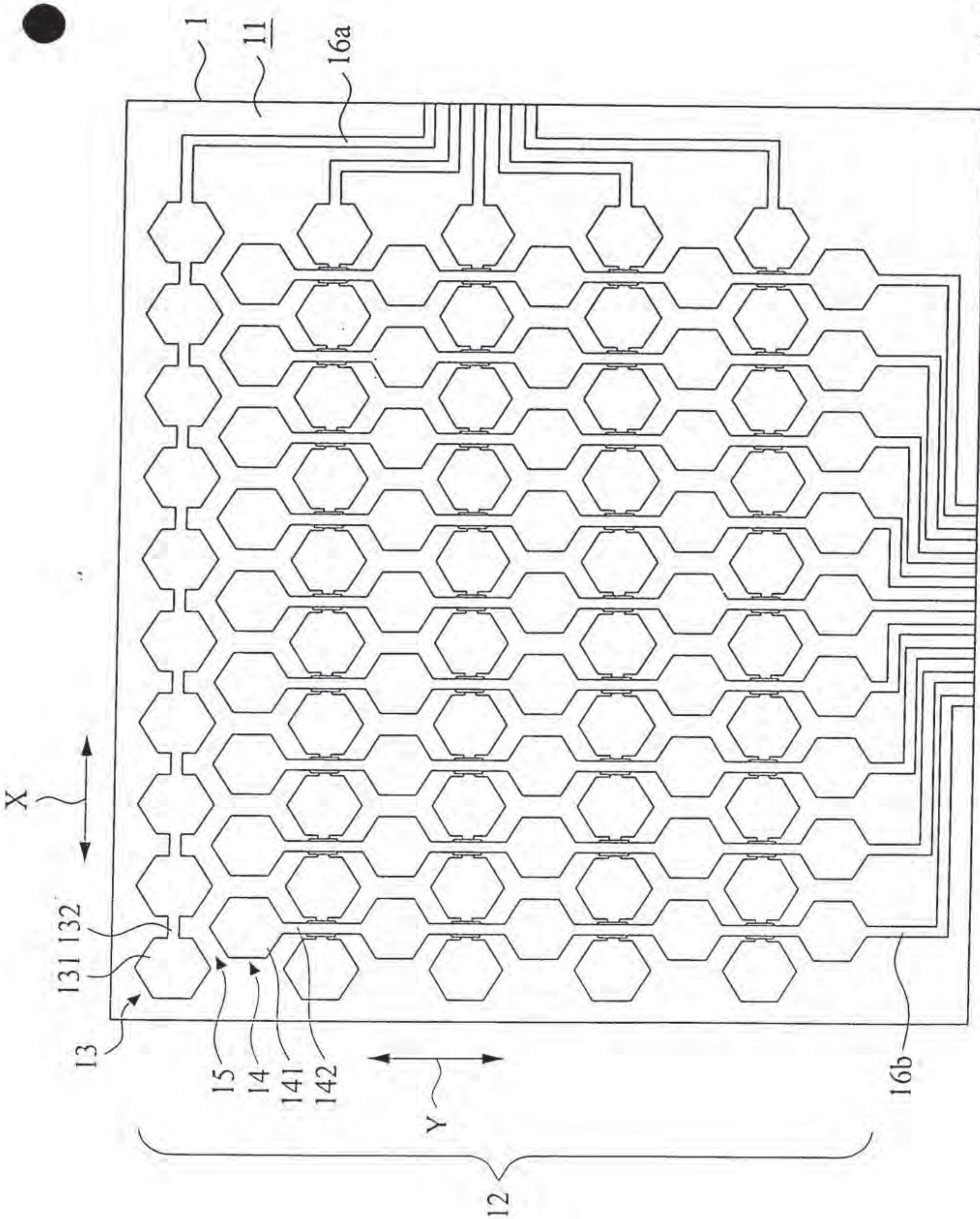
該絕緣覆層之表面而連接於該相鄰之第二軸向導電單元之間。

7. 如申請專利範圍第 6 項所述之電容式觸控板之觸控圖型結構，其中該第一軸向導電單元及第二軸向導電單元係以透明之導電材料所製成。

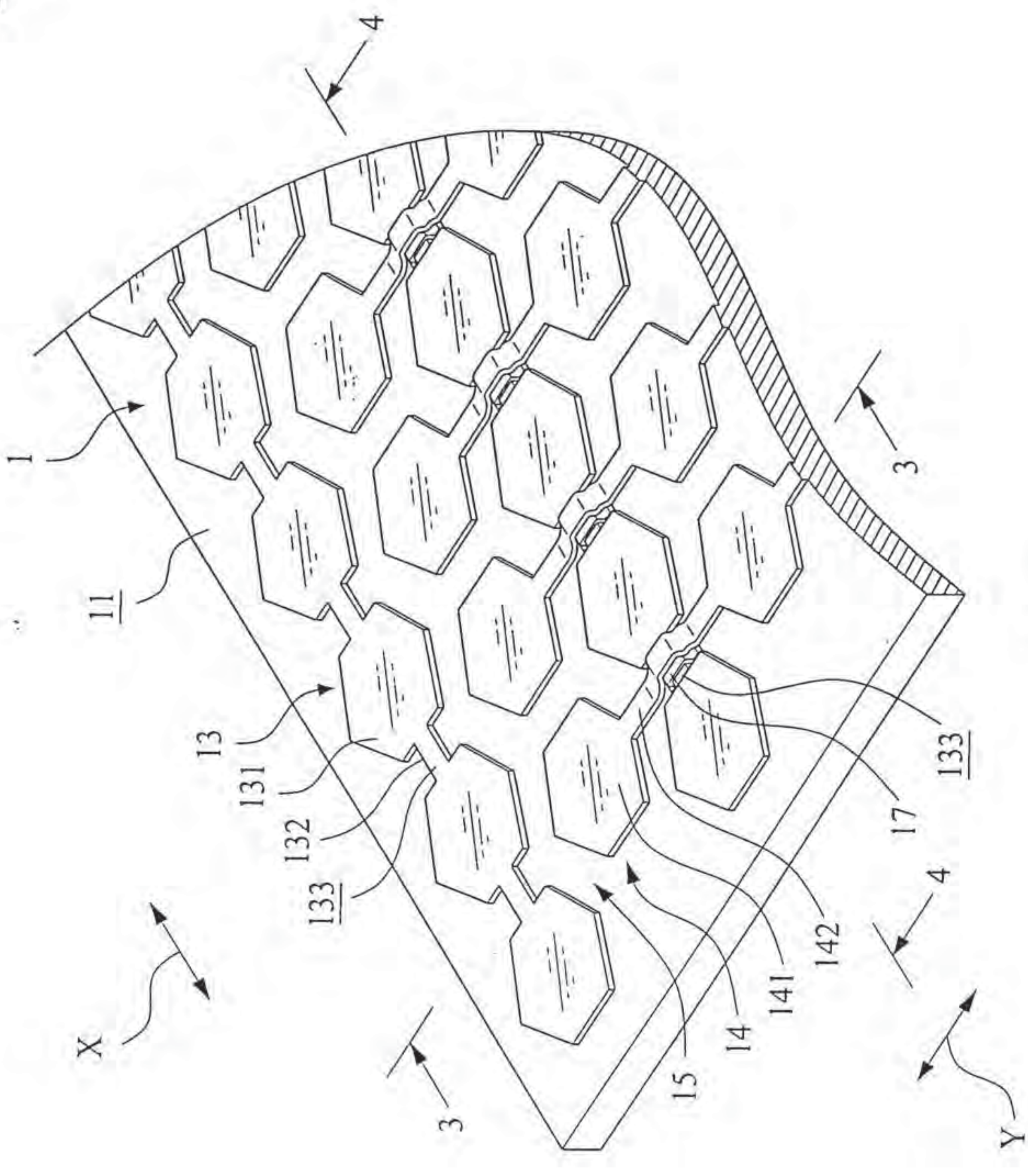
8. 如申請專利範圍第 6 項所述之電容式觸控板之觸控圖型結構，其中該第一軸向導線及第二軸向導線係以透明之導電材料所製成。

9. 如申請專利範圍第 6 項所述之電容式觸控板之觸控圖型結構，其中該絕緣覆層由透明的絕緣材料所製成。

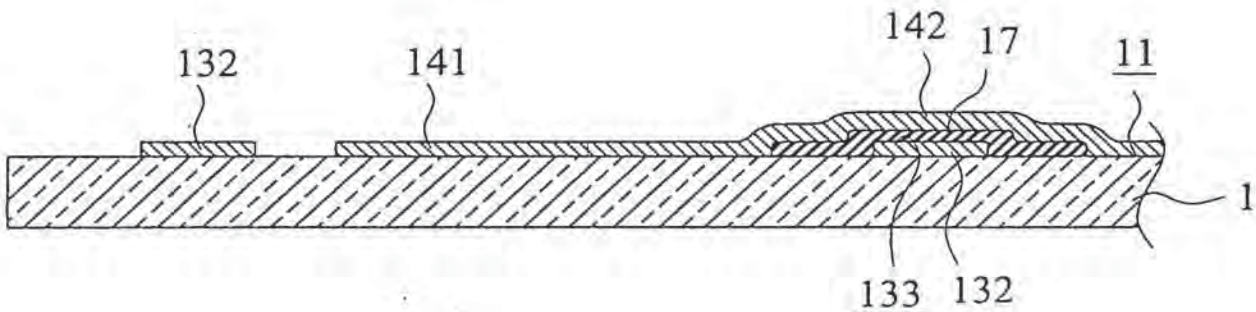
10. 如申請專利範圍第 6 項所述之電容式觸控板之觸控圖型結構，其中該第一軸向導電單元及第二軸向導電單元係呈六邊形之幾何輪廓形狀。



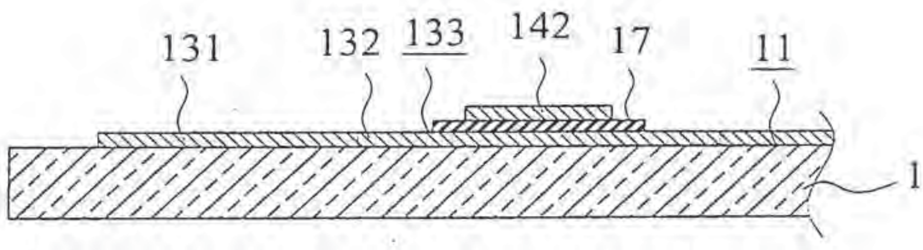
第1圖



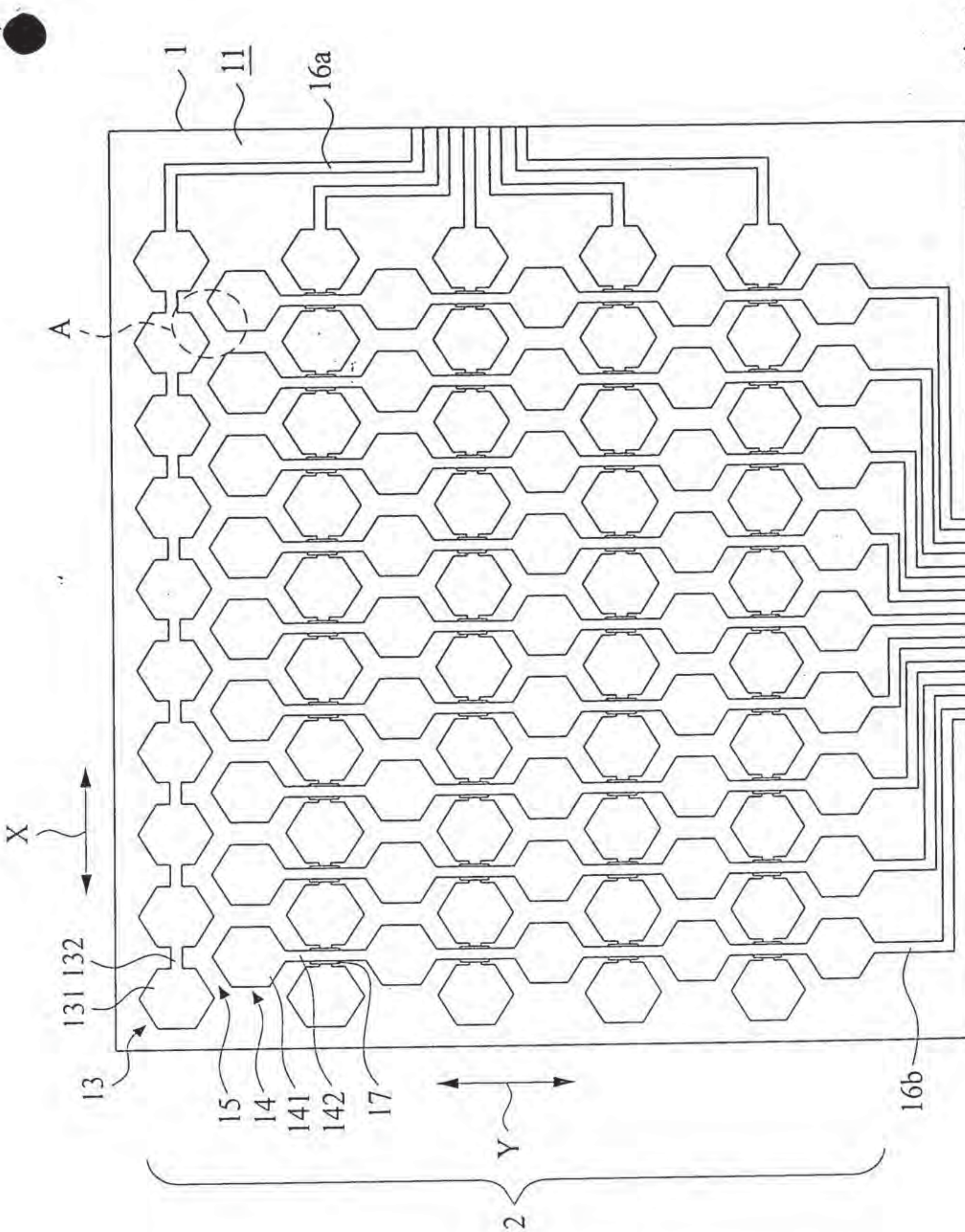
第2圖



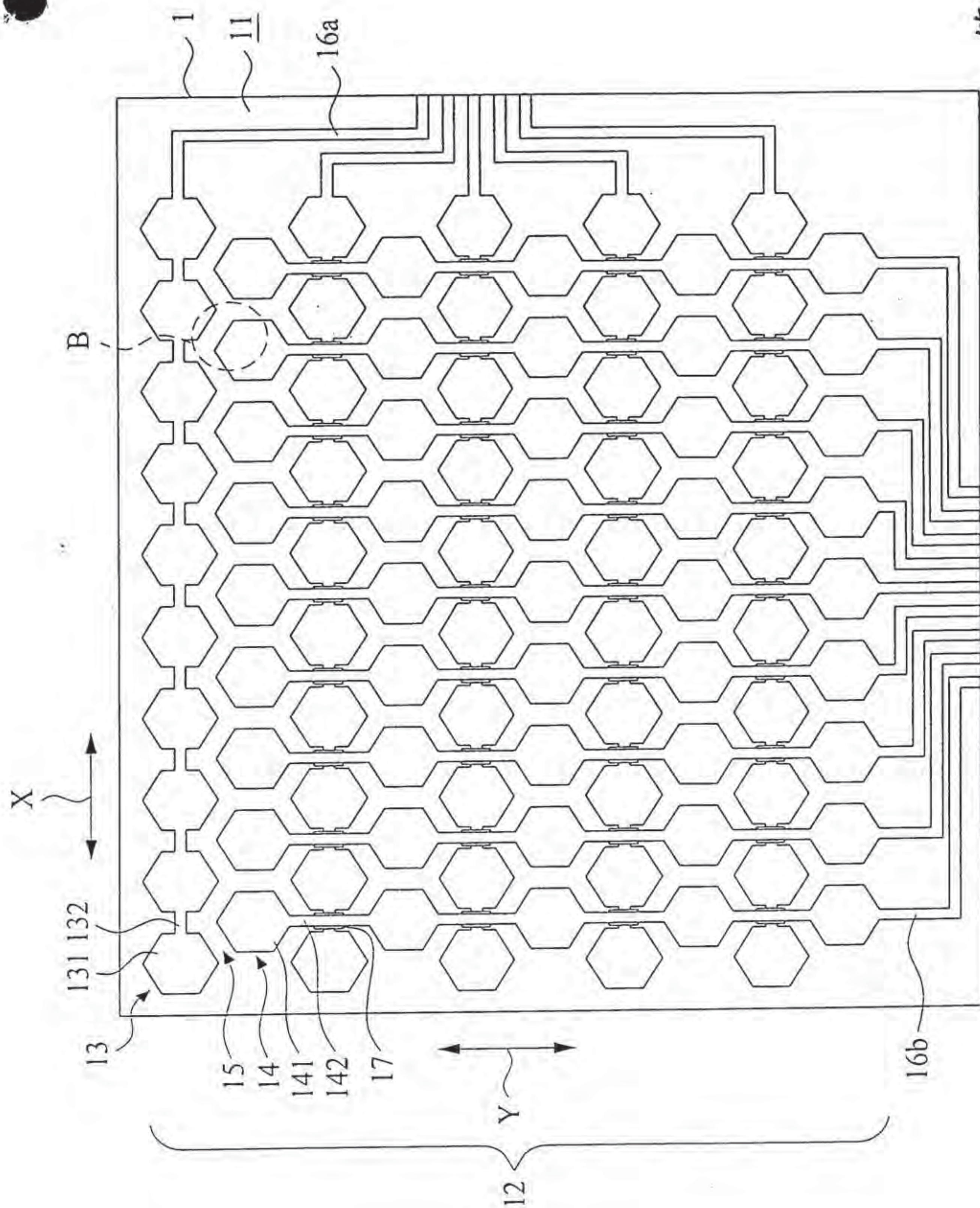
第3圖



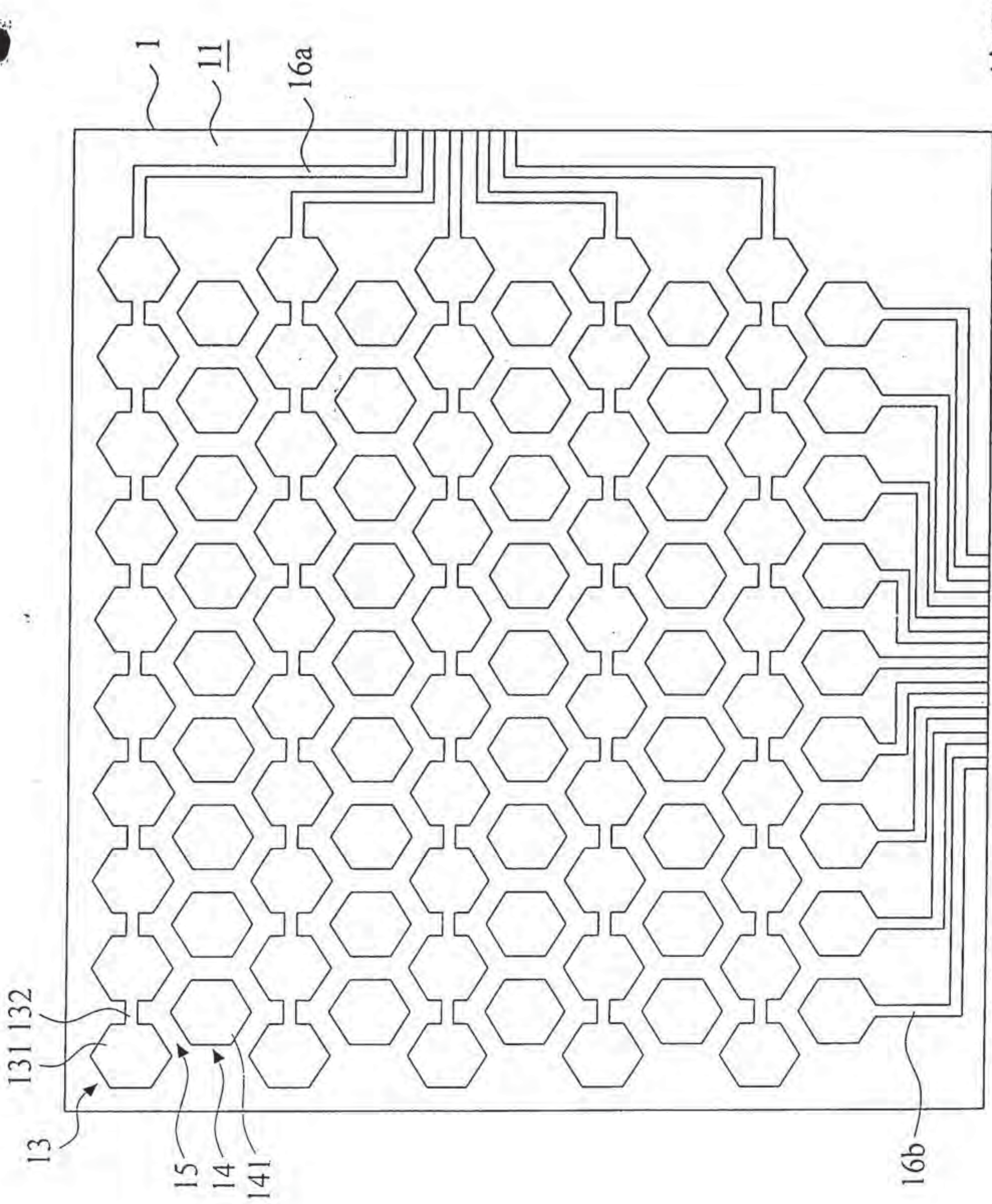
第4圖



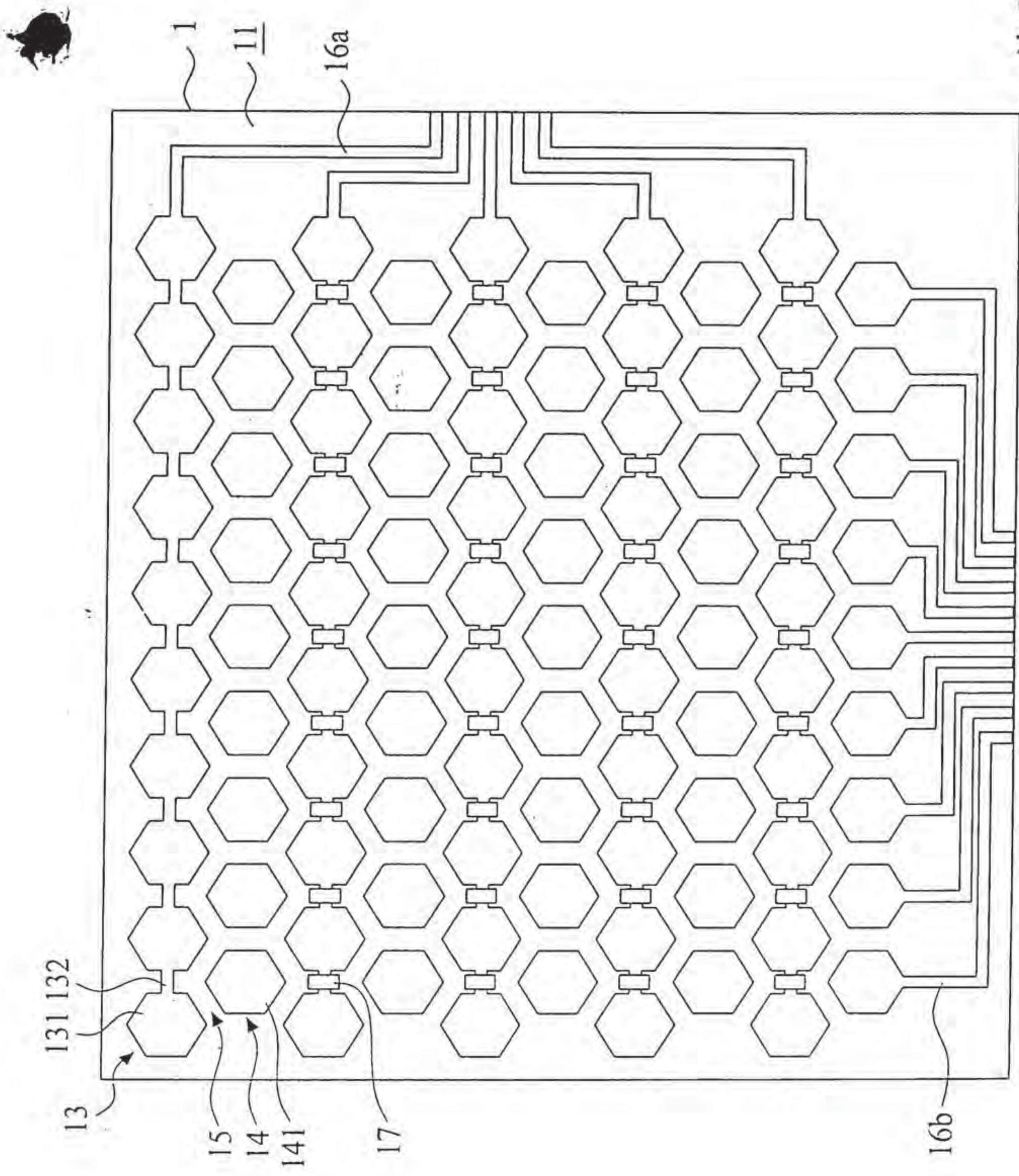
第5圖



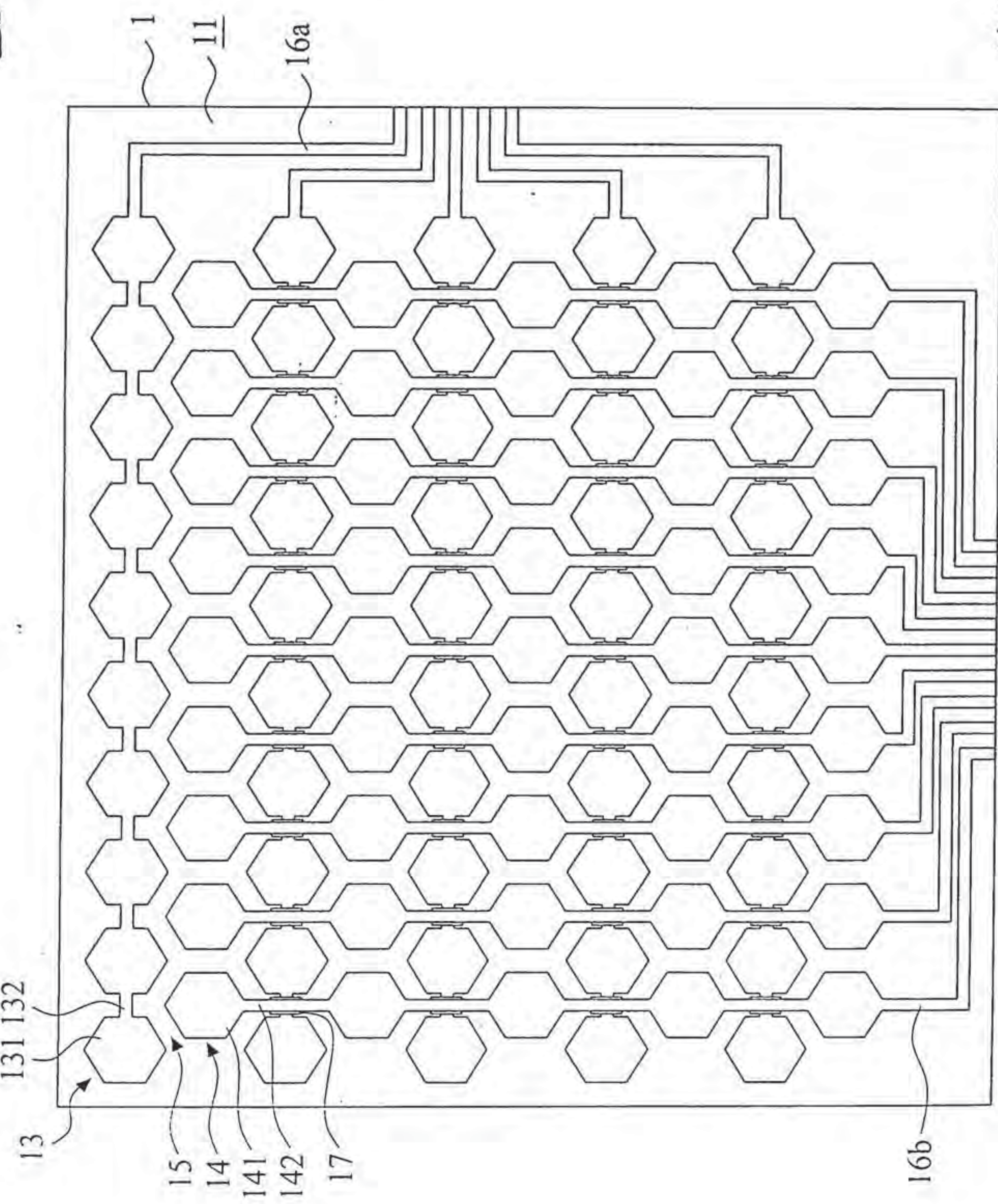
第6圖



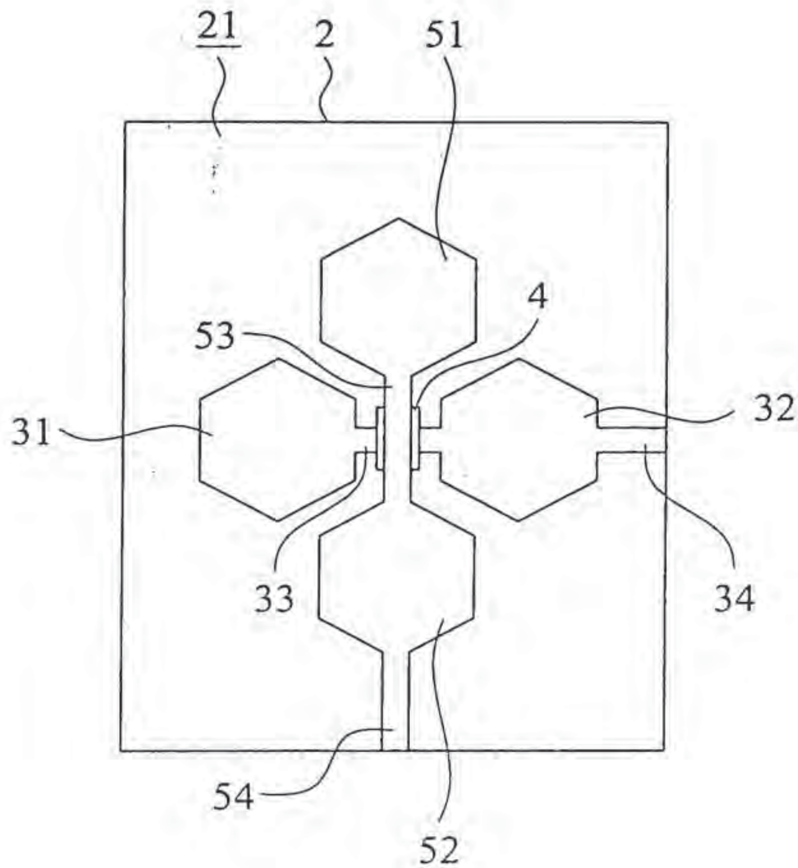
第7圖



第8圖



第9圖



第10圖

OIPE IAP51 APR 03 2008 PATENT & TRADEMARK OFFICE

IFW

PTO/SB/122 (01-06)
Approved for use through 12/31/2008. OMB 0651-0035
U.S. Patent and Trademark Office; U.S. DEPARTMENT OF COMMERCE
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CHANGE OF CORRESPONDENCE ADDRESS
Application

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

Application Number	11/842,747
Filing Date	21 AUGUST 2007
First Named Inventor	CHING-YANG CHANG
Art Unit	2629
Examiner Name	UNKNOWN
Attorney Docket Number	MR2863-351

Please change the Correspondence Address for the above-identified patent application to:

☑ The address associated with Customer Number: 04586

OR

☐ Firm or Individual Name: Rosenberg, Klein & Lee

Address: 3458 Ellicott Center Drive, Suite 101

City: Ellicott City | State: MD | Zip: 21043

Country: USA

Telephone: 410-465-6678 | Email:

This form cannot be used to change the data associated with a Customer Number. To change the data associated with an existing Customer Number use "Request for Customer Number Data Change" (PTO/SB/124).

I am the:

☐ Applicant/Inventor

☐ Assignee of record of the entire interest.
Statement under 37 CFR 3.73(b) is enclosed. (Form PTO/SB/96).

☑ Attorney or agent of record. Registration Number 26,049

☐ Registered practitioner named in the application transmittal letter in an application without an executed oath or declaration. See 37 CFR 1.33(a)(1). Registration Number ________

Signature: [signature]

Typed or Printed Name: Morton J. Rosenberg

Date: 4/3/2008 | Telephone: 410-465-6678

NOTE: Signatures of all the inventors or assignees of record of the entire interest or their representative(s) are required. Submit multiple forms if more than one signature is required, see below*.

☐ *Total of ________ forms are submitted.

This collection of information is required by 37 CFR 1.33. 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 3 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.

1FW

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Applicant : Ching-Yang Chang, Shun-Ta Chien
Serial No : 11/842,747
Filed : August 21, 2007
: Art Unit : 2629
: Examiner :
Title: : Conductor Pattern Structure of Capacitive Touch Panel

REVOCATION OF POWER OF ATTORNEY AND APPOINTMENT OF POWER OF ATTORNEY

The owner of the above-identified U.S. Patent Application, hereby revokes all Powers of Attorney previously given and hereby appoints the following Attorneys to transact all business in the U.S. Patent and Trademark Office connected therewith:

Morton J. Rosenberg, Esq., Reg. #26,049
David I. Klein, Esq., Reg. #33,253
Jun Y. Lee, Esq., Reg. #40,262

Rosenberg, Klein & Lee
3458 Ellicott Center Drive-Suite 101
Ellicott City, Maryland 21043

Send all correspondence to:

Rosenberg, Klein & Lee
3458 Ellicott Center Drive-Suite 101
Ellicott City, Maryland 21043

Direct all telephone calls to:

(410) 465-6678

Respectfully submitted,
FOR: TPK Touch Solutions Inc.

Date: 2008.3.26

Ta-Min Sun

Name : Ta-Min Sun
Title : President

Assignment made on Reel 020426 /Frame 0287

OIPE
APR 03 2008
IAP51
PATENT & TRADEMARK OFFICE

PTO/SB/96 (12-07)
Approved for use through 12/31/2007. OMB 0651-0031
U.S. Patent and Trademark Office; U.S. DEPARTMENT OF COMMERCE

STATEMENT UNDER 37 CFR 3.73(b)

Applicant/Patent Owner: Ching-Yang Chang, Shun-Ta Chien

Application No./Patent No.: 11/842,747 Filed/Issue Date: August 21, 2007

Entitled: Surface Coating Film Structure on Heat Dissipation Metal and Manufacturing Method Thereof

TPK Touch Solutions Inc., a Corporation
(Name of Assignee) (Type of Assignee, e.g., corporation, partnership, university, government agency, etc.)

states that it is:

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

2. ☐ an assignee of less than the entire right, title and interest
(The extent (by percentage) of its ownership interest is ________ %)

in the patent application/patent identified above by virtue of either:

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 020426, Frame 0287, or for which a copy thereof is attached.

OR

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.

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.

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

☐ As required by 37 CFR 3.73(b)(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.

Ta-Min Sun 2008.3.26
Signature Date

Ta-Min Sun 886-2709-8779
Printed or Typed Name Telephone Number

President
Title

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
11/842,747	08/21/2007	Ching-Yang Chang	MR2863-351

CONFIRMATION NO. 3897

POA ACCEPTANCE LETTER

OC000000029415939

4586
ROSENBERG, KLEIN & LEE
3458 ELLICOTT CENTER DRIVE-SUITE 101
ELLICOTT CITY, MD 21043

Date Mailed: 04/17/2008

NOTICE OF ACCEPTANCE OF POWER OF ATTORNEY

This is in response to the Power of Attorney filed 04/03/2008.

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.

/hchristian/

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

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
11/842,747	08/21/2007	Ching-Yang Chang	TVM-002

CONFIRMATION NO. 3897

POWER OF ATTORNEY NOTICE

3897
SCHNECK & SCHNECK
P.O. BOX 2-E
SAN JOSE, CA 95109-0005

OC000000029415858

Date Mailed: 04/17/2008

NOTICE REGARDING CHANGE OF POWER OF ATTORNEY

This is in response to the Power of Attorney filed 04/03/2008.

- 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).

/hchristian/

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

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
11/842,747	08/21/2007	Ching-Yang Chang	MR2863-351

CONFIRMATION NO. 3897

PUBLICATION NOTICE

OC000000032863665

4586
ROSENBERG, KLEIN & LEE
3458 ELLICOTT CENTER DRIVE-SUITE 101
ELLICOTT CITY, MD 21043

Title:CONDUCTOR PATTERN STRUCTURE OF CAPACITIVE TOUCH PANEL

Publication No.US-2008-0264699-A1
Publication Date:10/30/2008

NOTICE OF PUBLICATION OF APPLICATION

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

The publication may be accessed through the USPTO's publically available Searchable Databases via the Internet at www.uspto.gov. The direct link to access the publication is currently http://www.uspto.gov/patft/.

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

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

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

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

Substitute for form 1449/PTO

INFORMATION DISCLOSURE STATEMENT BY APPLICANT

(Use as many sheets as necessary)

Sheet 1 of 2

Complete if Known	
Application Number	11/842,747
Filing Date	8/21/2007
First Named Inventor	Ching-Yang Chang, et al.
Art Unit	2629
Examiner Name	R. Hjerpe
Attorney Docket Number	MR2863-351

U. S. PATENT DOCUMENTS

Examiner Initials*	Cite No.[1]	Document Number Number-Kind Code[2] *(if known)*	Publication Date MM-DD-YYYY	Name of Patentee or Applicant of Cited Document	Pages, Columns, Lines, Where Relevant Passages or Relevant Figures Appear
	A	US-6,188,391	2/13/2001	Seely, et al.	
	B	US-6,137,427	10/24/2000	Binstead	
		US-			
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		US-			

FOREIGN PATENT DOCUMENTS

Examiner Initials*	Cite No.[1]	Foreign Patent Document Country Code[3] -Number[4] -Kind Code[5] *(if known)*	Publication Date MM-DD-YYYY	Name of Patentee or Applicant of Cited Document	Pages, Columns, Lines, Where Relevant Passages Or Relevant Figures Appear	T[6]

Examiner Signature		Date Considered	

*EXAMINER: Initial if reference considered, whether or not citation is in conformance with MPEP 609. Draw line through citation if not in conformance and not considered. Include copy of this form with next communication to applicant. [1] Applicant's unique citation designation number (optional). [2] See Kinds Codes of USPTO Patent Documents at www.uspto.gov or MPEP 901.04. [3] Enter Office that issued the document, by the two-letter code (WIPO Standard ST.3). [4] For Japanese patent documents, the indication of the year of the reign of the Emperor must precede the serial number of the patent document. [5] Kind of document by the appropriate symbols as indicated on the document under WIPO Standard ST.16 if possible. [6] Applicant is to place a check mark here if English language Translation is attached.

Substitute for form 1449/PTO

INFORMATION DISCLOSURE STATEMENT BY APPLICANT

(Use as many sheets as necessary)

Complete if Known	
Application Number	11/842,747
Filing Date	8/21/2007
First Named Inventor	Ching-Yang Chang, et al.
Art Unit	2629
Examiner Name	R. Hjerpe
Attorney Docket Number	MR2863-351

Sheet 2 of 2

NON PATENT LITERATURE DOCUMENTS

Examiner Initials*	Cite No.[1]	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, page(s), volume-issue number(s), publisher, city and/or country where published.	T[2]
	AA	A Communication from the European Patent Office dated 16 September 2008 regarding the corresponding foreign patent application EP07018556.	

Examiner Signature		Date Considered	

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

1 Applicant's unique citation designation number (optional). 2 Applicant is to place a check mark here if English language Translation is attached.

JFW

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Applicant:	Ching-Yang Chang, et al.	:	
Serial No:	11/842,747	:	Art Unit # 2629
Filed:	21 August 2007	:	Examiner:
Title:	CONDUCTOR PATTERN STRUCTURE OF CAPACITIVE TOUCH PANEL	:	R. Hjerpe

INFORMATION DISCLOSURE STATEMENT

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

Sir:

The Applicants wish to make the following art references of record in the above-identified Patent Application pursuant to 37 C.F.R. §§ 1.97 and 1.98, and to the Duty of Disclosure set forth in 37 C.F.R. § 1.56

Although the information submitted herewith may be "material" to the Examiner's consideration of the subject Patent Application, this submission is not intended to constitute an admission that such information is "prior art" as to the claimed invention.

In accordance with 37 C.F.R. § 1.97(g), the filing of this Information Disclosure Statement shall not be construed to mean that a search was made or that no other material information, as defined in 37 C.F.R. § 1.56(b), exists.

I. The cited U.S. Patent references are:

Ref. No.	Patent No.	Issue Date	Inventor(s)
A	6,188,391	2/13/2001	Seely, et al.
B	6,137,427	10/24/2000	Binstead

II. The cited Non-Patent Literature reference is:

Ref. No.	Description
AA	A Communication from the European Patent Office dated 16 September 2008 regarding the corresponding foreign patent application EP07018556.

This Information Disclosure Statement is being filed more then three months subsequent to the filing date of the subject Patent Application, but before the mailing of a first Office Action.

A Form PTO/SB/08A and a Form PTO/SB/08B (Substitutes for Form 1449/PTO) are submitted along with this document. The U.S. references became known to the Applicants through a communication from a foreign Patent Office. It is requested that the Examiner consider the cited references and make them of record in the above-referenced Patent Application.

Respectfully submitted,
FOR: ROSENBERG, KLEIN & LEE

Morton J. Rosenberg

Morton J. Rosenberg
Registration No. 26,049

Dated: 11/18/08

Suite 101
3458 Ellicott Center Drive
Ellicott City, MD 21043
(410) 465-6678
Customer No. 04586

ISW

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Applicant:	Ching-Yang Chang, et al.	:	
Serial No:	11/842,747	:	Art Unit # 2629
Filed:	21 August 2007	:	Examiner:
Title:	CONDUCTOR PATTERN STRUCTURE OF CAPACITIVE TOUCH PANEL	:	R. Hjerpe

OIPE IAP38 JAN 06 2009 PATENT & TRADEMARK OFFICE

SUPPLEMENTAL INFORMATION DISCLOSURE STATEMENT

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

Sir:

The Applicants wish to make the following art references of record in the above-identified Patent Application pursuant to 37 C.F.R. §§ 1.97 and 1.98, and to the Duty of Disclosure set forth in 37 C.F.R. § 1.56

Although the information submitted herewith may be "material" to the Examiner's consideration of the subject Patent Application, this submission is not intended to constitute an admission that such information is "prior art" as to the claimed invention.

In accordance with 37 C.F.R. § 1.97(g), the filing of this Information Disclosure Statement shall not be construed to mean that a search was made or that no other material information, as defined in 37 C.F.R. § 1.56(b), exists.

The cited U.S. Patent references are:

Ref. No.	Patent/Publ. No.	Issue Date	Inventor(s)
C	2006/0066581	3/30/2006	Lyon, et al.
D	6,970,160	11/29/2005	Mulligan, et al.
E	4,550,221	10/29/1985	Mabusth

This Information Disclosure Statement is being filed more then three months subsequent to the filing date of the subject Patent Application, but before the mailing of a first Office Action.

A Form PTO/SB/08A (Substitute for Form 1449/PTO) is submitted along with this document. It is requested that the Examiner consider the cited references and make them of record in the above-referenced Patent Application.

Respectfully submitted,
FOR: ROSENBERG, KLEIN & LEE

Morton J. Rosenberg

Morton J. Rosenberg
Registration No. 26,049

Dated: 1/5/2009

Suite 101
3458 Ellicott Center Drive
Ellicott City, MD 21043
(410) 465-6678
Customer No. 04586

OIPE IAP38
JAN 06 2009
PATENT & TRADEMARK OFFICE

PTO/SB/08A (08-03)
Approved for use through 07/31/2006. OMB 0651-0031
U.S. Patent and Trademark Office; U.S. DEPARTMENT OF COMMERCE
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Substitute for form 1449/PTO

INFORMATION DISCLOSURE STATEMENT BY APPLICANT

(Use as many sheets as necessary)

Sheet 1 of 1

Complete if Known	
Application Number	11/842,747
Filing Date	8/21/2007
First Named Inventor	Ching-Yang Chang, et al.
Art Unit	2629
Examiner Name	R. Hjerpe
Attorney Docket Number	MR2863-351

U. S. PATENT DOCUMENTS

Examiner Initials*	Cite No.[1]	Document Number Number-Kind Code[2] *(if known)*	Publication Date MM-DD-YYYY	Name of Patentee or Applicant of Cited Document	Pages, Columns, Lines, Where Relevant Passages or Relevant Figures Appear
	C	US- 2006/0066581	3/30/2006	Lyon, et al.	
	D	US- 6,970,160	11/29/2005	Mulligan, et al.	
	E	US- 4,550,221	10/29/1984	Mabusth	
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FOREIGN PATENT DOCUMENTS

Examiner Initials*	Cite No.[1]	Foreign Patent Document Country Code[3] -Number[4] -Kind Code[5] *(if known)*	Publication Date MM-DD-YYYY	Name of Patentee or Applicant of Cited Document	Pages, Columns, Lines, Where Relevant Passages Or Relevant Figures Appear	T[6]

Examiner Signature		Date Considered	

*EXAMINER: Initial if reference considered, whether or not citation is in conformance with MPEP 609. Draw line through citation if not in conformance and not considered. Include copy of this form with next communication to applicant. [1]Applicant's unique citation designation number (optional). [2]See Kinds Codes of USPTO Patent Documents at www.uspto.gov or MPEP 901.04. [3]Enter Office that issued the document, by the two-letter code (WIPO Standard ST.3). [4]For Japanese patent documents, the indication of the year of the reign of the Emperor must precede the serial number of the patent document. [5]Kind of document by the appropriate symbols as indicated on the document under WIPO Standard ST.16 if possible. [6]Applicant is to place a check mark here if English language Translation is attached.

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 2 hours 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, 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 (1-800-786-9199) and select option 2.

MR2863-351

2009 JAN 23 PM 5: 14

OIPE IAP91
JAN 21 2009
PATENT & TRADEMARK OFFICE

IFW

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

RECEIVED
JAN 30 2009
OFFICE OF PETITIONS

Inventor : Ching-Yang Chang, et al. :

Serial No. : 11/842,747 : Art Unit #2629

Filed : 21 August 2007 : Examiner: Unknown

Title : CONDUCTOR PATTERN STRUCTURE OF CAPACITIVE TOUCH PANEL

REQUEST FOR CHANGE OF ENTITY STATUS
TO LARGE ENTITY

Mail Stop FEE
Honorable Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

Sir:

Applicant, by the undersigned attorney hereby requests that the entity status of the above-referenced patent application be changed to a "large entity". The patent application was inadvertently filed claiming "small entity" status. The owner of the above-referenced patent application is a foreign corporation and was not knowledgeable of USPTO Rules and Regulations regarding "small entity" and "large entity" ownership.

Attached to this Request for Change of Entity Status is a check in the amount of $665.00 for the additional filing fee required for a large entity utility patent application.

It is requested that the U.S. Patent and Trademark Office amend its records to show the fact that the patent application status has been changed.

01/27/2009 DALLEN 00000021 11842747
01 FC:1461 665.00 OP

Respectfully submitted,
FOR: ROSENBERG, KLEIN & LEE

Morton J. Rosenberg
Registration No. 26,049

Dated: 20 Jan 2009

Suite 101
3458 Ellicott Center Drive
Ellicott City, MD 21043
Tel: 410-465-6678
Customer No. 04586

IFW

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Applicant:	Ching-Yang Chang, et al.	:	
Serial No:	11/842,747	:	Art Unit # 2629
Filed:	21 August 2007	:	Examiner:
Title:	CONDUCTOR PATTERN STRUCTURE OF CAPACITIVE TOUCH PANEL	:	R. Hjerpe

SUPPLEMENTAL INFORMATION DISCLOSURE STATEMENT

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

Sir:

The Applicants wish to make the following art references of record in the above-identified Patent Application pursuant to 37 C.F.R. §§ 1.97 and 1.98, and to the Duty of Disclosure set forth in 37 C.F.R. § 1.56

Although the information submitted herewith may be "material" to the Examiner's consideration of the subject Patent Application, this submission is not intended to constitute an admission that such information is "prior art" as to the claimed invention.

In accordance with 37 C.F.R. § 1.97(g), the filing of this Information Disclosure Statement shall not be construed to mean that a search was made or that no other material information, as defined in 37 C.F.R. § 1.56(b), exists.

The cited U.S. Patent references are:

Ref. No.	Patent/Publ. No.	Issue Date	Inventor(s)
F	7,292,229	11/6/2007	Morag, et al.
G	6,005,555	12/21/1999	Katsurahira, et al.
H	5,381,160	1/10/1995	Landmeier

This Information Disclosure Statement is being filed more then three months subsequent to the filing date of the subject Patent Application, but before the mailing of a first Office Action.

A Form PTO/SB/08A (Substitute for Form 1449/PTO) is submitted along with this document. It is requested that the Examiner consider the cited references and make them of record in the above-referenced Patent Application.

Respectfully submitted,
FOR: ROSENBERG, KLEIN & LEE

Morton J. Rosenberg

Morton J. Rosenberg
Registration No. 26,049

Dated: 1/30/09

Suite 101
3458 Ellicott Center Drive
Ellicott City, MD 21043
(410) 465-6678
Customer No. 04586

FEB 04 2009

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PTO/SB/08A (08-03)
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Substitute for form 1449/PTO

INFORMATION DISCLOSURE STATEMENT BY APPLICANT

(Use as many sheets as necessary)

Sheet 1 of 1

Complete if Known	
Application Number	11/842,747
Filing Date	8/21/2007
First Named Inventor	Ching-Yang Chang, et al.
Art Unit	2629
Examiner Name	R. Hjerpe
Attorney Docket Number	MR2863-351

U. S. PATENT DOCUMENTS

Examiner Initials*	Cite No.[1]	Document Number Number-Kind Code[2] *(if known)*	Publication Date MM-DD-YYYY	Name of Patentee or Applicant of Cited Document	Pages, Columns, Lines, Where Relevant Passages or Relevant Figures Appear
	F	US-7,292,229	11/6/2007	Morag, et al.	
	G	US-6,005,555	12/21/1999	Katsurahira, et al.	
	H	US-5,381,160	1/10/1995	Landmeier	
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FOREIGN PATENT DOCUMENTS

Examiner Initials*	Cite No.[1]	Foreign Patent Document Country Code[3] -Number[4] -Kind Code[5] *(if known)*	Publication Date MM-DD-YYYY	Name of Patentee or Applicant of Cited Document	Pages, Columns, Lines, Where Relevant Passages Or Relevant Figures Appear	T[6]

Examiner Signature		Date Considered	

*EXAMINER: Initial if reference considered, whether or not citation is in conformance with MPEP 609. Draw line through citation if not in conformance and not considered. Include copy of this form with next communication to applicant. [1] Applicant's unique citation designation number (optional). [2] See Kinds Codes of USPTO Patent Documents at www.uspto.gov or MPEP 901.04. [3] Enter Office that issued the document, by the two-letter code (WIPO Standard ST.3). [4] For Japanese patent documents, the indication of the year of the reign of the Emperor must precede the serial number of the patent document. [5] Kind of document by the appropriate symbols as indicated on the document under WIPO Standard ST.16 if possible. [6] Applicant is to place a check mark here if English language Translation is attached.

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 2 hours 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, P.O. Box 1450, Alexandria, VA 22313-1450. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. **SEND TO: Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450.**

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ORRICK

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 CFR 3.73 (b).

I hereby appoint:

☒ Practitioners associated with Customer Number: **34313**

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 CFR 1.73(b).

I hereby authorize the U.S. attorneys and/or agents named hereinabove to accept and follow instructions from TPK TOUCH SOLUTIONS INC. as to any action to be taken in the U.S. Patent and Trademark Office regarding this application without direct communication between the U.S. attorneys and/or agents and me. In the event of a change in the person(s) from whom instructions may be taken I will so notify the U.S. attorneys and/or agents named herein.

Please change the correspondence address for the application identified in the attached statement under 37 CFR 3.73(b) to:

☒ The address associated with Customer Number: **34313**

Assignee Name and Address:
TPK TOUCH SOLUTIONS INC.
14F., NO. 136, SEC.3, REN-AI RD. DA-AN DISTRICT, TAIPEI CITY, TAIWAN 106

A copy of this form, together with a statement under 37 CFR 3.73(b) (Form PTO/SB/96 or equivalent) is required to be filed in each application in which this form is used. The statement under 37 CFR 3.73(b) may be completed by one of the practitioners appointed in this form if the appointed practitioner is authorized to act on behalf of the assignee, and must identify the application in which this Power of Attorney is to be filed. The undersigned hereby authorizes and empowers the registered practitioners associated with Customer Number 34313 to sign statements under 37 CFR 3.73(b) on behalf of the undersigned.

SIGNATURE of Assignee of Record

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

Signature	Sun Ta-Min	Date	2009. 6. 18.
Name	Sun, Ta-Min	Telephone	86-592-573-8999
Title	President		

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Appl. No.	:	11/842747	Confirmation No.:	3897
Applicant	:	Chang et al.		
Filing Date	:	08/21/2007		
Title	:	Conductor Pattern Structure of Capacitive Touch Panel		
Group Art Unit	:			
Examiner	:			
Docket No.	:	22271.4002		
Customer No.	:	34313		

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

CHANGE OF CORRESPONDENCE ADDRESS

Sir:

Please change the Correspondence Address for the above-identified application to:

ORRICK, HERRINGTON & SUTCLIFFE, LLP
4 Park Plaza, Suite 1600
Irvine, CA 92614-2558
Telephone: (949) 567-6700
Facsimile: (949) 567-6710
Attn: Robert M. Isackson

Customer Number: 34313

I am the:

☐ Applicant.

☐ Assignee of record of the entire interest.
Certificate under 37 CFR 3.73(b) is enclosed.

☒ Attorney or agent of record. Registration No. 31110.

Respectfully submitted,
ORRICK, HERRINGTON & SUTCLIFFE LLP

Dated: 29 Jun 2009

By:
Robert M. Isackson
Reg. No. 31110

ORRICK, HERRINGTON & SUTCLIFFE, LLP
4 Park Plaza, Suite 1600
Irvine, CA 92614-2558

OHS West:260686222.1

STATEMENT UNDER 37 CFR 3.73(b)

Applicant/Patent Owner	Chang et al.		
Application No./ Patent No.	11/842747	Filed/Issue Date	08/21/2007
Entitled	Conductor Pattern Structure of Capacitive Touch Panel		
Name of Assignee	TPK Touch Solutions Inc.		
Type of Assignee (corporation, partnership, university)	Corporation		

states that it is:

1 ☒ the assignee of the entire right, title and interest; or

2 ☐ an assignee of less than the entire right, title and interest.
The extent (by percentage) of its ownership interest is ___________%

in the patent application/patent identified above by virtue of either:

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 a true copy of the original assignment is attached.

or

B. ☒ A chain of title from the inventors(s), of the patent application/patent identified above, to the current assignee as shown below:

1. From: Chang et al. To: Trendon Touch Technology Corp.
The document was recorded in the United Sates Patent and Trademark Office at Reel 020326 , Frame 0259, or for which a copy thereof is attached
2. From: Trendon Touch Technology Corp. To: TPK Touch Solutions Inc.
The document was recorded in the United Sates Patent and Trademark Office at Reel 020426 , Frame 0287, or for which a copy thereof is attached
3. From:_______________ To:_______________
The document was recorded in the United Sates 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.

☐ Copies of assignments or other documents in the chain of title are attached.

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

Signature	[signature]		
Date	29 June 2009	Typed Name	Robert M. Isackson
Telephone	212 5?? 5280	Title	Attorney, Reg. 31110

OHS West:260686218.1

Electronic Acknowledgement Receipt

EFS ID:	5615308
Application Number:	11842747
International Application Number:	
Confirmation Number:	3897
Title of Invention:	CONDUCTOR PATTERN STRUCTURE OF CAPACITIVE TOUCH PANEL
First Named Inventor/Applicant Name:	Ching-Yang Chang
Customer Number:	04586
Filer:	Donald Erik Daybell/Angela Wendel
Filer Authorized By:	Donald Erik Daybell
Attorney Docket Number:	MR2863-351
Receipt Date:	30-JUN-2009
Filing Date:	21-AUG-2007
Time Stamp:	14:45:31
Application Type:	Utility under 35 USC 111(a)

Payment information:

Submitted with Payment	no

File Listing:

Document Number	Document Description	File Name	File Size(Bytes)/ Message Digest	Multi Part /.zip	Pages (if appl.)
1	Power of Attorney	power_of_attorney.pdf	64727 f8be8a5c041d3f19536b9797123f9768102fedfb	no	1

Warnings:

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Information:

2		change_correspondence.pdf	66830 8644fc9bc3c4429976cc9768be3ff421b92893ae	yes	2

Multipart Description/PDF files in .zip description

Document Description	Start	End
Change of Address	1	1
Assignee showing of ownership per 37 CFR 3.73(b).	2	2

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Information:

Total Files Size (in bytes):	131557

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New Applications Under 35 U.S.C. 111
If a new application is being filed and the application includes the necessary components for a filing date (see 37 CFR 1.53(b)-(d) and MPEP 506), a Filing Receipt (37 CFR 1.54) will be issued in due course and the date shown on this Acknowledgement Receipt will establish the filing date of the application.

National Stage of an International Application under 35 U.S.C. 371
If a timely submission to enter the national stage of an international application is compliant with the conditions of 35 U.S.C. 371 and other applicable requirements a Form PCT/DO/EO/903 indicating acceptance of the application as a national stage submission under 35 U.S.C. 371 will be issued in addition to the Filing Receipt, in due course.

New International Application Filed with the USPTO as a Receiving Office
If a new international application is being filed and the international application includes the necessary components for an international filing date (see PCT Article 11 and MPEP 1810), a Notification of the International Application Number and of the International Filing Date (Form PCT/RO/105) will be issued in due course, subject to prescriptions concerning national security, and the date shown on this Acknowledgement Receipt will establish the international filing date of the application.

UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
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www.uspto.gov

APPLICATION NUMBER	FILING OR 371(C) DATE	FIRST NAMED APPLICANT	ATTY. DOCKET NO./TITLE
11/842,747	08/21/2007	Ching-Yang Chang	22271.4002

CONFIRMATION NO. 3897

POA ACCEPTANCE LETTER

OC000000036751656

34313
ORRICK, HERRINGTON & SUTCLIFFE, LLP
IP PROSECUTION DEPARTMENT
4 PARK PLAZA
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IRVINE, CA 92614-2558

Date Mailed: 07/07/2009

NOTICE OF ACCEPTANCE OF POWER OF ATTORNEY

This is in response to the Power of Attorney filed 06/30/2009.

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.

/tha/

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

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www.uspto.gov

APPLICATION NUMBER	FILING OR 371(C) DATE	FIRST NAMED APPLICANT	ATTY. DOCKET NO./TITLE
11/842,747	08/21/2007	Ching-Yang Chang	MR2863-351

CONFIRMATION NO. 3897

POWER OF ATTORNEY NOTICE

4586
ROSENBERG, KLEIN & LEE
3458 ELLICOTT CENTER DRIVE-SUITE 101
ELLICOTT CITY, MD 21043

OC000000036751613

Date Mailed: 07/07/2009

NOTICE REGARDING CHANGE OF POWER OF ATTORNEY

This is in response to the Power of Attorney filed 06/30/2009.

- 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).

/tha/

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

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Similar to PTO/SB/08a
Substitute for form 1449A/PTO

INFORMATION DISCLOSURE STATEMENT BY APPLICANT (use as many sheets as necessary)				Complete if Known	
				Application Number	11/842,747
				Filing Date	August 21, 2007
				First Named Inventor	Ching-Yang Chang
				Art Unit	2629
				Examiner Name	Not Yet Assigned
Sheet	1	of	1	Attorney Docket Number	22271-4002
				Confirmation No.	3897

U.S. PATENT DOCUMENTS

Examiner Initials	Cite No.[1]	U.S. Patent Document Number	Kind Code[2]	Name of Patentee or Applicant of Cited Document	Date of Publications of Cited Documents MM-DD-YYYY	Pages, Columns, Lines, Where Relevant Passages or Figures Appear
	1	US2005/0030048	A1	Bolender	02/10/2005	
	2	US2009/0160682	A1	Bolender	06/25/2009	
	3	6,970,160	B2	Mulligan	11/29,2005	
	4	6,137,427		Binstead	10/24/2000	

FOREIGN PATENT DOCUMENTS

Examiner Initials	Cite No.[1]	Foreign Patent Document Office[3]	Number[4]	Kind Code[5]	Name of Patentee or Applicant of Cited Document	Date of Publications of Cited Documents MM-DD-YYYY	Pages, Columns, Lines, Where Relevant Passages or Figures Appear	English Abstract T[6]
			JP 60-075927			4/30/1985		yes

OTHER PRIOR ART - NON PATENT LITERATURE DOCUMENTS

Examiner Initials	Cite No.[1]	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, page(s), volume-issue number(s), publisher, city and/or country where published.	T[2]
	CA	Korean Office Action; issue date, May 18, 2009 for SN 10-2007-0133201	
	CB	EP Office Action dated 01-01-2009; SN 07018556.6	
	CC	File Wrapper for U.S. Patent Application Serial No. 10/279,828	

Examiner Signature	OHS West:260819279.1 22271-4002 RHH/RHH	Date Considered	

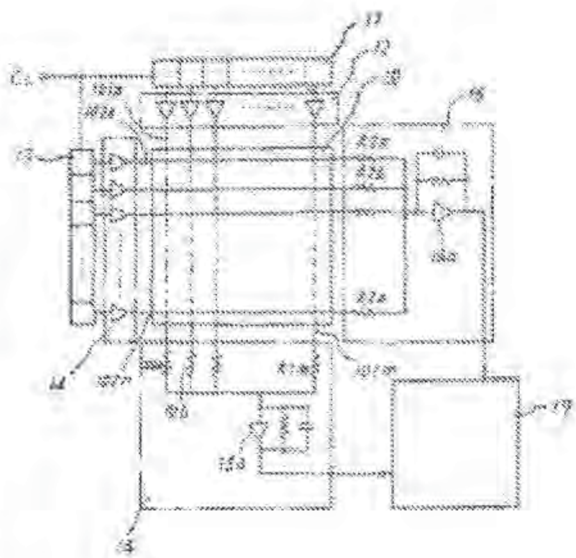
*EXAMINER: Initial if reference considered, whether or not citation is in conformance with MPEP 609. Draw line through citation if not in conformance and not considered. Include copy of this form with next communication to applicant. [1]Applicants unique citation designation number (optional). [2]See Kinds of U.S. Patent Documents at www.uspto.gov or MPEP 901.04. [3]Enter Office that issued the document, by the two-letter code (WIPO Standard ST.3). [4]For Japanese patent documents, the indication of the year of the reign of the Emperor must precede the serial number of the patent document. [5]Kind of document by the appropriate symbols as indicated on the document under WIPO Standard ST. 16 if possible. [6]Applicant is to place a check mark here if English language Translation is attached.

COORDINATE INPUT DEVICE

Publication number: JP60075927 (A)
Publication date: 1985-04-30
Inventor(s): KURITA SHIYOUICHI +
Applicant(s): FUJITSU LTD +
Classification:
- international: *G06F3/041; G06F3/03; G06K11/06;* **G06F3/041; G06F3/03; G06K11/06;** (IPC1-7): G06F3/03; G06K11/06
- European:
Application number: JP19830184013 19830930
Priority number(s): JP19830184013 19830930

Abstract of **JP 60075927 (A)**

PURPOSE:To improve both the stability of detection and the image resolution by detecting the position of coordinates after scanning plural transparent conductor lines of a sensor panel and detecting the change of the output addition level.
CONSTITUTION:A sensor panel 10 is formed with X and Y transparent conductor lines 101 (101a-101m) and 102 (102a-102n) insulating and crossing to each other on a transparent substrate. Scanning circuits 11 and 13 consisting of shift registers and drive circuits 12 and 14 are provided at one side of both lines 101 and 102, respectively. Then the scanning is successively carried out with a clock pulse CL. While addition circuits 15 and 16 are set at the other side of the lines 101 and 102, respectively. The outputs of the circuits 15 and 16 are delivered to a position detecting circuit 17 for detection of the position of coordinates. In this case, the electrostatic capacity is applied to the conductor line at a position on the panel 10 where a finger, etc. has a touch. The applied drive signal is applied to the circuit 15 via each addition resistance to obtain X and Y coordinates of an intersecting point.



⑲日本国特許庁（JP）　　⑪特許出願公開

⑫公開特許公報（A）　　昭60-75927

⑤Int.Cl.⁴	識別記号	庁内整理番号	㊸公開　昭和60年(1985) 4月30日
G 06 F 3/03 G 06 K 11/06		7060-5B	

審査請求　未請求　発明の数 1　（全10頁）

㊴発明の名称　座標入力装置

㉑特　　願　昭58-184013

㉒出　　願　昭58(1983) 9月30日

⑫発明者　栗田　正一　川崎市中原区上小田中1015番地　富士通株式会社内

⑪出願人　富士通株式会社　川崎市中原区上小田中1015番地

⑭代理人　弁理士 山谷 晧榮

明　細　書

1．発明の名称　座標入力装置

2．特許請求の範囲

（1）基板上に複数のX側透明導電線路と複数のY側透明導電線路とを互いに絶縁して配設したセンサパネルと、該複数のX側透明導電線路を順次駆動走査するX側ドライブ回路と、該複数のY側透明導電線路を順次駆動走査するY側ドライブ回路と、該複数のX側透明導電線路の出力を加算するX側加算回路と、該複数のY側透明導電線路の出力を加算するY側加算回路と、該X側及びY側加算回路の出力レベル変化を検出し、該出力レベル変化の生じた時間位置により指示された座標位置を検出する位置検出回路とを有し、該センサパネルの所定位置を指示した時に生じる静電容量変化によって該出力レベル変化を生ぜしめて指示された座標位置を検出することを特徴とする座標入力装置。

（2）前記センサパネルの前記X側透明導電線路と前記Y側透明導電線路とが、互いに交叉する位置の面積を他の面積より小に構成したことを特徴とする特許請求の範囲第（1）項記載の座標入力装置。

（3）前記位置検出回路は、前記出力レベル変化を検出するために、前記透明導電線路の駆動走査に同期して前記加算回路の出力を遅延せしめ、遅延させた出力と該加算回路の出力との差分をとる様に構成したことを特徴とする特許請求の範囲第（1）項乃至第（2）項記載の座標入力装置。

（4）前記位置検出回路は、前記出力レベル変化を検出するために、前記センサパネルの所定位置を指示しない状態の出力レベルを記憶し、前記加算回路の出力レベルと該記憶した出力レベルとの相対比較を行うことを特徴とする特許請求の範囲第（1）項乃至第（2）項記載の座標入力装置。

3．発明の詳細な説明

〔発明の技術分野〕

本発明は、静電容量変化を利用して指定された座標位置を検出する座標入力装置に関し、特にディスプレイ装置の画面前面に設けられ、ディスプレイ装置に入力機能を付与するに好適な座標入力装置に関する。

〔技術の背景〕

近年のオフィスオートメーション（OA）の進展に伴い、各種の端末装置が盛んに利用されている。特にディスプレイ装置は人間の視覚に訴え直観的な理解がし易いため、コンピュータと人間との有力なマンマシンインターフェイスとして、パーソナルコンピュータ、ワードプロセッサ、オンライン端末等各種用途に使用されている。この様なディスプレイ装置は一般には出力装置として用いられているが、キーボードに代わる入力装置としても使われ、更に入出力装置を兼用させる場合もある。

〔従来技術と問題点〕

ディスプレイを入力手段として用いるには、従来ライトペン方式が主流を占めていた。即ち、ブラウン管ディスプレイの電子ビームがライトペン位置のブラウン管表面の蛍光体を発光させた時に、ライトペンがこの光を検知し、その時間位置からライトペンのさした画面上の位置を検出するものである。コンピュータはこれにより、ライトペンがディスプレイ上のどの表示内容を指したかを検出し、入力内容を判別する。しかし、係るライトペン方式はブラウン管ディスプレイの様な走査形ディスプレイにしか用いることができず、又特別なライトペンという道具を用いるので人間にとって異和感があった。このため、近年特別の座標入力装置をディスプレイ画面上に設けたタッチセンサ式ディスプレイが用いられている。係る従来の座標入力装置として第1図に示す光ビームマトリックス方式のものがある。これを説明すると、ディスプレイ面5の左方にn個の発光源DY1、DY2…DYnから成るY側発光部1を配置し、一方、ディスプレイ面5の右方にはこれに対応する様にn個の受光器RY1、RY2…RYnから成るY側受光部4を配置し、同様にディスプレイ面5の上方にm個の発光源DX1、DX2…DXmから成るX側発光部2を配置し、ディスプレイ面5の下方にこれに対抗する様にm個の受光器RX1、RX2…RXmから成るX側受光部3を配置して構成する。そして発光源DX1、DX2…DXm、DY1、DY2…DYnを夫々時間的に順次駆動し、可視光域外の例えば赤外光ビームを発し、各発光源に対向して配置された受光器によって受光せしめる。この状態で人間が指で例えばディスプレイ面5上のP点を指すと、発光源DX3、DY3から光ビームは受光器RX3、RY3に到達しなくなり、これによるレベル変化を指示位置検出器6が検出し、このレベル変化の生じた時間位置から指で指されたディスプレイ面5上の座標位置を検出する。

この従来の光ビームマトリックス方式の座標入力装置は、原理的には簡単であるが、比較的大きな発光源及び受光器を多数必要とすることから装置自体が大きくなり、しかも集積化しにくいためディスプレイ装置が、突き出した感じを与え好ましくないという問題がある他に人の指でなく細い棒で指示し分解能を向上させようとしても、光ビームは広がるため隣接間の漏話が問題となり不可能であるという問題もあった。

〔発明の目的〕

本発明の目的は、装置自体をコンパクト化でき しかも高い分解能を得ることができる座標入力装置を提供するにある。

〔発明の構成〕

本発明では、上述の目的の達成のため、基板上に複数のX側透明導電線路と複数のY側透明導電線路とを互いに絶縁して配置したセンサパネルと、該複数のX側透明導電線路を順次駆動走査するX側ドライブ回路と、該複数のY側透明導電線路を順次駆動走査するY側ドライブ回路と、該複数のX側透明導電線路の出力を加算するX側加算回路と、該複数のY側透明導電線路の出力を加算するY側加算回路と、該X側及びY側加算回路の出力レベル変化を検出し、該出力レベル変化の生じた時間位置により指示された座標位置を検出する位

置検出回路とを有し、該センサパネルの所定位置を指示した時に生じる静電容量変化によって該出力レベル変化を生ぜしめて指示された座標位置を検出することを特徴としている。

また、本発明の一実施態様によれば、前記センサパネルの、前記Ｘ側透明導電線路と前記Ｙ側透明導電線路とが、互いに交叉する位置の面積を他の面積より小と形成したことを特徴としている。

更に本発明の他の実施態様によれば、前記位置検出回路は、前記出力レベル変化を検出するために、前記透明導電線路の駆動走査に同期して前記加算回路の出力を遅延せしめ、遅延させた出力と該加算回路の出力との差分をとる様に構成したことを特徴とし、本発明の別の実施態様によれば、前記位置検出回路は、前記出力レベル変化を検出するために、前記センサパネルの所定位置を指示しない状態の出力レベルを記憶し、前記加算回路の出力レベルと該記憶した出力レベルとの相対比較を行うことを特徴としている。

〔発明の実施例〕

以下、本発明を実施例により詳細に説明する。

第２図は本発明の一実施例全体構成図であり、図中、１０はセンサパネルであり、第３図のセンサパネル断面図に示す様にガラス等の透明基板１００上にｍ本のＸ側透明導電線路（以下Ｘ電極と称す）１０１ａ～１０１ｍが互いに平行に配設され、更にＸ電極群１０１ａ～１０１ｍと交叉する様にｎ本のＹ側透明導電線路（以下Ｙ電極と称す）１０２ａ～１０２ｎが互いに平行に配設されている。Ｘ電極群１０１ａ～１０１ｍとＹ電極群１０２ａ～１０２ｎとは互いに絶縁されて設けられている。このセンサパネル１０は第３図に示す如くディスプレイ２０の画面前面に装着されるが、前述の透明基板１００を取り除き、ディスプレイの画面（例えばブラウン管面）に直接Ｘ電極群及びＹ電極群を設けてセンサパネル１０とディスプレイを一体化してもよい。１１はＸ側走査回路であり、シフトレジスタで構成され、クロックパルスＣＬに応じてＸ電極群１０１ａ～　１０１ｍを順次走査するもの、１２はＸ側ドライブ回路であり、Ｘ側走査回路１１の走査に応じてＸ電極群に電圧を付与して駆動するもの、１３はＹ側走査回路であり、シフトレジスタで構成され、クロックパルスＣＬに応じてＹ電極群１０２ａ～１０２ｎを順次走査するもの、１４はＹ側ドライブ回路であり、Ｙ側走査回路１３の走査に応じてＹ電極群に電圧を付与して駆動するものであり、これらＸ及びＹ側走査回路１１、１３およびＸ、Ｙ側ドライブ回路１２、１４によってドライブ回路を構成する。１５はＸ側加算回路であり、各Ｘ電極１０１ａ～１０１ｍに接続される加算抵抗　Ｒ１ａ～Ｒ１ｍと、これら加算抵抗Ｒ１ａ～Ｒ１ｍの出力を加算するオペアンプ１５ａとで構成されるもの、１６はＹ側加算回路であり、各Ｙ電極１０２ａ～１０２ｎに接続される加算抵抗Ｒ２ａ～Ｒ２ｎと、これら加算抵抗Ｒ２ａ～Ｒ２ｎの出力を加算するオペアンプ１６ａとで構成される。１７は位置検出回路であり、Ｘ及びＹ側加算回路１５、１６の出力から指示された座標位置を検出するものである。

次に第２図実施例構成の動作について第４図の各部波形図に基いて説明する。

クロックパルスＣＬがＸ及びＹ側走査回路１１、１３に入力されると、Ｘ側ドライブ回路１２から各Ｘ電極１０１ａ～１０１ｍに各々駆動信号Ｘ１、Ｘ２～Ｘｍが順次印加され、同様にＹ側ドライブ回路１４から各Ｙ電極　１０２ａ～１０２ｎに各々駆動信号Ｙ１、Ｙ２…Ｙｍが順次印加される。

センサパネル１０に指等が触られていない状態ではＸ側加算回路１５の出力Ｘ０は、オペアンプ１５ａがインバータとして働くため、実線の如く、駆動信号Ｘ１、Ｘ２…Ｘｍの単純和の反転極性をもつ－Ｖで一定しており、同様にＹ側加算回路１６の出力Ｙ０も実線の如く、駆動信号Ｙ１、Ｙ２…Ｙｎの単純和の反転極性をもつ－Ｖで一定している。

この状態で人の指等がセンサパネル１０の所望の位置に触れると、その位置のＸ電極（例えば１０１ｋ）とＹ電極（例えば１０２ｌ）に指等が触れ、人体の持つ静電容量が付与される。このため、

Ｘ電極１０１ｋ及びＹ電極１０２ℓに印加された駆動信号Ｘｋ、Ｙℓは波形の立上りがなまった形で各加算抵抗Ｒ１ｋ、Ｒ２ℓに伝えられる。このため、加算回路１５の出力ＸＯはＸ電極１０１ｋの走査に対応する時間位置ｔｘｏにおいて点線で示す如く波形歪ｐｘｏが生じ、同様に加算回路１６の出力ＹＯはＹ電極１０２ℓの走査に対応する時間位置ｔｙｏにおいて点線で示す如く波形歪ｐｙｏを生ずる。位置検出回路１７は出力ＸＯ、ＹＯを所定のスライスレベルでスライスし、歪信号ｐｘｏ、ｐｙｏを取り出し、この歪信号ｐｘｏ、ｐｙｏが走査開始時点ｔｓからどの時間位置ｔｘｏ、ｔｙｏにあるかを計数し、これによって触れられた電極１０１ｋ、１０２ℓの交点のＸ座標及びＹ座標を得る。従って、歪信号ｐｘｏ、ｐｙｏの時間位置ｔｘｏ、ｔｙｏを測定することによってセンサパネル１０上の指定位置を検出することができる。

第５図は第２図構成のセンサパネル１０の詳細図であり、第５図（Ａ）に示す如く透明基板１００上にＸ電極１０１とＹ電極１０２とが透明導電膜（例えばSnO_2、In_2O_3）が１０００Åオーダのスパッタ等の方法によって形成される。第５図（Ｂ）の部分詳細図に示す如く、Ｘ電極１０１とＹ電極１０２との交叉位置においては、Ｘ電極１０１とＹ電極１０２との間にSiO_2等から成る透明絶縁膜１０３が１０００Åオーダのスパッタ等の方法で形成される。これらの導電膜１０１、１０２及び絶縁膜１０３は基板１００上に順次スパッタ等の方法で作成される。一方、基板１００の裏面には必要に応じシールド・アースを兼ねた透明導体薄膜１０４がSnO_2、In_2O_3などの透明導電膜によって一面に形成される。

第６図は第２図構成のセンサパネル１０の等価回路図である。ここでＸ電極１０１ａ～１０１ｍについて考えてみると、Ｘ電極１０１ａ～１０１ｍのアースとの間の静電容量をＣｇ、Ｘ電極とＹ電極との間の静電結合容量をＣｋ、各Ｘ電極１０１ａ～１０１ｍの線路抵抗ｒとそれに接続される加算抵抗Ｒの和をＲ'とすると、第６図の如く等価回路図となる。尚Ｘとは駆動波形発生源を示す。

ここで、基板１００のガラス板厚を１ｍｍ、Ｘ、Ｙ電極、絶縁膜１０３の膜厚を１０００Å、電極線巾を１ｍｍ、線路長を２０ｃｍとすると、Ｃｇ≈７ＰＦ、Ｃｋ≈３５０ＰＦ、ｒ≈１２ＫΩとなる。各電極に供給される駆動信号（パルス）は同期性を持つが、人が指でさわる時の接触時間に対して十分短い周期である必要があり、この周期１ｍｓｅｃとする。ここで各電極の数ｍ＝ｎ＝３００とすると、１つの電極を駆動している時間巾は３μｓｅｃとなる。
一方、前述の値よりＣｋ・ｒ＝４．２μｓｅｃ、Ｃｇ・ｒ＝８４μｓｅｃであるから、このままではカップリング容量Ｃｋによる混話が問題となる。即ち、Ｘ電極とＹ電極との間の結合容量Ｃｋによって混話が生じる。これを防ぐための電極構造を説明する。第７図は係る電極構造を示す図であり、同図（Ａ）、（Ｂ）に示す如く、Ｘ電極１０１とＹ電極１０２の交叉部分の電極面積をＷ２の如く小さくする。例えば交叉部分の電極巾を０．１ｍｍとすれば、結合容量は３．５ＰＦに低下し、混話が生じにくくなる。一方電極巾を小さくすると、指等が電極に接触する確率が小さくなることから交叉部分以外の電極巾は第７図（Ａ）のＷ１の如く大きくとってある。第７図（Ｂ）の場合には更に接触確率を向上させるため電極で囲まれた領域にＸ電極１０１に対し三角形の接触用電極Ａを、Ｙ電極１０２に対し三角形の接触用電極Ｂを設けている。

一方、係るセンサパネル１０をＣＡＤ（Ｃｏｍｐｕｔｅｒ Ａｉｄｅｄ Ｄｅｓｉｇｎ）等の細かな座標指定に用いるには人間の指では太すぎる場合やセンサパネル１０上を指で直接触れたくない場合がある。第８図は係る場合の指示入力方式の説明図である。

第８図（Ａ）に示す如く手に細かい金属棒３０を持ち金属棒３０の先端でセンサパネル１０の所望の電極に接触し、静電容量変化を生ぜしめる。この様にすればセンサパネル１０上の所定位置を精度良く指定できる。この場合、第８図（Ｂ）の

如く金属棒３０は固いため、センサパネル１０の接触面は点Ｐの如く点接触となり、Ｘ電極１０１の付加電極Ａのみに触れ、Ｘ、Ｙ各電極１０１、１０２の付加電極Ａ、Ｂの双方に同時触れないことがありうる。

第９図は係る場合を考慮して指示入力手段を改良した実施例である。第９図（Ａ）に示す如く、金属棒３１の先端に円柱状の凹みを設け、係る円柱状凹みを埋め込む形で導電性ゴム３２を埋め込んだものである。導電性ゴムは比較的柔らかいので、金属棒３１をセンサパネル１０面上に押し付けると、第９図（Ｂ）の如く導電性ゴム３２の直径巾までの直径の接触面積を得ることが出来、第８図（ａ）の問題は解消する。

第１０図は第２図構成の位置検出回路の一実施例回路図であり、図ではＸ側検出回路のみ示してあるが、Ｙ側も同一構成である。図中、１７０、１７１はオペアンプであり、蓄積コンデンサＣｓのバッファアンプの役目を果たすもの、ＳＷ１、ＳＷ２、ＳＷ３はスイッチであり、スイッチＳＷ１、ＳＷ３とスイッチＳＷ２が相補的にスイッチ動作するものであり、オペアンプ１７０、１７１、スイッチＳＷ１、ＳＷ２、ＳＷ３、蓄積コンデンサＣｓによって２段のアナログシフトレジスタを構成する。１７２は差動増巾器であり、スイッチＳＷ１の出力Ｘｏ（ｔ－Ｔ）と、スイッチＳＷ３の出力Ｘｏ（ｔ）との差分ΔＸ（ｔ）を取るもの、１７３は比較器であり、差動増巾器１７２の出力ΔＸ（ｔ）と基準値ＶＲＥＦとを比較し、出力ΔＸ（ｔ）がＶＲＥＦ以上の時に出力パルスを発するもの、１７４はアンドゲートであり、ストローブパルスＳＴＲＯＢＥと出力パルスとの論理積をとるもの、１７５はフリップフロップであり、走査開始信号ＳＴでセットされ、アンドゲート１７４の出力Ｐｔｘｏでリセットされ、走査開始から出力Ｐｔｘｏの発生するまでの時間巾ｔｘｏのゲート信号を出力するもの、１７６はアンドゲートであり、クロックパルスＣＬをゲート信号期間中出力するもの、１７７はカウンタであり、アンドゲート１７６からのクロックパルスＣＬを計数し、Ｘ座標（時間ｔｘｏに相当）を示すものである。

次に、第１０図実施例構成の動作について第１１図各部波形図に基いて説明する。

スイッチＳＷ１には前述の加算回路１５の出力ＸＯが印加される。スイッチＳＷ１及びスイッチＳＷ３はクロックＣＬ１によってオン／オフ動作し、スイッチＳＷ２はクロックＣＬ１と位相の反対のクロックＣＬ２によってオン／オフ動作するから、スイッチＳＷ１、ＳＷ３とスイッチＳＷ２は相補的に制御される。従って、オペアンプ１７０、スイッチＳＷ２、オペアンプ１７１、スイッチＳＷ３を通ることより、加算出力ＸＯは１クロック分遅延させられる。

従って、差動増巾器１７２には出力ＸＯ（ｔ）とＸＯ（ｔ－Ｔ）が入力され、差分ΔＸ（ｔ）が得られる。差分ΔＸ（ｔ）は比較器１７３で基準値ＶＲＥＦでスライスされ、出力パルスとなる。この出力パルスはアンドゲート１７４でストローブパルスＳＴＲＯＢＥに同期化され、パルスＰｔｘｏとなる。一方、フリップフロップ１７５は走査開始信号ＳＴでセットされ、アンドゲート１７６を開き、カウンタ１７７にクロックパルスＣＬ（第４図）の計数を行なわしめる。前述のパルスＰｔｘｏはフリップフロップ１７５をリセットし、アンドゲート１７６を閉じ、カウンタ１７７にクロックパルスの入力を停止する。これによりカウンタ１７７には走査開始からパルスＰｔｘｏの発生までの時間ｔｘｏに相当する座標値が得られ、Ｘ座標の検出が可能となる。尚、Ｙ側についても同様であり説明を省略する。人間の持つ静電容量は、条件にもよるが、１０００ＰＦ～２０００ＰＦのオーダであるから、人の指又は導体を介してされることにより、接触位置の電極の時定数は、一時的に１２ＫΩ×（１０００～２０００ＰＦ）＝１２μｓ～２４μｓのオーダとなり、駆動パルス巾が３μｓの場合、接触位置に交叉するＸ、Ｙ電極の出力は殆んど零となる。

第１２図は第２図構成の位置検出回路の他の実施例回路図であり、第１０図実施例同様Ｘ側のみ示してあるが、Ｙ側についても同様である。図中、

１８０はアナログ・デジタル変換器（以下ADコンバータと称す）であり、入力される加算出力XOのレベルをデジタル値DXOに変換するもの、１８１はメモリであり、センサパネル１０に何も触れられていない状態における各X電極の出力レベルを格納するもの。１８２はメモリアドレス回路であり、クロックパルスCL（第４図）を計数し、走査された電極位置に対応するアドレスを発生するもの。１８３はリード／ライト制御回路であり、メモリ１８１のリード／ライトを制御するもの、１８４はデジタルコンパレータであり、メモリ１８１からのデジタル値とADコンバータ１８０からのデジタル値とを比較するもの、１８５はアンドゲートであり、コンパレータ１８４の出力とストローブパルスSTROBEの論理積をとるもの、１８６はアンドゲートであり、アンドゲート１８５の出力によってアドレス回路１８２の発生アドレス値を出力するもの、１８７はバッファであり、アンドゲート１８６からのアドレス値を格納するものである。SW４はスイッチであり、ADコンバータ１８０とメモリ１８１又はコンパレータ１８５とを接続するものである。

次に第１２図実施例構成の動作について第１３図各部波形図により説明する。

先ずスイッチSW４をメモリ１８１側に接続し、リード／ライト制御回路１８３からはメモリ１８１にライトモードを指示する。この状態でセンサパネル１０に何も触れていない様にして、前述の各X電極１０１a～１０１mの走査を開始する。これにより、加算回路１５から加算出力XOが発生し、ADコンバータ１８０でその出力レベルがデジタル値DXOに変換され、スイッチSW４を介しメモリ１８１に入力する。メモリアドレス回路１８２は走査回路１１（第２図）を走査せしめるクロックパルスCLと同一のクロックパルスCLを計数し、メモリ１８１に書込みアドレスを与えるので、結局メモリ１８１には各X電極１０１a～１０１mを実際に走査駆動した時の出力レベルが各X電極１０１a～１０１m対応に格納される。この様にしてメモリ１８１にセンサパネル１０が触れられていない時の各電極の出力レベルを基準値として読込んでおく。次に実際に座標入力する時は、スイッチSW４がコンパレータ１８４側に接続され、一方リード／ライト制御回路１８３はメモリ１８１にリードモードを指示する。この状態で加算回路１５からの加算出力XOがADコンバータ１８０に入力すると、そのレベルがデジタル値に変換され、コンパレータ１８４に入力する。一方メモリアドレス回路１８２は走査回路１１の走査と同期しているので、走査されたX電極に対応する前述の基準値をメモリ１８１から読出し、コンパレータ１８４に与える。コンパレータ１８４は両入力を比較し、相違していれば出力パルスDPを発生する。第１３図では、メモリ１８１からDXO（kT）が基準値として読出され、一方加算出力はDXO（k＋mT）であることを示し、ΔDだけ差が生じていることを示している。この出力パルスDPはアンドゲート１８５でストローブパルスSTROBEで同期化され、検出パルスPtxoを出力する。一方、前述のメモリアドレス回路１８２は走査回路１１の走査と同期しているので、その時のX電極、即ちX座標はメモリアドレス回路１８２のアドレスであるから、アンドゲート１８６を検出パルスPtxoで開き、メモリアドレス回路１８２のアドレスをバッファ１８７にセットする。この様にして検出パルスPtxoの時間間隔txoに相当するX座標を得ることができる。尚、Y側についても同様であり説明を省略する。この様に構成することによって、各電極の接触前後におけるレベルを直接比較せしめ各電極による出力レベルのバラツキの影響を少なくすることができ、検出の安定度を向上させる他に、微少の静電容量変化も検出でき、高感度の検出を可能とする。

ADコンバータとして８ビット程度の並列形ADコンバータを用いても理論上は2^8のレベル差を容易に検出出来る。

（発明の効果）

以上説明した様に、本発明によれば、基板上に複数のX側透明導電線路と複数のY側透明導電線

路とを互いに絶縁して配置したセンサパネルと、各々該複数のＸ側及びＹ側透明導電線路を順次駆動走査するＸ側及びＹ側ドライブ回路と、各々該複数のＸ側及びＹ側透明導電線路の出力を加算するＸ側及びＹ側加算回路と、該Ｘ側及びＹ側加算回路の出力レベル変化を検出し、該出力レベル変化の生じた時間位置により指示された座標位置を検出する位置検出回路とを有し、該センサパネルの所定位置を指示した時に生じる静電容量変化によって該出力レベル変化を生ぜしめて指示された座標位置を検出する様にしているので、装置自体をコンパクトに構成することが可能となり、特にディスプレイ装置に装着する際にディスプレイ装置の形状を損なうことなく、しかも表示内容が見にくくなることを防止しうるという効果を奏し、ディスプレイと一体化し、座標入力装置の存在を感じさせないで、入力機能を付与しうる。しかも集積化し易いので回路構成も小型化しうるという効果も奏する。更に、分解能の向上も容易なためＣＡＤシステムの様な高精度の座標入力が可能となるという効果を奏する他にパネル自体はスパッタ等の量産に適した薄膜成長技術で可能なため、安価にしかも容易に構成しうるという効果も奏する。

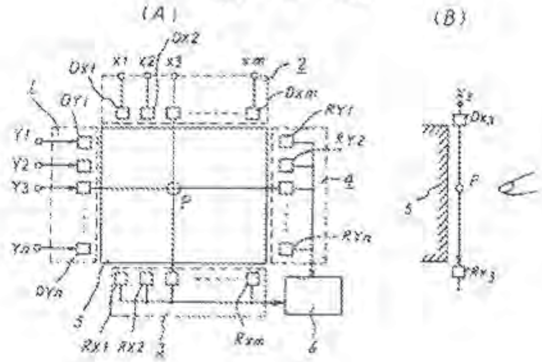
4．図面の簡単な説明

第１図は従来の座標入力装置構成図、第２図は本発明の一実施例全体構成図、第３図は第２図構成のセンサパネルの断面図、第４図は第２図構成の各部波形図、第５図は第２図構成のセンサパネルの詳細構成図、第６図は第２図構成のセンサパネルの等価回路図、第７図は第２図構成のセンサパネルの電極構成の一実施例を説明する図、第８図は本発明に用いられる指示入力方式の一実施例説明図、第９図は本発明に用いられる指示入力方式の他の実施例説明図、第１０図は第２図構成の位置検出回路の一実施例回路図、第１１図は第１０図構成の各部波形図、第１２図は第２図構成の位置検出回路の他の実施例回路図、第１３図は第１２図構成の各部波形図である。

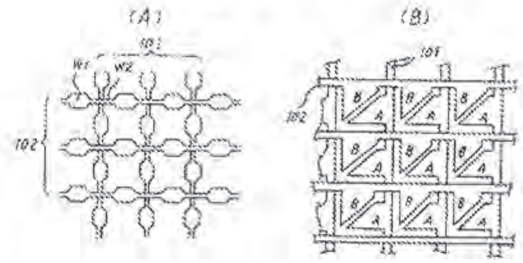
図中、１０…センサパネル、１１…Ｘ側走査回路、１２…Ｘ側駆動回路、１３…Ｙ側走査回路、１４…Ｙ側駆動回路、１５…Ｘ側加算回路、１６…Ｙ側加算回路、１７…位置検出回路、１０１a～１０１m…Ｘ側透明導電線路、１０２a～１０２n…Ｙ側透明導電線路。

特許出願人　富士通株式会社
代理人弁理士　山谷晧榮

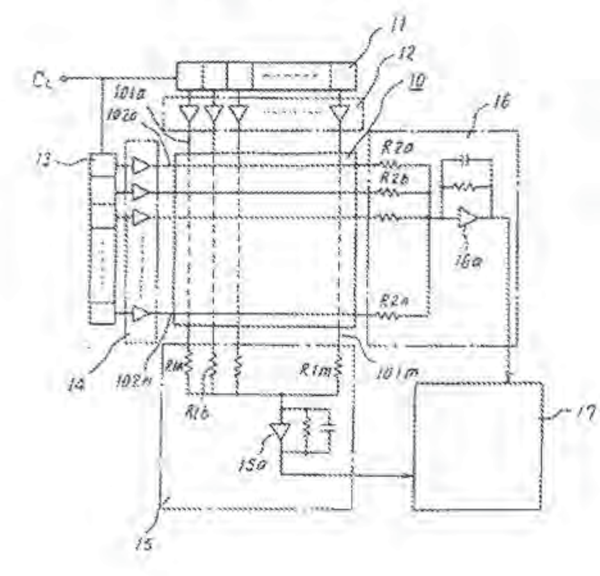
第 1 図



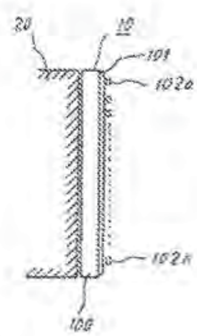
第 7 図



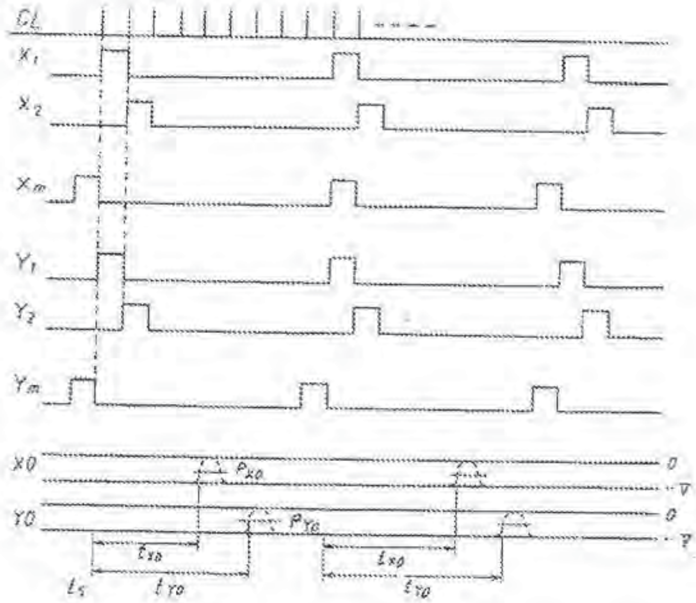
第 2 図



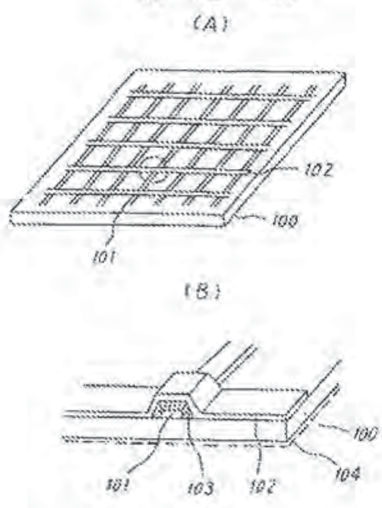
第 3 図



第4図



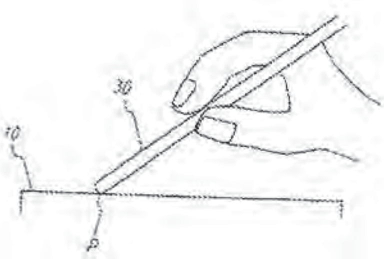
第5図



第6図

第 8 図

(A)



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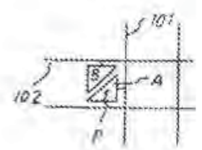
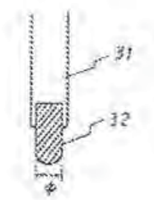


第 9 図

(A)



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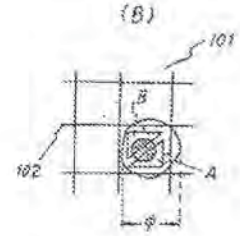

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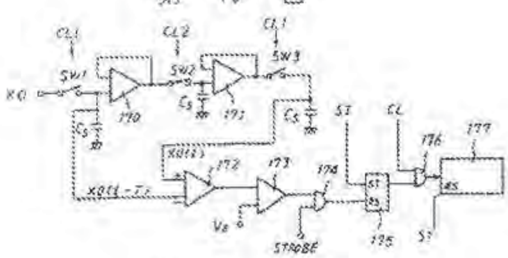
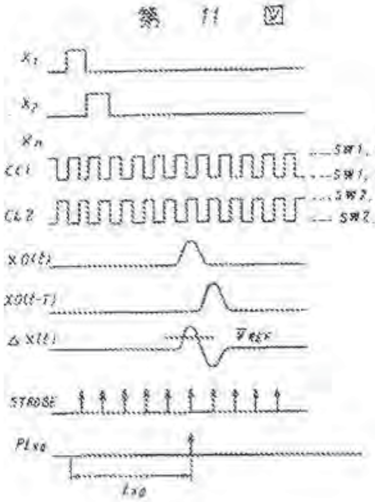


第 11 図



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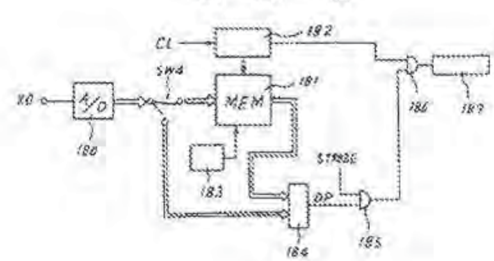
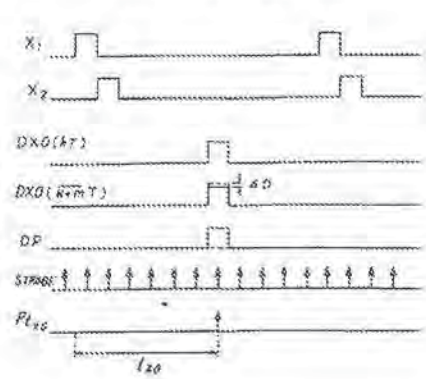


第 13 図



Electronic Acknowledgement Receipt

EFS ID:	6925775
Application Number:	11842747
International Application Number:	
Confirmation Number:	3897
Title of Invention:	CONDUCTOR PATTERN STRUCTURE OF CAPACITIVE TOUCH PANEL
First Named Inventor/Applicant Name:	Ching-Yang Chang
Customer Number:	34313
Filer:	Jeffrey A. Miller/Rita Hernandez
Filer Authorized By:	Jeffrey A. Miller
Attorney Docket Number:	22271.4002
Receipt Date:	01-FEB-2010
Filing Date:	21-AUG-2007
Time Stamp:	19:12:15
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		4002_IDS_02_01_10.pdf	977497 7ea24d0239acebc0378195ef1230095ad940f355	yes	4

	Multipart Description/PDF files in .zip description		
	Document Description	**Start**	**End**
	Transmittal Letter	1	3
	Information Disclosure Statement (IDS) Filed (SB/08)	4	4

Warnings:

Information:

2	Foreign Reference	JP60075927.pdf	2402684 e531cf5040b2b47737dea22822c80343e1dace06	no	11

Warnings:

Information:

3	NPL Documents	EP_OA_01_09_2009.pdf	1978770 007c1f0dacb7f653c0952c880d2292c6fa08907c	no	37

Warnings:

Information:

4	NPL Documents	file_wrapper.pdf	21698099 abe7bd1bfaa347fa3d05d71effb120fc4744b15e	no	504

Warnings:

Information:

5	NPL Documents	Korean_OA_20070133201.pdf	1514181 76b2146cde3ad51c5846de9d3ce5aebd4f251ace2	no	6

Warnings:

Information:

Total Files Size (in bytes):	28571231

This Acknowledgement Receipt evidences receipt on the noted date by the USPTO of the indicated documents, characterized by the applicant, and including page counts, where applicable. It serves as evidence of receipt similar to a Post Card, as described in MPEP 503.

<u>New Applications Under 35 U.S.C. 111</u>
If a new application is being filed and the application includes the necessary components for a filing date (see 37 CFR 1.53(b)-(d) and MPEP 506), a Filing Receipt (37 CFR 1.54) will be issued in due course and the date shown on this Acknowledgement Receipt will establish the filing date of the application.

<u>National Stage of an International Application under 35 U.S.C. 371</u>
If a timely submission to enter the national stage of an international application is compliant with the conditions of 35 U.S.C. 371 and other applicable requirements a Form PCT/DO/EO/903 indicating acceptance of the application as a national stage submission under 35 U.S.C. 371 will be issued in addition to the Filing Receipt, in due course.

<u>New International Application Filed with the USPTO as a Receiving Office</u>
If a new international application is being filed and the international application includes the necessary components for an international filing date (see PCT Article 11 and MPEP 1810), a Notification of the International Application Number and of the International Filing Date (Form PCT/RO/105) will be issued in due course, subject to prescriptions concerning national security, and the date shown on this Acknowledgement Receipt will establish the international filing date of the application.

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Appl. No.	:	11/842,747	Confirmation No.	3897
Applicant	:	Ching-Yang Chang, et al.		
Filing Date	:	August 21, 2007		
Title	:	Conductor Pattern Structure of Capacitive Touch Panel		
Group Art Unit	:	2629		
Examiner	:	Not Yet Assigned		
Docket No.	:	22271-4002		
Customer No.	:	34313		

Mail Stop: Patent Application
Commissioner for Patents
PO Box 1450
Alexandria, VA 22313-1450

INFORMATION DISCLOSURE STATEMENT

Sir:

In accordance with 37 CFR §§ 1.97 and 1.98, the items identified in this Information Disclosure Statement ("IDS") are brought to the attention of the Office. The items are listed on the attached form PTO-1449 and copies are enclosed for the convenience of the Examiner.

The items identified in this IDS may or may not be "material" pursuant to 37 CFR § 1.56. The submission thereof by Applicant is not to be construed as an admission that any such patent, publication or other information referred to therein is material or considered to be material (37 CFR § 1.97(h)), or even qualifies as "prior art" under 35 USC § 102 with respect to this invention unless specifically designated by Applicant as such.

INFORMATION DISCLOSURE STATEMENT FILING PROVISION:

☒ This IDS is believed to be timely in that it is being submitted under 37 CFR § 1.97(b), that is (1) within three months of the filing date of the application, which is not a continued prosecution application filed under § 1.53(d); or (2) within three months of entry of the national stage as set forth in 37 CFR § 1.491; or (3) before the mailing of a first Office action on the merits; or (4) before the mailing of a first Office action after filing a request for continued examination under § 1.114. Thus, no fee is required.

- ☒ However, if the undersigned is in error in this regard, Applicant respectfully requests that the Office consider this IDS as filed under 37 CFR § 1.97(c), if applicable, and charge the fee due under 37 CFR §1.17(p) to the deposit account referenced below.
- ☐ However, if the undersigned is in error in this regard, Applicant respectfully requests that the Office consider this IDS as filed under 37 CFR § 1.97(c), if applicable, and a statement under 37 CFR § 1.97(e) is included below, thus no fee is required.

☐ This IDS is being submitted under 37 CFR § 1.97(c), that is after mailing of a first Office action on the merits, but before a Final Action under 37 CFR § 1.113 or a Notice of Allowance under 37 CFR § 1.311.

- ☐ The fee due under 37 CFR § 1.17(p) is submitted herewith.
- ☐ A statement under 37 CFR § 1.97(e) is included below, thus no fee is required. In the event that this IDS is not received before a Final Action or a Notice of Allowance, then Applicant respectfully requests that the Office consider the filing of these papers to be submitted under 37 CFR § 1.97(d) and charge the fee due under 37 CFR § 1.17(p) to the deposit account below.

☐ This IDS is being submitted under 37 CFR § 1.97(d), that is after a Final Action under 37 CFR § 1.113 or a Notice of Allowance under 37 CFR § 1.311, but before payment of the issue fee. A statement under 37 CFR § 1.97(e) is included below. The fee due under 37 CFR § 1.17(p) is submitted herewith.

Applicant	:	Ching-Yang Chang, et al.
Appl. No.	:	11/842,747
Examiner	:	Not Yet Assigned
Docket No.	:	22271-4002

STATEMENT UNDER 37 CFR § 1.97(e):

☐ Each item contained in this IDS was first cited in any communication from a foreign patent office in a counterpart foreign application not more than three months prior to the filing of this IDS.

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

PAYMENT AND/OR AUTHORIZATION TO CHARGE FEES:

☐ A check in the amount of__ is enclosed for the above fee(s).

☐ Please charge $_____ to Deposit Account No. **15-0665** for the above fee(s).

☒ The Commissioner is authorized to charge any fees required by the filing of these papers, and to credit any overpayment to Orrick, Herrington & Sutcliffe's Deposit Account No. **15-0665**.

Respectfully submitted,

ORRICK, HERRINGTON & SUTCLIFFE LLP

Dated: February 1, 2010

By: [signature]
Hanbum Cho
Reg. No. 58,993

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UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
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Alexandria, Virginia 22313-1450
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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
11/842,747	08/21/2007	Ching-Yang Chang	22271.4002	3897

34313 7590 06/25/2010

ORRICK, HERRINGTON & SUTCLIFFE, LLP
IP PROSECUTION DEPARTMENT
4 PARK PLAZA
SUITE 1600
IRVINE, CA 92614-2558

EXAMINER	
HICKS, CHARLES V	
ART UNIT	**PAPER NUMBER**
2629	

MAIL DATE	DELIVERY MODE
06/25/2010	PAPER

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.

Office Action Summary	**Application No.** 11/842,747	**Applicant(s)** CHANG ET AL.	
	Examiner CHARLES HICKS	**Art Unit** 2629	

-- 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_ MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, 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 _21 August 2007_.

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

3)☐ 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

4)☒ Claim(s) _1-10_ is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) _1-10_ is/are rejected.

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

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

Application Papers

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

10)☒ The drawing(s) filed on _21 August 2007_ 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).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

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).

a)☒ All b)☐ Some * c)☐ None of:

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) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)

3) ☒ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _11/19/2008; 01/06/2009; 02/04/2009; 02/01/2010_.

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

5) ☐ Notice of Informal Patent Application

6) ☐ Other: _____.

DETAILED ACTION

Claim Rejections - 35 USC § 102

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

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

Claims 1 and 6 are rejected under 35 U.S.C. 102(b) as being anticipated by Seely et al. (US 6,188,391).

In reference to claim 1, Seely teaches a conductor pattern structure of a capacitive touch panel, which is adapted to form on a surface of a substrate (Seely, Abstract),

the touch-control pattern structure comprising: a plurality of first-axis conductor assemblies, each first-axis conductor assembly comprising a plurality of first-axis conductor cells arranged on the substrate surface along a first axis in a substantially equally-spaced manner (Seely, col. 3, ll. 8-15),

a disposition zone being delimited between adjacent ones of the first-axis conductor assemblies and between adjacent ones of the first-axis conductor cells (Seely, Fig. 1C; col. 3, ll. 16-34);

a plurality of first-axis conduction lines respectively connecting between adjacent ones of the first-axis conductor cells of each first-axis conductor assembly so that the first-axis conductor cells of each respective first-axis conductor assembly are electrically connected together (Seely, col. 3, ll. 8-15);

a plurality of insulation layers each covering a surface of each first-axis conduction line (Seely, col. 6, ll. 43-54);

a plurality of second-axis conductor assemblies, each second-axis conductor assembly comprising a plurality of second-axis conductor cells arranged on the substrate surface along a second axis in a substantially equally-spaced manner (Seely, col. 3, ll. 8-15),

each second-axis conductor cell being set in each disposition zone (Seely, Fig. 1C; col. 3, ll. 16-34);

and a plurality of second-axis conduction lines respectively connecting between adjacent ones of the second-axis conductor cells of each second-axis conductor assembly so that the second-axis conductor cells of each respective second-axis conductor assembly are electrically connected together (Seely, col. 3, ll. 8-15),

the second-axis conduction line being extended across a surface of the insulation layer of the respective first-axis conduction line (Seely, col. 6, ll. 43-54).

In reference to claim 6, Seely teaches a conductor pattern structure of a capacitive touch panel adapted to form on a surface of a substrate (Seely, Abstract),

the touch-control pattern structure comprising: at least two adjacent first-axis conductor cells (Seely, Fig. 8A; col. 3, ll. 8-15), and at least two adjacent second-axis conductor cells (Seely, Fig. 8A; col. 3, ll. 8-15),

wherein the adjacent first-axis conductor cells are connected by a first-axis conduction line provided there between (Seely, col. 3, ll. 8-15),

characterized in that an insulation layer is formed on a surface of the first-axis conduction line (Seely, col. 6, ll. 43-54),

and a second-axis conduction line extends across a surface of the insulation layer to connect between the adjacent second-axis conductor cells (Seely, col. 3, ll. 8-15).

Claim Rejections - 35 USC § 103

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

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

This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

Claims 2-4 and 7-9 are rejected under 35 U.S.C. 103(a) as being unpatentable over Seely et al. (US 6,188,391) in view of Hsu et al. (US 7,030,860).

Claim 2 is rejected as being dependent on rejected claim 1 as discussed above and further, Seely however fails to expressly teach wherein the first-axis conductor cells and the second-axis conductor cells consist of a transparent conductive material.

Hsu discloses a capacitive touch sensing system, analogous in art with that of Seely, wherein first-axis conductor cells and second-axis conductor cells consist of a transparent conductive material (Hsu, col. 2, ll. 60-62).

At the time the invention was made, it would have been obvious to one having ordinary skill in the art to substitute the touch sensor cells of Seely, wherein the first-axis conductor cells and the second-axis conductor cells consist of a transparent conductive material, as taught by Hsu.

As one of ordinary skill in the art would appreciate, the suggestion/motivation for doing so would have been to enable the user of the capacitive touch sensor input device to visualize an underlying surface, such as a display (Hsu, Abstract).

Claim 3 is rejected as being dependent on rejected claim 1 as discussed above and further, Seely however fails to expressly teach wherein the first-axis conduction lines and the second-axis conduction lines consist of a transparent conductive material.

Hsu discloses a capacitive touch sensing system, analogous in art with that of Seely, first-axis conduction lines and second-axis conduction lines consist of a transparent conductive material (Hsu, col. 4, ll. 36-52).

At the time the invention was made, it would have been obvious to one having ordinary skill in the art to substitute the conductive lines of Seely, wherein the first-axis conduction lines and the second-axis conduction lines consist of a transparent conductive material, as taught by Hsu.

As one of ordinary skill in the art would appreciate, the suggestion/motivation for doing so would have been to enable the user of the capacitive touch sensor input device to visualize an underlying surface, such as a display (Hsu, Abstract).

Claim 4 is rejected as being dependent on rejected claim 1 as discussed above and further, Seely however fails to expressly teach wherein the insulation layer consists of a transparent insulation material.

Hsu discloses a capacitive touch sensing system, analogous in art with that of Seely, wherein an insulation layer consists of a transparent insulation material (Hsu, col. 4, ll. 36-52).

At the time the invention was made, it would have been obvious to one having ordinary skill in the art to substitute the insulation layer of Seely, wherein the insulation layer consists of a transparent insulation material, as taught by Hsu.

As one of ordinary skill in the art would appreciate, the suggestion/motivation for doing so would have been to enable the user of the capacitive touch sensor input device to visualize an underlying surface, such as a display (Hsu, Abstract).

Claim 7 is rejected as being dependent on rejected claim 6 as discussed above and further, Seely however fails to expressly teach wherein the first-axis conductor cells and the second-axis conductor cells consist of a transparent conductive material.

Hsu discloses a capacitive touch sensing system, analogous in art with that of Seely, wherein first-axis conductor cells and second-axis conductor cells consist of a transparent conductive material (Hsu, col. 2, ll. 60-62).

At the time the invention was made, it would have been obvious to one having ordinary skill in the art to substitute the touch sensor cells of Seely, wherein the first-axis conductor cells and the second-axis conductor cells consist of a transparent conductive material, as taught by Hsu.

As one of ordinary skill in the art would appreciate, the suggestion/motivation for doing so would have been to enable the user of the capacitive touch sensor input device to visualize an underlying surface, such as a display (Hsu, Abstract).

Claim 8 is rejected as being dependent on rejected claim 6 as discussed above and further, Seely however fails to expressly teach wherein the first-axis conduction line and the second-axis conduction line consist of a transparent conductive material.

Hsu discloses a capacitive touch sensing system, analogous in art with that of Seely, first-axis conduction line and second-axis conduction line consist of a transparent conductive material (Hsu, col. 4, ll. 36-52).

At the time the invention was made, it would have been obvious to one having ordinary skill in the art to substitute the conductive lines of Seely, wherein the first-axis conduction line and the second-axis conduction line consist of a transparent conductive material, as taught by Hsu.

As one of ordinary skill in the art would appreciate, the suggestion/motivation for doing so would have been to enable the user of the capacitive touch sensor input device to visualize an underlying surface, such as a display (Hsu, Abstract).

Claim 9 is rejected as being dependent on rejected claim 6 as discussed above and further, Seely however fails to expressly teach wherein the insulation layer consists of a transparent insulation material.

Hsu discloses a capacitive touch sensing system, analogous in art with that of Seely, wherein an insulation layer consists of a transparent insulation material (Hsu, col. 4, ll. 36-52).

At the time the invention was made, it would have been obvious to one having ordinary skill in the art to substitute the insulation layer of Seely, wherein the insulation layer consists of a transparent insulation material, as taught by Hsu.

As one of ordinary skill in the art would appreciate, the suggestion/motivation for doing so would have been to enable the user of the capacitive touch sensor input device to visualize an underlying surface, such as a display (Hsu, Abstract).

Claims 5 and 10 are rejected under 35 U.S.C. 103(a) as being unpatentable over Seely et al. (US 6,188,391) in view of Mulligan et al. (US 2004/0119701).

Claim 5 is rejected as being dependent on rejected claim 1 as discussed above and further, Seely however fails to teach wherein the first-axis conductor cells and the second-axis conductor cells have a contour of hexagonal shape.

Mulligan discloses a touch sensing system, analogous in art with that of Seely, wherein first-axis conductor cells and second-axis conductor cells have a contour of hexagonal shape (Mulligan, pg. 4, par. 38).

At the time the invention was made, it would have been obvious to one having ordinary skill in the art to substitute the cells of Seely, wherein the first-axis conductor cells and the second-axis conductor cells have a contour of hexagonal shape, as taught by Mulligan.

As one of ordinary skill in the art would appreciate, the suggestion/motivation for doing so would have been simple substitution of one known element, hexagonal shaped sensor cells, for another to obtain predictable results, namely, a capacitive touch sensor input device (Mulligan, pg. 4, par. 38).

Claim 10 is rejected as being dependent on rejected claim 6 as discussed above and further, Seely however fails to teach wherein the first-axis conductor cells and the second-axis conductor cells have a contour of hexagonal shape.

Mulligan discloses a touch sensing system, analogous in art with that of Seely, wherein first-axis conductor cells and second-axis conductor cells have a contour of hexagonal shape (Mulligan, pg. 4, par. 38).

At the time the invention was made, it would have been obvious to one having ordinary skill in the art to substitute the cells of Seely, wherein the first-axis conductor cells and the second-axis conductor cells have a contour of hexagonal shape, as taught by Mulligan.

As one of ordinary skill in the art would appreciate, the suggestion/motivation for doing so would have been simple substitution of one known element, hexagonal shaped sensor cells, for another to obtain predictable results, namely, a capacitive touch sensor input device (Mulligan, pg. 4, par. 38).

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to CHARLES HICKS whose telephone number is 571-270-7535. The examiner can normally be reached on Monday-Thursday from 7:30 to 4:00.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Sumati Lefkowitz, can be reached on 571-272-3638). 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://portal.uspto.gov/external/portal. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

/Sumati Lefkowitz/
Supervisory Patent Examiner, Art Unit 2629

Notice of References Cited	Application/Control No. 11/842,747	Applicant(s)/Patent Under Reexamination CHANG ET AL.	
	Examiner CHARLES HICKS	Art Unit 2629	Page 1 of 1

U.S. PATENT DOCUMENTS

*		Document Number Country Code-Number-Kind Code	Date MM-YYYY	Name	Classification
*	A	US-6,188,391	02-2001	Seely et al.	345/173
*	B	US-7,030,860	04-2006	Hsu et al.	345/173
*	C	US-2004/0119701	06-2004	Mulligan et al.	345/173
	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	Classification
	N					
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	S					
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NON-PATENT DOCUMENTS

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

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

Index of Claims	Application/Control No. 11842747	Applicant(s)/Patent Under Reexamination CHANG ET AL.
	Examiner CHARLES HICKS	Art Unit 2629

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

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

CLAIM		DATE								
Final	Original	06/07/2010								
	1	✓								
	2	✓								
	3	✓								
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	6	✓								
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	10	✓								

Search Notes	Application/Control No.	Applicant(s)/Patent Under Reexamination
	11842747	CHANG ET AL.
	Examiner	**Art Unit**
	CHARLES HICKS	2629

SEARCHED

Class	Subclass	Date	Examiner
345	173-184	06/07/2010	CH
178	18.01-18.08	06/07/2010	CH
341	33-34	06/07/2010	CH

SEARCH NOTES

Search Notes	Date	Examiner
Inventor search	06/07/2010	CH
East search	06/07/2010	CH

INTERFERENCE SEARCH

Class	Subclass	Date	Examiner

FEB 04 2009

PTO/SB/08A (08-03)
Approved for use through 07/31/2006. OMB 0651-0031
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INFORMATION DISCLOSURE STATEMENT BY APPLICANT

(Use as many sheets as necessary)

Sheet 1 of 1

Complete if Known	
Application Number	11/842,747
Filing Date	8/21/2007
First Named Inventor	Ching-Yang Chang, et al.
Art Unit	2629
Examiner Name	R. Hjerpe
Attorney Docket Number	MR2863-351

U. S. PATENT DOCUMENTS

Examiner Initials*	Cite No.[1]	Document Number Number-Kind Code[2] (if known)	Publication Date MM-DD-YYYY	Name of Patentee or Applicant of Cited Document	Pages, Columns, Lines, Where Relevant Passages or Relevant Figures Appear
	F	US- 7,292,229	11/6/2007	Morag, et al.	
	G	US- 6,005,555	12/21/1999	Katsurahira, et al.	
	H	US- 5,381,160	1/10/1995	Landmeier	
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FOREIGN PATENT DOCUMENTS

Examiner Initials*	Cite No.[1]	Foreign Patent Document Country Code[3] -Number[4] -Kind Code[5] (if known)	Publication Date MM-DD-YYYY	Name of Patentee or Applicant of Cited Document	Pages, Columns, Lines, Where Relevant Passages Or Relevant Figures Appear	T[6]

Examiner Signature	/Charles Hicks/	Date Considered	06/07/2010

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ALL REFERENCES CONSIDERED EXCEPT WHERE LINED THROUGH. /C.H./

EAST Search History

EAST Search History (Prior Art)

Ref #	Hits	Search Query	DBs	Default Operator	Plurals	Time Stamp
L1	2	"6188391".pn. or "6137427".pn.	US-PGPUB; USPAT	ADJ	ON	2010/06/07 12:35
L2	1095	(345/173-184.ccls. or 178/18.01-18.06.ccls. or 341/33-34.ccls.) and capacitive touch	US-PGPUB; USPAT	ADJ	ON	2010/06/07 12:42
L3	1	"6188391".pn. and capacit$5	US-PGPUB; USPAT	ADJ	ON	2010/06/07 12:43
L8	1	"6188391".pn. and (touch) and substrate	US-PGPUB; USPAT	ADJ	ON	2010/06/07 12:49
L9	1	"6188391".pn. and (horizontal or vertical)	US-PGPUB; USPAT	ADJ	ON	2010/06/07 12:52
L10	1	"6188391".pn. and (horizontal or vertical) and insulat$5	US-PGPUB; USPAT	ADJ	ON	2010/06/07 12:59
L11	0	"6188391".pn. and transparent	US-PGPUB; USPAT	ADJ	ON	2010/06/07 13:15
L12	1	("6188391".pn. or "6137427".pn.) and transparent	US-PGPUB; USPAT	ADJ	ON	2010/06/07 13:15
L13	16	l2 and (transparent same capacitive same cell)	US-PGPUB; USPAT	ADJ	ON	2010/06/07 13:17
L14	8	l2 and (transparent same capacitive same cell) and (transparent same insulat$5)	US-PGPUB; USPAT	ADJ	ON	2010/06/07 13:17
L15	1	"7030860".pn. and (transparent same sensor)	US-PGPUB; USPAT	ADJ	ON	2010/06/07 13:25
L16	1	"7030860".pn. and (transparent)	US-PGPUB; USPAT	ADJ	ON	2010/06/07 13:30

L17	38	l2 and ((cell or sensor) same hexagon$4)	US-PGPUB; USPAT	ADJ	ON	2010/06/07 13:41
L18	38	l17 and (capacitive same touch)	US-PGPUB; USPAT	ADJ	ON	2010/06/07 13:42
S1	1	"20080264699"	US-PGPUB; USPAT	ADJ	ON	2010/06/07 10:55
S2	2	((CHING-YANG) near2 (CHANG)).INV.	US-PGPUB; USPAT	ADJ	ON	2010/06/07 10:55
S3	8	((SHUN-TA) near2 (CHIEN)).INV.	US-PGPUB; USPAT	ADJ	ON	2010/06/07 10:56
S5	3	(S2 or S3) and capacitive touch	US-PGPUB; USPAT	ADJ	ON	2010/06/07 10:56
S6	1051	(345/173-184.ccls. or 178/18.01-18.06.ccls.) and capacitive touch	US-PGPUB; USPAT	ADJ	ON	2010/06/07 11:16
S7	270	S6 and (second or y) axis	US-PGPUB; USPAT	ADJ	ON	2010/06/07 11:17
S8	3	S6 and ((second or y) axis same cell)	US-PGPUB; USPAT	ADJ	ON	2010/06/07 11:18

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Sheet 1 of 1

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Art Unit	2629
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Attorney Docket Number	MR2863-351

U. S. PATENT DOCUMENTS

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	C	US- 2006/0066581	3/30/2006	Lyon, et al.	
	D	US- 6,970,160	11/29/2005	Mulligan, et al.	
	E	US- 4,550,221	10/29/1984	Mabusth	
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Examiner Signature	/Charles Hicks/	Date Considered	06/07/2010

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INFORMATION DISCLOSURE STATEMENT BY APPLICANT (use as many sheets as necessary)				Complete if Known	
				Application Number	11/842,747
				Filing Date	August 21, 2007
				First Named Inventor	Ching-Yang Chang
				Art Unit	2629
				Examiner Name	Not Yet Assigned
Sheet	1	of	1	Attorney Docket Number	22271-4002
				Confirmation No.	3897

U.S. PATENT DOCUMENTS

Examiner Initials	Cite No.[1]	U.S. Patent Document Number	Kind Code[2]	Name of Patentee or Applicant of Cited Document	Date of Publications of Cited Documents MM-DD-YYYY	Pages, Columns, Lines, Where Relevant Passages or Figures Appear
	1	US2005/0030048	A1	Bolender	02/10/2005	
	2	US2009/0160682	A1	Bolender	06/25/2009	
	3	6,970,160	B2	Mulligan	11/29,2005	
	4	6,137,427		Binstead	10/24/2000	

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Examiner Initials	Cite No.[1]	Foreign Patent Document Office[3]	Number[4]	Kind Code[5]	Name of Patentee or Applicant of Cited Document	Date of Publications of Cited Documents MM-DD-YYYY	Pages, Columns, Lines, Where Relevant Passages or Figures Appear	English Abstract T[6]
			JP 60-075927			4/30/1985		yes

OTHER PRIOR ART - NON PATENT LITERATURE DOCUMENTS

Examiner Initials*	Cite No.[1]	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, page(s), volume-issue number(s), publisher, city and/or country where published.	T[2]
	CA	Korean Office Action; issue date, May 18, 2009 for SN 10-2007-0133201	
	CB	EP Office Action dated 01-01-2009; SN 07018556.6	
	CC	File Wrapper for U.S. Patent Application Serial No. 10/279,828	

Examiner Signature	OHS West:260819279.1 22271-4002 RHH/RHH /Charles Hicks/	Date Considered	06/07/2010

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Sheet 1 of 2

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Examiner Name	R. Hjerpe
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	A	US-6,188,391	2/13/2001	Seely, et al.	
	B	US-6,137,427	10/24/2000	Binstead	
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FOREIGN PATENT DOCUMENTS

Examiner Initials*	Cite No.[1]	Foreign Patent Document / Country Code[3] Number[4] Kind Code[5] (if known)	Publication Date MM-DD-YYYY	Name of Patentee or Applicant of Cited Document	Pages, Columns, Lines, Where Relevant Passages Or Relevant Figures Appear	T[6]

Examiner Signature	/Charles Hicks/	Date Considered	06/07/2010

*EXAMINER: Initial if reference considered, whether or not citation is in conformance with MPEP 609. Draw line through citation if not in conformance and not considered. Include copy of this form with next communication to applicant. [1]Applicant's unique citation designation number (optional). [2]See Kinds Codes of USPTO Patent Documents at www.uspto.gov or MPEP 901.04. [3] Enter Office that issued the document, by the two-letter code (WIPO Standard ST.3). [4] For Japanese patent documents, the indication of the year of the reign of the Emperor must precede the serial number of the patent document. [5]Kind of document by the appropriate symbols as indicated on the document under WIPO Standard ST.16 if possible. [6]Applicant is to place a check mark here if English language Translation is attached.

ALL REFERENCES CONSIDERED EXCEPT WHERE LINED THROUGH. /C.H./

PTO/SB/08B (04-03)
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INFORMATION DISCLOSURE STATEMENT BY APPLICANT

(Use as many sheets as necessary)

Sheet 2 of 2

Complete if Known	
Application Number	11/842,747
Filing Date	8/21/2007
First Named Inventor	Ching-Yang Chang, et al.
Art Unit	2629
Examiner Name	R. Hjerpe
Attorney Docket Number	MR2863-351

NON PATENT LITERATURE DOCUMENTS

Examiner Initials*	Cite No.[1]	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, page(s), volume-issue number(s), publisher, city and/or country where published.	T[2]
	AA	A Communication from the European Patent Office dated 16 September 2008 regarding the corresponding foreign patent application EP07018556.	

Examiner Signature	/Charles Hicks/	Date Considered	06/07/2010

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

1 Applicant's unique citation designation number (optional). 2 Applicant is to place a check mark here if English language Translation is attached.

This collection of information is required by 37 CFR 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 120 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, Washington, DC 20231. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. **SEND TO: Commissioner for Patents, Washington, DC 20231.**

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ALL REFERENCES CONSIDERED EXCEPT WHERE LINED THROUGH. /C.H./

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BIB DATA SHEET

CONFIRMATION NO. 3897

SERIAL NUMBER	FILING or 371(c) DATE	CLASS	GROUP ART UNIT	ATTORNEY DOCKET NO.
11/842,747	08/21/2007 **RULE**	345	2629	22271.4002

APPLICANTS
Ching-Yang Chang, Taipei, TAIWAN;
Shun-Ta Chien, Taipei, TAIWAN;

** **CONTINUING DATA** **************************

** **FOREIGN APPLICATIONS** *************************
TAIWAN 96115152 04/27/2007

** **IF REQUIRED, FOREIGN FILING LICENSE GRANTED** **
08/30/2007

Foreign Priority claimed ☑ Yes ☐ No 35 USC 119(a-d) conditions met ☑ Yes ☐ No Verified and Acknowledged /CHARLES V HICKS/ Examiner's Signature	☐ Met after Allowance Initials	STATE OR COUNTRY	SHEETS DRAWINGS	TOTAL CLAIMS	INDEPENDENT CLAIMS
		TAIWAN	5	10	2

ADDRESS
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UNITED STATES

TITLE
CONDUCTOR PATTERN STRUCTURE OF CAPACITIVE TOUCH PANEL

FILING FEE RECEIVED	FEES: Authority has been given in Paper	
425	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

BIB (Rev. 05/07)

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Appl. No.	:	11/842,747	Confirmation No.:	3897
Applicants	:	Ching-Yang Chang, *et al.*		
Filing Date	:	August 21, 2007		
Title	:	Conductor Pattern Structure Of Capacitive Touch Panel		
Group Art Unit	:	2629		
Examiner	:	Hicks, Charles V.		
Docket No.	:	22271-4002		
Customer No.	:	34313		

Via: USPTO EFS Web
Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

AMENDMENT AND RESPONSE

Dear Sir:

This paper is responsive to the Office Action mailed on June 25, 2010. Please amend the above-identified application as follows:

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

Remarks/Arguments begin on page 9 of this paper.

REMARKS

Claims 1-10 are pending.

Claims 1 and 6 are rejected under 35 U.S.C. §102(b) as being anticipated by U.S. Patent No. 6,188,391 to Seely, *et al.* ("Seely").

Claims 2-4 and 7-9 are rejected under 35 U.S.C. § 103(a) as being unpatentable over Seely in view of U.S. Patent No. 7,030,860 to Hsu, *et al.* ("Hsu").

Claims 5 and 10 are rejected under 35 U.S.C. §103(a) as being unpatentable over Seely in view of U.S. Patent Appl. No. 2004/0119701 by Mulligan, et al. ("Mulligan").

Claims 1-3 and 6-8 have been amended.

Claims 11-45 have been added.

Applicant respectfully requests entry of this amendment and reconsideration of the application in view of the foregoing amendments and the following.

CLAIM REJECTIONS

I. Rejections Under 35 U.S.C. § 102(b)

The Examiner rejected claims 1 and 6 under 35 U.S.C. §102(b) as being anticipated by Seely. 06/25/10 Office Action, p. 2. Applicant respectfully traverses the Examiner's rejection of claims 1 and 6 for the following reasons.

Seely discloses a capacitive touchpad realized using a two-layer printed circuit board as a substrate. Seely, col. 2, lines 14-18. The first layer formed on the printed circuit board is a single composite layer for horizontal and vertical sensor electrode traces, and the second layer formed on the underneath the printed circuit board includes the controller chip, sensor circuitry and/or related circuitry. Seely, col. 2, lines 18-24. According to Comprehensive Dictionary of

Electrical Engineering, printed circuit board is a substrate made from insulating material that has one or more sandwiched metallic conductor layers applied that are etched to form interconnecting traces useful for interconnecting components. Comprehensive Dictionary of Electrical Engineering, 2nd ed., p. 544, attached herewith for the Examiner's convenient reference as **Appendix A**. This is evidenced by Seely's own disclosure that the printed circuit board 62 is covered with copper 101 to form the horizontal traces and diamonds 68 (conductor cells) (See Seely, FIG. 8A; col. 6, line 65 – col. 7, line 2).

From the foregoing, Seely's printed circuit board used as a substrate for constructing its touchpad as well as the electrode traces and diamonds that are formed on the printed circuit board are made of a non-transparent material (*e.g.*, copper).

Claims 1 and 6 as amended now recite "**first-axis conductor cells and the second-axis conductor cells consist of a transparent conductive material**." Therefore, Applicant respectfully submits that the Examiner's rejections of claims 1 and 6 under 35 U.S.C. §102(b) have been overcome and should be withdrawn.

II. Rejections Under 35 U.S.C. § 103(a)

A. Claims 2-4 and 7-9

The Examiner rejected claims 2-4 and 7-9 under 35 U.S.C. §103(a) as being unpatentable over Seely in view of Hsu. 06/25/10 Office Action, p. 4. Regarding claim 2, the Examiner stated that Seely fails to expressly teach but Hsu does teach the first-axis conductor cells and the second-axis conductor cells consist of a transparent conductive material. 06/25/10 Office Action, p. 5.

Claims 1 and 6 have been amended to recite the feature of original claims 2 and 7. Therefore, the Examiner's rejection affecting claims 2 and 7 is applied to the amended claims 1 and 6. Applicant respectfully traverses this ground of rejection for the following reasons.

As discussed above in section (I), Seely discloses non-transparent printed circuit board including non-transparent copper electrode traces. Seely, Figs. 8A, 8B, and 9; col. 6, line 65 – col. 7, line 2. Therefore, Seely does not teach or suggest the feature of independent claims 1 and 6 (and the claims respectively depending therefrom) that "**first-axis conductor cells and the second-axis conductor cells consist of a transparent conductive material**."

The secondary reference relied upon by the examiner, Hsu, discloses a transparent capacitive sensing system. Hsu, Abstract. To achieve transparency of the visible portion of the sensor array, Hsu's horizontal traces 64 and vertical traces 70 are made of a transparent material. Hsu, Figs. 5A-5B; col. 6, line 40, lines 44-48. To even further improve transparency, Hsu enlarges the vertical traces (diamonds 72) to the size of the spaces between X traces 66 so that sensor 36 appears to have a single uniform layer of transparent conductive material. Hsu, Fig. 5C; col. 7, lines 10-13. Hsu further notes that only non-visible portions of the sensor can be optionally be drawn with an opaque conductor such as silver ink and conductive carbon ink for better handling properties and lower resistance. Hsu, col. 4, lines 31-35.

In contrast, the primary reference Seely teaches away from this critical transparency requirement of Hsu's capacitive sensing system. As shown in Figs. 8A, 8B, and 9, Seely's printed circuit board 62 and the electrode traces 68 and 69 that are apparently on the visible portions of Seely's touchpad are made of copper that is not transparent. Seely, col. 2, lines 55-61, col. 6, line 65- col. 7, line 8.

The Federal Circuit Court of Appeals has made clear that, in the context of obviousness, if a proposed modification would render the prior art invention being modified **unsatisfactory for its intended purpose**, then there is no suggestion or motivation to make the proposed modification. *In re Gordon*, 733 F.2d 900, 221 USPQ 1125 (Fed. Cir. 1984). MPEP § 2143.01(V). Here, the Examiner's suggestion to modify Seely's touchpad by using Hsu's transparent conductive material yields unsatisfactory result for its intended use of Seely's touchpad that is made of inexpensive, easy to apply printed circuit board screening processes. Seely, col. 1, lines 6-9, col. 5, lines 60-61, col. 6, lines 4-8, lines 16-24, lines 55-59.

Furthermore, Seely's inventors would have known of the general use of transparent material for electrode traces and interconnections at the time the Seely application was filed in July 1998, but instead decided to use a less expensive fabrication processes using non-transparent metallic layer and carbon ink for the intended benefits as discussed above. See Seely, col. 1, lines 7-9.

The Examiner is further noted that:

> a patent [claim] composed of several elements is not proved obvious merely by demonstrating that each of its elements was, independently, known in the prior art. Although common sense directs one to look with care at a patent application that claims as innovation the combination of two known devices according to their established functions, it can be important to identify a reason that would have prompted a person of ordinary skill in the relevant field to combine the elements in the way the claimed new invention does.

KSR Int'l. Co. v. Teleflex, Inc., 550 U.S. at 418 (2007).

The Examiner has not provided a cogent reason to replace Seely's non-transparent metallic traces or carbon ink traces with Hsu's transparent conductive materials, nor has the Examiner established that a person of ordinary skill in the art would reasonably expect to obtain the benefits of Seely's inexpensive printed circuit and carbon ink patterning processes at the cost of reduced conductivity and loss of transparency by replacing the carbon ink traces with Hsu's conductive materials. See Seely, col. 6, lines 18-25.

For these reasons, Applicant respectfully submits that there is no suggestion or motivation to combine Seely and Hsu to teach or suggest that "**first-axis conductor cells and the second-axis conductor cells consist of <u>a transparent conductive material</u>**," as previously submitted claims 2 and 7, and now independent claims 1 and 6, recite. Moreover, it is only by having first considered Applicant's specification and claims that the Examiner was able to use hindsight to reconstruct the prior art and formulate the present rejection, which is improper in light of the applicable authorities. MPEP § 2145 (X)(A). Applicant respectfully submits that previously presented claims 2-4 and 7-9 (and now claims 1-4, 6-9) are patentable under 35 U.S.C. §103(a) over Seely in view of Hsu.

Hsu further discloses a conventional four-layer design including respective substrates 62 for X-axis traces 64 and substrates 68 for Y-axis traces 70 separated by an insulator 74. Hsu, Figure 5D; col. 7, lines 29-33. In this four-layer design, X-axis traces are formed on the substrate 62 while the Y-axis traces are formed on the different substrate 68. Hsu, col. 7, lines 4-6. Consequently, the X-axis sensor traces and Y-axis sensor traces are <u>formed on different substrates</u>. Hsu, Figures 5D, 6-9.

Hsu further disclose an insulator layer 74 that separates X conductive traces 64 from Y conductive traces 70. Hsu, FIG. 5D; col. 7, lines 29-33. Hsu's system requires electrical shielding by the insulator 74 to isolate sensor traces from electrical noise. Hsu, col. 7, lines 48-49. If Hsu's four-layer design were modified to arrange layers of first-axis traces and second-axis traces on the same surface of the substrate, as claim 1 recites, insulator layer 74 that separates X conductive traces 64 and Y conductive traces 70 needs to be removed. This is highly undesirable according to Hsu because the intended purpose of insulator layer 70 is to isolate sensor traces from electrical noise. *Id.*

In contrast, Seely places the X and Y electrodes (68 and 69) on the same substrate without requiring an insulator therebetween. Instead of an insulator between X and Y traces, Seely uses solder mask pattern to insulate the horizontal wires or traces 69 underneath the vertically-running carbon ink traces. Seely, FIG. 7; col. 6, lines 43-54. The solder mask pattern allows to place the X and Y electrodes on the same substrate. *Id.*

However, the elimination of Hsu's insulator layer to place the X and Y traces on the same substrates as Seely requires would make the Hsu's four-layer design unsatisfactory because the intended purpose of electrical separation between the underlying X and Y traces would be destroyed. Similarly, Hsu's X interconnects cannot be placed on the same substrate as Y traces. Because the proposed modification would render the prior art invention being modified **unsatisfactory for its intended purpose**, then there is no suggestion or motivation to make the proposed modification. *In re Gordon*, 733 F.2d 900, 221 USPQ 1125 (Fed. Cir. 1984). MPEP § 2143.01 (V).

For these additional reasons, Applicant respectfully submits that Seely and Hsu cannot be combined without the benefit of an improper hindsight reconstruction to teach or suggest the claimed features of rejected claims 2 and 7 (now claims 1 and 6). MPEP § 2145 (X)(A). Therefore, Applicant respectfully submits that claims 1 and 6 and claims 2-4 and 7-9 that depend from claims 1 and 6 are patentable under 35 U.S.C. §103(a) over Seely in view of Hsu.

B. Claims 3 and 8

Regarding claims 3 and 8, the Examiner stated that Seely fails to expressly teach but Hsu does teach the first-axis conduction lines and the second-axis conduction lines consisting of a transparent conductive material. 06/25/10 Office Action, pp. 6, 8. Applicant respectfully traverses this ground of rejection for the following reasons.

Seely discloses that the horizontally-aligned electrodes are connected together by wires (horizontal interconnections) that run the entire width of the pad. Seely, col. 4, lines 63-66. The floating electrodes interspersed between the horizontal electrodes form the vertical array by connecting them without interference with the horizontal interconnection. Seely, col. 5, lines 48-56. For these vertical interconnections, Seely uses a screen-printed layer of <u>carbon ink loaded with graphite</u>. Seely, col. 5, lines 56-59; col. 6, lines 19-21. It is well known in the art that such carbon ink loaded with graphite is <u>not</u> transparent. For example, Seely discloses Electrador 5500 series carbon conductor paste made by the Electra Polymer and Chemicals, America Corp. of Orange, California, as a material for such screen-printed layer of ink. Seely, col. 5, line 65 – col. 6, line 3. As disclosed in the Material Safety Data Sheet ("Data Sheet" hereinafter), the Electrador 5500 series carbon conductor paste is black in color, and thus <u>not transparent</u>. Data Sheet, p. 1, section 3. Data Sheet is attached herewith as **Appendix B** for the Examiner's convenient reference.

In contrast, claims 3 and 8 recite "**the second-axis conduction lines consist of <u>a transparent conductive material</u>.**" As discussed, Seely's layer of carbon ink for connecting vertical electrode traces is <u>not transparent</u>, therefore Seely does not teach or suggest this feature of claims 3 and 8.

Seely further discloses that:

> screen-printed carbon ink is a <u>standard, inexpensive process step</u> used in high-volume [printed] circuit board manufacturing. Carbon

> ink is the most commonly-used variety of conductive ink, though any alternate type of conductive ink or paste such as silver ink would serve equally well for the purposes herein disclosed. Conductive inks compatible with printed circuit board screening processes can be obtained from a variety of vendors …

Seely, col. 5, lines 60-67.

> A lower-cost alternative to gold-plating is screen-printed carbon ink. Typically, exposed metal traces are "painted" with a selectively-applied (screen-printed) layer of ink loaded with graphite.

Seely, col. 6, lines 16-17.

From the foregoing, Seely uses the carbon ink patterning for connecting vertical traces due to its lower manufacturing cost and ease of the process even if there are other manufacturing processes that provide better quality of interconnection such as resistance to oxidation and corrosion as well as better conductivity. This is evidenced by Seely's own disclosure that states:

> [t]he ink is somewhat conductive, so affords electrical connection. The ink is non-metallic, so it resists oxidation and corrosion. For example, carbon-ink printing is commonly used to form inexpensive arrays of switch contacts on printed circuit boards used in TV remote controls.

Seely, col. 6, lines 18-25.

Seely further discloses that:

> Carbon and other types of conductive links are also widely used in the PC board industry to provide a supplemental layer of interconnections, thus eliminating need for jumpers and other supplemental interconnect devices. This is the same purpose for which the conductive ink is used in the present invention.

Seely, col. 6, lines 26-31, emphasis added.

Based on this, the Examiner incorrectly suggests that Hsu's transparent conductive material can be used for Seely's carbon ink traces. 06/25/10 Office Action, pp. 6-8. In fact, Seely suggests the opposite and use of conductive carbon ink for the purpose of eliminating other types of interconnections including Hsu's vertical interconnect. See above.

The Examiner is further noted that:

> a patent [claim] composed of several elements is not proved obvious merely by demonstrating that each of its elements was, independently, known in the prior art. Although common sense directs one to look with care at a patent application that claims as innovation the combination of two known devices according to their established functions, it can be important to identify a reason that would have prompted a person of ordinary skill in the relevant field to combine the elements in the way the claimed new invention does.

KSR Int'l. Co. v. Teleflex, Inc., 550 U.S. at 418 (2007).

In rejecting claims 2 and 7 (now claims 1 and 6) and claims 3 and 8, the Examiner has not provided a cogent reason to replace Seely's non-transparent metallic traces or carbon ink traces with Hsu's transparent conductive materials, nor has the Examiner established that a person of ordinary skill in the art would reasonably expect to obtain the benefits of Seely's inexpensive printed circuit and carbon ink patterning processes at the cost of reduced conductivity and loss of transparency by replacing the carbon ink traces with Hsu's conductive materials. See Seely, col. 6, lines 18-25.

For these additional reasons, Applicant respectfully submits that Seely and Hsu cannot be combined without the benefit of an improper hindsight reconstruction to teach or suggest the claimed features of rejected claims 3 and 8. Therefore, Applicant respectfully submits that claims 3 and 8 are patentable under 35 U.S.C. §103(a) over Seely in view of Hsu.

C. Claims 5 and 10

The Examiner rejected claims 5 and 10 under 35 U.S.C. §103(a) as being unpatentable over Seely in view of Mulligan. 06/25/10 Office Action, p. 9.

For the reasons set forth regarding claims 1 and 6, and the dependency therefrom, claims 5 and 10 are also patentable under 35 U.S.C. §103(a) over Seely.

Mulligan does not cure the above-noted deficiencies of Seely. Similar to Hsu's four-layer design, Mulligan's touch-sensitive screen separates the first sensor layer 240 from the second sensor layer 260 by an intermediate dielectric layer 250. Mulligan, Figure 2; par. [0024]. In a different embodiment, Mulligan also discloses separate sensor layers 501 and 502. Mulligan, Figure 5, par. [0038].

From the foregoing, Seely and Mulligan cannot be combined to teach or suggest the features of claims 5 and 10. Therefore, Applicant respectfully submits that claims 5 and 10 are patentable under 35 U.S.C. §103(a) over Seely in view of Mulligan.

CONCLUSION

Applicant respectfully submits that it has made a patentable contribution to the art. Reconsideration of this application in view of the foregoing remarks and withdrawal of the Examiner's rejections are respectfully requested.

The Examiner is invited to call Applicant's undersigned representative if doing so would expedite prosecution.

Date: September 20, 2010

Respectfully submitted,

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22271-4002/260951304.7

Appendix A

SECOND EDITION

COMPREHENSIVE DICTIONARY OF ELECTRICAL ENGINEERING

EDITOR-IN-CHIEF
Phillip A. Laplante

Taylor & Francis
Taylor & Francis Group
Boca Raton London New York Singapore

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principal point the point at which the optical axis of the lens in a camera meets the image plane; also, the corresponding point in the image.

principle of locality *See* locality. *See also* sequential locality.

principle of superposition in a linear electrical network, the voltage or current in any element resulting from several sources acting together is the sum of the voltages or currents from each source acting alone.

printed circuit board (PCB) a substrate made from insulating material that has one or more sandwiched metallic conductor layers applied that are etched to form interconnecting traces useful for interconnecting components.

printer an output device for printing results on paper.

prior statistics the statistics of a random quantity (scalar, vector, process etc.) before any experimental or measured knowledge of the quantity is incorporated. *See* posterior statistics.

prioritization coding a coding scheme whereby the position of the symbol in the data steam indicates its weight.

priority encoder an encoder with the additional property that if several inputs are asserted simultaneously, the output number indicates the numerically highest input that is asserted.

prism | air | metal (PAM) system the two-interface model of an ATR (attenuated total reflection) system comprised of prism | air | metal. Commonly known as PAM system.

prismatic joint a joint characterized by a translation that is the relative displacement between two successive links. This translation is sometimes called the joint offset.

private key cryptography also known as secret key cryptography. In such a cryptographic system, the secret encryption key is only known to the transmitter and the receiver for whom the message is intended. The secret key is used both for the encryption of the plaintext and for the decryption of the ciphertext. *See also* public key cryptography.

privileged instruction an instruction that can be executed only when the CPU is in privileged mode.

privileged mode a mode of execution of machine instructions in the CPU in which certain special instructions can be executed or data accessed that would otherwise be prohibited. *See also* user mode.

PRMA *See* packet reservation multiple access.

probabilistic metric space a generalization of the notion of metric spaces onto the uncertain systems by replacing a metric on a given set S by a distance distribution function F, and a triangle inequality by a generalized inequality defined by triangle function τ. A distance distribution functions between two elements $p, q \in S$ is defined as a real function F_{pq} whose value $F_{pq}(x)$ for any real number x is interpreted as the probability, the membership function, or the grade of membership (depending on the type of the uncertainty model) that the distance between p and q is less than x. The simplest distance distribution function is given by the unit step (Heaviside) function $\mathbf{1}$ as follows:

$$F_{pq}(x) = \mathbf{1}(x - d(p, q))$$

where d is a standard metric. Then a probabilistic metric space reduces to the standard metric space. More precisely, a probabilistic metric space (PMS) is defined as a triple (S, F, τ) endowed

with the following p

$F_{pq}(x) =$

1

$F_{pr} \geq$

for all $p, q, r \in S$.
function and the trian
model of uncertainty
of the standard oper

probabilistic neura
loosely to networks
probabilistic behavi
to a type of network
fication based upon
estimation of probab

probability density
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comes of an experi
discrete outcomes, t
ative frequency hist
continuous outcome
relative frequency h
bin widths are refine
derneath a PDF mus
(2) the derivative
function (when the
mally, for a random
A, the probability de

$\Pr(x \in A$

See also cumulative

procedure a self-
signed to be re-execu
main program or anc
instruction, return to

procedure call in
cution of a machine-
execution of the prog
following the locatio

Appendix B

MATERIAL SAFETY DATA SHEET

Electra Polymers & Chemicals Ltd
Roughway Mill, Dunks Green,
Tonbridge. Kent.
Tel +44 01732 811 118 : Fax +44 01732 811 119

SECTION 1 PRODUCT IDENTIFICATION

TRADE NAME: *ELECTRA[D] D'OR* 5500 CARBON CONDUCTOR PASTE

CHEMICAL FAMILY: PIGMENTED SOLUTION OF RESIN IN ORGANIC SOLVENT

FORMULA: N/A

NFPA RATING: HEALTH = 2 FLAMMABILITY = 1 REACTIVITY = 1 OTHER = NONE

SECTION 2 HAZARDOUS INGREDIENTS

Electra Polymers & Chemicals have identified the following chemical(s) as hazardous:

INGREDIENT	WT%	TLV
Phenolic resin	<40%	NE
Carbitol	<30%	NE
Graphite	<20%	$10mg/m^3$
Carbon black	<7%	$3.5mg/m^3$
Methanol	<8%	200ppm

SECTION 3 PHYSICAL DATA

SPECIFIC GRAVITY:	>1	**FORM:**	paste
FREEZING POINT:	n/a	**pH:**	N/A
SOLUBILITY IN WATER:	Partial	**FLASH POINT:**	>160 deg F(PMCC)
COLOR:	Black	**VAPOR PRESSURE:**	<5 mm Hg @ 68 deg F

NOTE:

SECTION 4 FIRE & EXPLOSION DATA

FLASH POINT: >160 deg F

EXTINGUISHING MEDIA: Use dry chemical, foam or CO_2 extinguishers. Wear self contained breathing apparatus and proper protective clothing.

UNUSUAL FIRE AND EXPLOSION HAZARDS: Thermal degradation products may be formed which are toxic. Closed containers may rupture violently.

MATERIAL SAFETY DATA SHEET

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SECTION 5 FIRST AID DATA

EYES: Irrigate thoroughly with large quantities of water. Seek immediate medical attention.

SKIN: Remove all contaminated clothing. Wash immediately with soap and water. Where irritation develops, seek medical advice. Contaminated clothing should be dry cleaned before reuse.

INGESTION: Obtain medical advice immediately. It is not recommended that vomiting be induced except on medical advice.

INHALATION: Remove from exposure. Keep warm and at rest. Where respiratory distress occurs, give oxygen and obtain medical attention immediately.

SECTION 6 HEALTH EFFECTS DATA

EYES: May cause irritation if product gets into eyes

SKIN: May cause irritation and defatting of the skin leading to possible dermatitis. May cause skin sensitization and/or allergic skin reactions. Solvents may be absorbed through unbroken skin.

INGESTION: May cause irritation to mouth nose and digestive tract. Methanol can cause blindness and, in extreme cases, death.

INHALATION: Heating can generate vapors that may cause irritation of nose, throat and air passages, nausea and headaches. Inhalation risk at room temperature is low owing to the low volatility of the solvents in this product.

SECTION 7 PERSONAL PROTECTIVE DATA

RESPIRATORY PROTECTION: Wear a correctly fitted, NIOSH approved, respirator or industrial type canister mask in enclosed areas with poor or no ventilation, or where TLV levels are likely to be exceeded.

VENTILATION: Good general ventilation is recommended. Local exhaust ventilation is recommended where vapours are likely to be released.

PROTECTIVE EQUIPMENT: Wear goggles, gloves, and suitable protective clothing if splashing is likely.

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SECTION 8 TOXICOLOGY DATA

TOXICITY STUDIES: Toxicity studies have not been carried out on this material. Toxicity information available for the products listed in section 2 is given below.

ACUTE ORAL TOXICITY: N/A

ACUTE DERMAL TOXICITY: N/A

ACUTE RESPIRATORY TOXICITY: N/A

TOXICITY HAZARD REVIEW (THR): N/A

SECTION 9 REACTIVITY DATA

INCOMPATIBILITY: Avoid peroxides and strong oxidizing agents, acids and bases.

HAZARD DECOMPOSITION PRODUCTS: Thermal degradation products may be formed which are acidic, acrid or toxic.

STABILITY: Stable

CONDITIONS TO AVOID: Storage in open containers, heat and naked flames.

HAZARDOUS POLYMERIZATION: Negligible

SECTION 10 SPILL AND DISPOSAL DATA

SPILL CONTROL AND RECOVERY: Extinguish all sources of ignition. Try to prevent spills entering drains or water courses. Absorb spills in earth, sand or other absorbent material and wash area with soapy water.

DISPOSAL: Dispose of in accordance with Federal, State and local regulations.

SECTION 11 GENERAL STORAGE DATA

Material should be stored in the original containers in a cool, dry place. Avoid subjecting containers to temperatures below 5 deg C because of the risk of splitting.

Electra Polymers & Chemicals Ltd
Roughway Mill, Dunks Green,
Tonbridge. Kent.
Tel +44 01732 811 118 : Fax +44 01732 811 119

SECTION 12 TRANSPORTATION DATA

DOT PROPER SHIPPING NAME:	Non regulated
HAZARD CLASS:	n/a
UN/NA #:	n/a
IMO/IATA:	n/a
HAZARD CLASS:	n/a

SECTION 13 REGULATORY DATA

TOXIC SUBSTANCES CONTROL ACT (TSCA):	The chemical ingredients in this product are listed on the TSCA Inventory.
MASSACHUSSETS TOXIC SUBSTANCES LIST:	This product does not contain ingredients listed on the Massachussets Toxic Substances List, besides the substances listed on the HAZARDOUS INGREDIENTS Section.
CALIFORNIA PROPOSITION 65	This contains chemicals listed as being known to the State of California to cause cancer or birth defects or other reproductive harm, under the California Safe Drinking Water & Toxic Enforcement Act of 1986 (Proposition 65).
Title III of SARA	This product contains ingredients listed under Title III of SARA (the Superfund Amendments and Reauthorization Act of 1986).

SECTION 14 USER NOTIFICATION

To the best of our knowledge the information contained herein is correct. All chemicals present unknown health hazards and should be used with caution. Although certain hazards are described herein, we cannot guarantee that these are the only hazards which exist. Final determination of suitability of the chemical is the sole responsibility of the user. Users of any chemical should satisfy themselves that the conditions and methods of use assure that the chemical is used safely. NO REPRESENTATIONS OR WARRANTIES, EITHER EXPRESSED OR IMPLIED OF MERCHANTABILITY, FITNESS FOR A PARTICULAR PURPOSE OR ANY OTHER NATURE ARE MADE HERE UNDER WITH RESPECT TO THE INFORMATION CONTAINED HEREIN OR THE CHEMICAL TO WHICH THE INFORMATION REFERS.

Electronic Patent Application Fee Transmittal

Application Number:	11842747
Filing Date:	21-Aug-2007
Title of Invention:	CONDUCTOR PATTERN STRUCTURE OF CAPACITIVE TOUCH PANEL
First Named Inventor/Applicant Name:	Ching-Yang Chang
Filer:	Sanjeet Kumar Dutta/Susan Principe
Attorney Docket Number:	22271.4002

Filed as Small Entity

Utility under 35 USC 111(a) Filing Fees

Description	Fee Code	Quantity	Amount	Sub-Total in USD($)
Basic Filing:				
Pages:				
Claims:				
Claims in excess of 20	2202	25	26	650
Independent claims in excess of 3	2201	1	110	110
Miscellaneous-Filing:				
Petition:				
Patent-Appeals-and-Interference:				
Post-Allowance-and-Post-Issuance:				

Description	Fee Code	Quantity	Amount	Sub-Total in USD($)
Extension-of-Time:				
Miscellaneous:				
		Total in USD ($)		**760**

Electronic Acknowledgement Receipt

EFS ID:	8456972
Application Number:	11842747
International Application Number:	
Confirmation Number:	3897
Title of Invention:	CONDUCTOR PATTERN STRUCTURE OF CAPACITIVE TOUCH PANEL
First Named Inventor/Applicant Name:	Ching-Yang Chang
Customer Number:	34313
Filer:	Sanjeet Kumar Dutta/Susan Principe
Filer Authorized By:	Sanjeet Kumar Dutta
Attorney Docket Number:	22271.4002
Receipt Date:	20-SEP-2010
Filing Date:	21-AUG-2007
Time Stamp:	18:06:11
Application Type:	Utility under 35 USC 111(a)

Payment information:

Submitted with Payment	yes
Payment Type	Deposit Account
Payment was successfully received in RAM	$760
RAM confirmation Number	5016
Deposit Account	150665
Authorized User	

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 C.F.R. Section 1.19 (Document supply fees)

Charge any Additional Fees required under 37 C.F.R. Section 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		4002_Amend_9_20_2010.pdf	4953052 5b7a80b5c739b4490485eb6c7a3fe24e8eef1031	yes	30

Multipart Description/PDF files in .zip description

Document Description	Start	End
Miscellaneous Incoming Letter	1	2
Amendment/Req. Reconsideration-After Non-Final Reject	3	30

Warnings:

Information:

Document Number	Document Description	File Name	File Size(Bytes)/ Message Digest	Multi Part /.zip	Pages (if appl.)
2	Fee Worksheet (PTO-875)	fee-info.pdf	31751 dd6b9152819c40ece6615169f720d3f8305b5a3c	no	2

Warnings:

Information:

Total Files Size (in bytes): 4984803

This Acknowledgement Receipt evidences receipt on the noted date by the USPTO of the indicated documents, characterized by the applicant, and including page counts, where applicable. It serves as evidence of receipt similar to a Post Card, as described in MPEP 503.

<u>New Applications Under 35 U.S.C. 111</u>
If a new application is being filed and the application includes the necessary components for a filing date (see 37 CFR 1.53(b)-(d) and MPEP 506), a Filing Receipt (37 CFR 1.54) will be issued in due course and the date shown on this Acknowledgement Receipt will establish the filing date of the application.

<u>National Stage of an International Application under 35 U.S.C. 371</u>
If a timely submission to enter the national stage of an international application is compliant with the conditions of 35 U.S.C. 371 and other applicable requirements a Form PCT/DO/EO/903 indicating acceptance of the application as a national stage submission under 35 U.S.C. 371 will be issued in addition to the Filing Receipt, in due course.

<u>New International Application Filed with the USPTO as a Receiving Office</u>
If a new international application is being filed and the international application includes the necessary components for an international filing date (see PCT Article 11 and MPEP 1810), a Notification of the International Application Number and of the International Filing Date (Form PCT/RO/105) will be issued in due course, subject to prescriptions concerning national security, and the date shown on this Acknowledgement Receipt will establish the international filing date of the application.

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Appl. No.	:	11/842,747	Confirmation No.: 3897
Applicants	:	Ching-Yang Chang, *et al.*	
Filing Date	:	August 21, 2007	
Title	:	Conductor Pattern Structure Of Capacitive Touch Panel	
Group Art Unit	:	2629	
Examiner	:	Hicks, Charles V.	
Docket No.	:	22271-4002	
Customer No.	:	34313	

Commissioner For Patents
Mail Stop Missing Parts
P.O. Box 1450
Alexandria, VA 22313-1450

Dear Sir/Madam:

In response to the Office Action dated June 25, 2010, transmitted herewith is an Amendment and Response for the above-identified application.

ADDITIONAL PAPERS ENCLOSED:

☐ Information Disclosure Statement

The fees for claims (37 CFR § 1.16(b)-(d)) have been calculated as shown below

FEES FOR CLAIMS:

☒ Applicant claims small entity status pursuant to 37 CFR 1.27.

☒ Charge Orrick, Herrington & Sutcliffe LLP's Deposit Account No. **15-0665** in the amount of **$760.00** to cover any fees as shown below:

1 Additional Independent Claim @ $110 per claim	110.00
25 Additional Dependent Claims @ $26 per claim	650.00
Total	$760.00

☒ The Commissioner is authorized to charge Orrick, Herrington & Sutcliffe LLP's Deposit Account No. **15-0665** for any fees required under 37 CFR §§ 1.16 and 1.17 that are not covered, in whole or in part, by a check enclosed herewith and to credit any overpayments to said Deposit Account **15-0665**.

Respectfully submitted,

Orrick, Herrington & Sutcliffe LLP

Dated: September 20, 2010

By:
Hanbum Cho
Reg. No. 58,993

Four Park Plaza, Suite 1600
Irvine, CA 92614-2558
(650) 614-7647
(650) 614-7401 (facsimile)

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Appl. No.	:	11/842,747	Confirmation No.:	3897
Applicants	:	Ching-Yang Chang, *et al.*		
Filing Date	:	August 21, 2007		
Title	:	Conductor Pattern Structure Of Capacitive Touch Panel		
Group Art Unit	:	2629		
Examiner	:	Hicks, Charles V.		
Docket No.	:	22271-4002		
Customer No.	:	34313		

Commissioner For Patents
Mail Stop Missing Parts
P.O. Box 1450
Alexandria, VA 22313-1450

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Respectfully submitted,

Orrick, Herrington & Sutcliffe LLP

Dated: September 20, 2010

By: [signature]
Hanbum Cho
Reg. No. 58,993

Four Park Plaza, Suite 1600
Irvine, CA 92614-2558
(650) 614-7647
(650) 614-7401 (facsimile)

AMENDMENTS TO THE CLAIMS

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

1. (Currently amended) A conductor pattern structure of a capacitive touch panel~~, which is adapted to~~ formed on a surface of a substrate, the ~~touch-control~~ conductor pattern structure comprising:

a plurality of first-axis conductor assemblies, each first-axis conductor assembly comprising a plurality of first-axis conductor cells arranged on the ~~substrate~~ surface of the substrate along a first axis in a substantially equally-spaced manner, a disposition zone being delimited between adjacent ones of the first-axis conductor assemblies and between adjacent ones of the first-axis conductor cells;

a plurality of first-axis conduction lines respectively connecting between adjacent ones of the first-axis conductor cells of each first-axis conductor assembly so that the first-axis conductor cells of each respective first-axis conductor assembly are electrically connected together;

a plurality of insulation layers each covering a surface of each first-axis conduction line;

a plurality of second-axis conductor assemblies, each second-axis conductor assembly comprising a plurality of second-axis conductor cells arranged on the ~~substrate~~ surface of the substrate along a second axis in a substantially equally-spaced manner, each second-axis conductor cell being set in each disposition zone; ~~and~~

a plurality of second-axis conduction lines respectively connecting between adjacent ones of the second-axis conductor cells of each second-axis conductor assembly so that

the second-axis conductor cells of each respective second-axis conductor assembly are electrically connected together, the second-axis conduction line being extended across a surface of the insulation layer of the respective first-axis conduction line,

wherein first-axis conductor cells and the second-axis conductor cells consist of a transparent conductive material.

2. (Currently amended) The conductor pattern structure as claimed in claim 1, wherein the first-axis ~~conductor cells and the second-axis conductor cells~~ conduction lines consist of a transparent conductive material.

3. (Currently amended) The conductor pattern structure as claimed in claim 1, wherein ~~the first-axis conduction lines and~~ the second-axis conduction lines consist of a transparent conductive material.

4. (Original) The conductor pattern structure as claimed in claim 1, wherein the insulation layer consists of a transparent insulation material.

5. (Original) The conductor pattern structure as claimed in claim 1, wherein the first-axis conductor cells and the second-axis conductor cells have a contour of hexagonal shape.

6. (Currently amended) A conductor pattern structure of a capacitive touch panel ~~adapted to~~ formed on a surface of a substrate, the ~~touch-control~~ conductor pattern structure comprising:

at least two adjacent first-axis conductor cells; and

at least two adjacent second-axis conductor cells,

wherein the adjacent first-axis conductor cells are connected by a first-axis conduction line provided therebetween, ~~characterized in that~~

wherein an insulation layer is formed on a surface of the first-axis conduction line and a second-axis conduction line extends across a surface of the insulation layer to connect between the adjacent second-axis conductor cells, and

wherein first-axis conductor cells and the second-axis conductor cells consist of a transparent conductive material.

7. (Currently amended) The conductor pattern structure as claimed in claim 6, wherein the first-axis ~~conductor cells and the second-axis conductor cells~~ conduction lines consist of a transparent conductive material.

8. (Currently amended) The conductor pattern structure as claimed in claim 6, wherein ~~the first-axis conduction line and~~ the second-axis conduction lines consist of a transparent conductive material.

9. (Original) The conductor pattern structure as claimed in claim 6, wherein the insulation layer consists of a transparent insulation material.

10. (Original) The conductor pattern structure as claimed in claim 6, wherein the first-axis conductor cells and the second-axis conductor cells have a contour of hexagonal shape.

11. (New) The conductor pattern structure as claimed in claim 1 further comprises a plurality of signal transmission lines formed on the surface of the substrate, each signal transmission line respectively connecting each first-axis conductor assembly and each second-axis conductor assembly.

12. (New) The conductor pattern structure as claimed in claim 11, wherein the first-axis conduction lines consist of a transparent conductive material.

13. (New) The conductor pattern structure as claimed in claim 11, wherein the second-axis conduction lines consist of a transparent conductive material.

14. (New) The conductor pattern structure as claimed in claim 11, wherein the insulation layer consists of a transparent insulation material.

15. (New) The conductor pattern structure as claimed in claim 11, wherein the first-axis conductor cells and the second-axis conductor cells have a contour of hexagonal shape.

16. (New) The conductor pattern structure as claimed in claim 11, wherein the transparent conductive material is Indium Tin Oxide (ITO).

17. (New) The conductor pattern structure as claimed in claim 11, wherein a capacitance between a first cell of the plurality of first-axis conductor cells and a second cell of the plurality of second-axis conductor cells is measured to detect a position of touch.

18. (New) The conductor pattern structure as claimed in claim 17, wherein the first-axis conduction lines consist of a transparent conductive material.

19. (New) The conductor pattern structure as claimed in claim 17, wherein the second-axis conduction lines consist of a transparent conductive material.

20. (New) The conductor pattern structure as claimed in claim 17, wherein the insulation layer consists of a transparent insulation material.

21. (New) The conductor pattern structure as claimed in claim 17, wherein the first-axis conductor cells and the second-axis conductor cells have a contour of hexagonal shape.

22. (New) The conductor pattern structure as claimed in claim 17, wherein each second-axis conduction line terminates on the edge of each second-axis conductor cell to the adjacent second-axis conductor cells.

23. (New) The conductor pattern structure as claimed in claim 17, wherein the transparent conductive material is Indium Tin Oxide (ITO).

24. (New) The conductor pattern structure as claimed in claim 1, wherein each second-axis conduction line terminates on the edge of each second-axis conductor cell to the adjacent second-axis conductor cells.

25. (New) The conductor pattern structure as claimed in claim 1, wherein a capacitance between a first cell of the plurality of first-axis conductor cells and a second cell of the plurality of second-axis conductor cells is measured to detect a position of touch.

26. (New) The conductor pattern structure as claimed in claim 25, wherein the first-axis conduction lines consist of a transparent conductive material.

27. (New) The conductor pattern structure as claimed in claim 25, wherein the second-axis conduction lines consist of a transparent conductive material.

28. (New) The conductor pattern structure as claimed in claim 25, wherein the insulation layer consists of a transparent insulation material.

29. (New) The conductor pattern structure as claimed in claim 25, wherein the first-axis conductor cells and the second-axis conductor cells have a contour of hexagonal shape.

30. (New) The conductor pattern structure as claimed in claim 25, wherein the transparent conductive material is Indium Tin Oxide (ITO).

31. (New) The conductor pattern structure as claimed in claim 1, wherein the transparent conductive material is Indium Tin Oxide (ITO).

32. (New) A method of constructing a conductor pattern structure of a capacitive touch panel, the method comprising:

forming a plurality of first-axis conductor cells on a surface of a substrate arranged along a first axis in a substantially equally-spaced manner, forming a plurality of second-axis conductor cells on the surface of the substrate arranged along a second axis in a substantially equally-spaced manner;

electrically connecting adjacent ones of the first-axis conductor cells along the first-axis using a plurality of first-axis conduction lines to form a plurality of first-axis conductor assemblies, wherein each second-axis conductor cell is set in each disposition zone being delimited between adjacent ones of the first-axis conductor assemblies and between adjacent ones of the first-axis conductor cells;

forming a plurality of insulation layers covering a surface of each first-axis conduction line; and

electrically connecting adjacent ones of the second-axis conductor cells along the second-axis using a plurality of second-axis conduction lines to form a plurality of second-axis conductor assemblies, each of the first-axis conductor cells and the second-axis conductor cells consisting of a transparent conductive material.

33. (New) The method of claim 32, wherein the first-axis conductor cells, the second-axis conductor cells and the first-axis conduction lines are formed simultaneously.

34. (New) The method of claim 32 further comprising forming a plurality of signal transmission lines on the surface of the substrate, each signal transmission line respectively connecting each first-axis conductor assembly and each second-axis conductor assembly.

35. (New) The method of claim 32 further comprising measuring a capacitance between a first cell of the plurality of first-axis conductor cells and a second cell of the plurality of second-axis conductor cells to detect a position of touch.

36. (New) The method of claim 32, wherein the first-axis conduction lines consist of a transparent conductive material.

37. (New) The method of claim 32, wherein the second-axis conduction lines consist of a transparent conductive material.

38. (New) The method of claim 32, wherein the insulation layer consists of a transparent insulation material.

39. (New) The method of claim 32, wherein the first-axis conductor cells and the second-axis conductor cells have a contour of hexagonal shape.

40. (New) The method of claim 32, wherein each second-axis conduction line terminates on the edge of each second-axis conductor cell to the adjacent second-axis conductor cells.

41. (New) The method of claim 32, wherein the transparent conductive material is Indium Tin Oxide (ITO).

42. (New) A method of constructing a conductor pattern structure of a capacitive touch panel, the method comprising:

forming a plurality of first-axis conductor cells on a surface of a substrate arranged along a first axis in a substantially equally-spaced manner, wherein each first-axis conductor cell is separated by each disposition zone between adjacent ones of the first-axis conductor cells;

electrically connecting adjacent ones of the first-axis conductor cells along the first-axis using a plurality of first-axis conduction lines to form a plurality of first-axis conductor assemblies;

forming a plurality of insulation layers covering a surface of each first-axis conduction line;

forming a plurality of second-axis conductor cells in each disposition zone between adjacent ones of the first-axis conductor cells on the surface of the substrate arranged along a second axis in a substantially equally-spaced manner; and

electrically connecting adjacent ones of the second-axis conductor cells along the second-axis using a plurality of second-axis conduction lines to form a plurality of second-axis conductor assemblies, each of the first-axis conductor cells and the second-axis conductor cells consisting of a transparent conductive material.

43. (New) The method of claim 42 further comprising forming a plurality of signal transmission lines on the surface of the substrate, each signal transmission line respectively connecting each first-axis conductor assembly and each second-axis conductor assembly.

44. (New) The method of claim 42 further comprising measuring a capacitance between a first cell of the plurality of first-axis conductor cells and a second cell of the plurality of second-axis conductor cells to detect a position of touch.

45. (New) The method of claim 42, wherein the transparent conductive material is Indium Tin Oxide (ITO).

PTO/SB/06 (07-06)
Approved for use through 1/31/2007. OMB 0651-0032
U.S. Patent and Trademark Office; U.S. DEPARTMENT OF COMMERCE

PATENT APPLICATION FEE DETERMINATION RECORD
Substitute for Form PTO-875

Application or Docket Number	Filing Date	
11/842,747	08/21/2007	☐ To be Mailed

APPLICATION AS FILED – PART I

	(Column 1)	(Column 2)	SMALL ENTITY ☒		OR	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	
☐ SEARCH FEE (37 CFR 1.16(k), (i), or (m))	N/A	N/A	N/A			N/A	
☐ EXAMINATION FEE (37 CFR 1.16(o), (p), or (q))	N/A	N/A	N/A			N/A	
TOTAL CLAIMS (37 CFR 1.16(i))	minus 20 =	*	X $ =		OR	X $ =	
INDEPENDENT CLAIMS (37 CFR 1.16(h))	minus 3 =	*	X $ =			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 $250 ($125 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))							
			TOTAL			TOTAL	

* If the difference in column 1 is less than zero, enter "0" in column 2.

APPLICATION AS AMENDED – PART II

AMENDMENT	09/20/2010	(Column 1) CLAIMS REMAINING AFTER AMENDMENT		(Column 2) HIGHEST NUMBER PREVIOUSLY PAID FOR	(Column 3) PRESENT EXTRA	SMALL ENTITY RATE ($)	ADDITIONAL FEE ($)	OR	OTHER THAN SMALL ENTITY RATE ($)	ADDITIONAL FEE ($)
	Total (37 CFR 1.16(i))	* 45	Minus	** 20	= 25	X $26 =	650	OR	X $ =	
	Independent (37 CFR 1.16(h))	* 4	Minus	***3	= 1	X $110 =	110	OR	X $ =	
	☐ Application Size Fee (37 CFR 1.16(s))									
	☐ FIRST PRESENTATION OF MULTIPLE DEPENDENT CLAIM (37 CFR 1.16(j))							OR		
						TOTAL ADD'L FEE	760	OR	TOTAL ADD'L FEE	

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

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

Legal Instrument Examiner:
/DORIS ISAAC/

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Appl. No.	:	11/842,747	Confirmation No.:	3897
Applicants	:	Ching-Yang Chang, *et al.*		
Filing Date	:	August 21, 2007		
Title	:	Conductor Pattern Structure Of Capacitive Touch Panel		
Group Art Unit	:	2629		
Examiner	:	Hicks, Charles V.		
Docket No.	:	22271-4002		
Customer No.	:	34313		

Via: USPTO EFS Web
Commissioner For Patents
P.O. Box 1450
Alexandria, VA 22313-1450

TRANSMITTAL LETTER

Dear Sir:

On September 20, 2010, Applicant electronically filed an Amendment for the above-identified application containing additional claims. Applicant was a large entity at the time of filing the Amendment, however, claim fees were paid at the small entity rate. Applicant respectfully requests that the United States Patent and Trademark Office corrects Applicant's filing status and charges large entity claim fees as follows:

Large Entity Fees Due the US PTO for Amendment filed Sept. 20, 2010:

1 Independent Claim for Large Entity @ $220 per claim	$220.00
25 Dependent Claims for Large Entity @ $52 per claim	$1,300.00
Total Due for Large Entity	$1,520.00
Less: Fees Paid Sept. 20, 2010 – Small Entity	($760.00)

OHS West:260223094.1

Add'l Fees Due to US PTO for Amendment - Large Entity $760.00

Applicant respectfully requests that the United States Patent and Trademark Office charge $760.00 to said Deposit Account **15-0665** for additional fees due to change in entity status from small to large.

The Commissioner is authorized to charge Orrick, Herrington & Sutcliffe LLP's Deposit Account No. **15-0665** for any fees required under 37 CFR §§ 1.16 and 1.17 that are not covered, in whole or in part, by a check enclosed herewith and to credit any overpayments to said Deposit Account **15-0665**.

Respectfully submitted,

Orrick, Herrington & Sutcliffe LLP

Dated: September 28, 2010

By: [signature]
Hanbum Cho
Reg. No. 58,993

MAILING ADDRESS:
Orrick, Herrington & Sutcliffe LLP
IP Prosecution Department
4 Park Plaza, Suite 1600
Irvine, CA 92614-2558
Customer Number: 34313

Electronic Acknowledgement Receipt

EFS ID:	8517722
Application Number:	11842747
International Application Number:	
Confirmation Number:	3897
Title of Invention:	CONDUCTOR PATTERN STRUCTURE OF CAPACITIVE TOUCH PANEL
First Named Inventor/Applicant Name:	Ching-Yang Chang
Customer Number:	34313
Filer:	Sanjeet Kumar Dutta/Susan Principe
Filer Authorized By:	Sanjeet Kumar Dutta
Attorney Docket Number:	22271.4002
Receipt Date:	28-SEP-2010
Filing Date:	21-AUG-2007
Time Stamp:	17:15:17
Application Type:	Utility under 35 USC 111(a)

Payment information:

Submitted with Payment	no

File Listing:

Document Number	Document Description	File Name	File Size(Bytes)/ Message Digest	Multi Part /.zip	Pages (if appl.)
1	Transmittal Letter	4002SmtoLgEntityFees_9_28_2010.pdf	259314 59951883d6f8867a6e22877bcd2046cc40ecb4a7	no	2

Warnings:

Information:

Total Files Size (in bytes):	259314

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
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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
11/842,747	08/21/2007	Ching-Yang Chang	22271.4002	3897

34313 7590 10/08/2010
ORRICK, HERRINGTON & SUTCLIFFE, LLP
IP PROSECUTION DEPARTMENT
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EXAMINER	
HICKS, CHARLES V	

ART UNIT	PAPER NUMBER
2629	

MAIL DATE	DELIVERY MODE
10/08/2010	PAPER

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.

Interview Summary	Application No.	Applicant(s)	
	11/842,747	CHANG ET AL.	
	Examiner	Art Unit	
	Alexander S. Beck	2629	

All participants (applicant, applicant's representative, PTO personnel):

(1) *Alexander S. Beck and Charles V. Hicks*.

(2) *Robert M. Isackson (Reg. No. 31,110)*.

(3) *Alp Bayramoglu (CTO of Assignee)*.

(4) *Hanbum Cho (Reg. No. 58,993)*.

Date of Interview: *06 October 2010*.

Type: a)☐ Telephonic b)☐ Video Conference
c)☒ Personal [copy given to: 1)☒ applicant 2)☒ applicant's representative]

Exhibit shown or demonstration conducted: d)☒ Yes e)☐ No.
If Yes, brief description: *Sample DITO and SITO*.

Claim(s) discussed: *All pending*.

Identification of prior art discussed: *U.S. Patent No. 6,188,301 to Seely et al. and U.S. Patent No. 7,030,860 to Hsu et al*.

Agreement with respect to the claims f)☐ was reached. g)☐ was not reached. h)☒ N/A.

Substance of Interview including description of the general nature of what was agreed to if an agreement was reached, or any other comments: *Applicant and representatives discussed the fundamental differences between the instant application and the prior art of record. Applicant and representatives discussed proposed amendments to overcome the prior art of record pending further search and/or consideration by examiner*.

(A fuller description, if necessary, and a copy of the amendments which the examiner agreed would render the claims allowable, if available, must be attached. Also, where no copy of the amendments that would render the claims allowable is available, a summary thereof must be attached.)

THE FORMAL WRITTEN REPLY TO THE LAST OFFICE ACTION MUST INCLUDE THE SUBSTANCE OF THE INTERVIEW. (See MPEP Section 713.04). If a reply to the last Office action has already been filed, APPLICANT IS GIVEN A NON-EXTENDABLE PERIOD OF THE LONGER OF ONE MONTH OR THIRTY DAYS FROM THIS INTERVIEW DATE, OR THE MAILING DATE OF THIS INTERVIEW SUMMARY FORM, WHICHEVER IS LATER, TO FILE A STATEMENT OF THE SUBSTANCE OF THE INTERVIEW. See Summary of Record of Interview requirements on reverse side or on attached sheet.

/Alexander S. Beck/ Primary Examiner, Art Unit 2629	Dated: October 6, 2010

Summary of Record of Interview Requirements

Manual of Patent Examining Procedure (MPEP), Section 713.04, Substance of Interview Must be Made of Record
A complete written statement as to the substance of any face-to-face, video conference, or telephone interview with regard to an application must be made of record in the application whether or not an agreement with the examiner was reached at the interview.

Title 37 Code of Federal Regulations (CFR) § 1.133 Interviews
Paragraph (b)

In every instance where reconsideration is requested in view of an interview with an examiner, a complete written statement of the reasons presented at the interview as warranting favorable action must be filed by the applicant. An interview does not remove the necessity for reply to Office action as specified in §§ 1.111, 1.135. (35 U.S.C. 132)

37 CFR §1.2 Business to be transacted in writing.
All business with the Patent or Trademark Office should be transacted in writing. The personal attendance of applicants or their attorneys or agents at the Patent and Trademark Office is unnecessary. The action of the Patent and Trademark Office will be based exclusively on the written record in the Office. No attention will be paid to any alleged oral promise, stipulation, or understanding in relation to which there is disagreement or doubt.

The action of the Patent and Trademark Office cannot be based exclusively on the written record in the Office if that record is itself incomplete through the failure to record the substance of interviews.

It is the responsibility of the applicant or the attorney or agent to make the substance of an interview of record in the application file, unless the examiner indicates he or she will do so. It is the examiner's responsibility to see that such a record is made and to correct material inaccuracies which bear directly on the question of patentability.

Examiners must complete an Interview Summary Form for each interview held where a matter of substance has been discussed during the interview by checking the appropriate boxes and filling in the blanks. Discussions regarding only procedural matters, directed solely to restriction requirements for which interview recordation is otherwise provided for in Section 812.01 of the Manual of Patent Examining Procedure, or pointing out typographical errors or unreadable script in Office actions or the like, are excluded from the interview recordation procedures below. Where the substance of an interview is completely recorded in an Examiners Amendment, no separate Interview Summary Record is required.

The Interview Summary Form shall be given an appropriate Paper No., placed in the right hand portion of the file, and listed on the "Contents" section of the file wrapper. In a personal interview, a duplicate of the Form is given to the applicant (or attorney or agent) at the conclusion of the interview. In the case of a telephone or video-conference interview, the copy is mailed to the applicant's correspondence address either with or prior to the next official communication. If additional correspondence from the examiner is not likely before an allowance or if other circumstances dictate, the Form should be mailed promptly after the interview rather than with the next official communication.

The Form provides for recordation of the following information:
- Application Number (Series Code and Serial Number)
- Name of applicant
- Name of examiner
- Date of interview
- Type of interview (telephonic, video-conference, or personal)
- Name of participant(s) (applicant, attorney or agent, examiner, other PTO personnel, etc.)
- An indication whether or not an exhibit was shown or a demonstration conducted
- An identification of the specific prior art discussed
- An indication whether an agreement was reached and if so, a description of the general nature of the agreement (may be by attachment of a copy of amendments or claims agreed as being allowable). Note: Agreement as to allowability is tentative and does not restrict further action by the examiner to the contrary.
- The signature of the examiner who conducted the interview (if Form is not an attachment to a signed Office action)

It is desirable that the examiner orally remind the applicant of his or her obligation to record the substance of the interview of each case. It should be noted, however, that the Interview Summary Form will not normally be considered a complete and proper recordation of the interview unless it includes, or is supplemented by the applicant or the examiner to include, all of the applicable items required below concerning the substance of the interview.

A complete and proper recordation of the substance of any interview should include at least the following applicable items:
1) A brief description of the nature of any exhibit shown or any demonstration conducted,
2) an identification of the claims discussed,
3) an identification of the specific prior art discussed,
4) an identification of the principal proposed amendments of a substantive nature discussed, unless these are already described on the Interview Summary Form completed by the Examiner,
5) a brief identification of the general thrust of the principal arguments presented to the examiner,
   (The identification of arguments need not be lengthy or elaborate. A verbatim or highly detailed description of the arguments is not required. The identification of the arguments is sufficient if the general nature or thrust of the principal arguments made to the examiner can be understood in the context of the application file. Of course, the applicant may desire to emphasize and fully describe those arguments which he or she feels were or might be persuasive to the examiner.)
6) a general indication of any other pertinent matters discussed, and
7) if appropriate, the general results or outcome of the interview unless already described in the Interview Summary Form completed by the examiner.

Examiners are expected to carefully review the applicant's record of the substance of an interview. If the record is not complete and accurate, the examiner will give the applicant an extendable one month time period to correct the record.

Examiner to Check for Accuracy

If the claims are allowable for other reasons of record, the examiner should send a letter setting forth the examiner's version of the statement attributed to him or her. If the record is complete and accurate, the examiner should place the indication, "Interview Record OK" on the paper recording the substance of the interview along with the date and the examiner's initials.

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Appl. No.	:	11/842,747	Confirmation No.:	3897
Applicants	:	Ching-Yang Chang, *et al.*		
Filing Date	:	August 21, 2007		
Title	:	Conductor Pattern Structure Of Capacitive Touch Panel		
Group Art Unit	:	2629		
Examiner	:	Hicks, Charles V.		
Docket No.	:	22271-4002		
Customer No.	:	34313		

Via: USPTO EFS Web
Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

SUPPLEMENTAL AMENDMENT

Dear Sir:

This paper is responsive to the Interview with the Examiner on October 6, 2010. Please amend the above-identified application as follows:

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

Remarks/Arguments begin on page 10 of this paper.

REMARKS

Claims 1-45 are pending.

Claims 1 and 6 are rejected under 35 U.S.C. §102(b) as being anticipated by U.S. Patent No. 6,188,391 to Seely, *et al.* ("Seely").

Claims 2-4 and 7-9 are rejected under 35 U.S.C. § 103(a) as being unpatentable over Seely in view of U.S. Patent No. 7,030,860 to Hsu, *et al.* ("Hsu").

Claims 5 and 10 are rejected under 35 U.S.C. §103(a) as being unpatentable over Seely in view of U.S. Patent Appl. No. 2004/0119701 by Mulligan, *et al.* ("Mulligan").

Claims 11-45 had been added in the response filed on September 20, 2010.

Claims 1, 6, 32, and 42 have been amended.

Applicant respectfully requests entry of this amendment and reconsideration of the application in view of the foregoing amendments and the following.

INTERVIEW SUMMARY

Applicant's representatives, Robert M. Isackson (Reg. No. 31,110) and Hanburn Cho (Reg. No. 58,993), and Applicant, Dr. Alp Bayramoglu (CTO of Assignee, Reg. No., 66,305) sincerely appreciate Examiners Alexander S. Beck and Charles V. Hicks for their time on October 6, 2010 for a personal interview to discuss the patentability of the pending claims over Seely, Hsu, and Mulligan. During the interview, Applicant and Applicant's representatives (hereinafter "Applicant"), and the Examiners discussed the fundamental differences between the instant application and the cited references, Seely, Hsu, and Mulligan. In particular, Applicant discussed the lack of disclosure or teachings in Seely and Hsu for the claim limitation, "**a plurality of insulation layers**" recited in rejected claims 1 and 6. In the following section of this paper, Applicant submits supplemental response to clarify the claimed subject matter and to expedite prosecution of the instant application.

CLAIM REJECTIONS

During the interview, Applicant argued that Seely's insulation layer 94 is a single-sheet solder mask. Seely, Fig. 7; col. 6, 43-49. Therefore, Seely does not teach or suggest "**a plurality of insulation layers**," as recited in claim 1. Neither Hsu nor Mulligan teaches or suggests this feature of claim 1 because they are directed to four layer touch-pad design that has a single insulation sheet that separates the first-axis conductors and second-axis conductors. See Applicant's previous response dated 09/20/2010, pp. 11-19.

To further clarify this claimed feature over the cited references, claim 1 has been amended to recite "**each insulation layer of the plurality of insulation layers covering a surface of each first-axis conduction line without encompassing the adjacent first-axis conductor cells**." Emphasis added. The breaks 96 in Seely's solder mask exposes only the second-axis conductor cells (*i.e.*, floating diamonds 68), therefore the adjacent first-axis conductor cells are encompassed by the single-sheet solder mask. Seely, Fig. 7; col. 6, 50-54.

The Seely reference therefore does not teach or suggest Applicants' claimed subject matter that recites "**each insulation layer of the plurality of insulation layers covering a surface of each first-axis conduction line without encompassing the adjacent first-axis conductor cells**." Claim 1.

Claim 6 has been similarly amended to recite "**an insulation layer is formed on a surface of the first-axis conduction line without encompassing the two adjacent first-axis conductor cells**." As discussed above, Seely neither teaches nor suggests this feature of claim 6 because Seely's insulation layer is a <u>single-sheet</u> solder mask that encompasses the non-floating diamonds (*i.e.*, adjacent first-axis conductor cells). *See* Seely, Fig. 7.

Similarly, claims 32 and 42 have been amended to recite "**forming <u>a plurality of insulation layers</u> covering a surface of each first-axis conduction line <u>without encompassing the adjacent first-axis conductor cells</u>**."

In addition, Applicant respectfully submits that claims 1-5 and 11-45 are allowable over the Seely, Hsu, and Mulligan references, taken alone or in any combination, because none of them teaches or suggests "**a plurality of second-axis conductor lines**" that are used to connect "**adjacent ones of the second-axis conductor cells of each second-axis conductor assembly**," as called for in independent claim 1, and as similarly called for in independent claims 32 and 42. Rather, Seely teaches a <u>single-sheet</u> solder mask that has breaks in it so that a continuous conductive ink can be painted straight across the entire row (or column) of the floating diamonds. Seely, Fig. 7; col. 6, 50-54. Thus, Seely teaches to use <u>a single conduction line</u> for connecting each row of the floating diamonds, but not "**a plurality of second-axis conduction lines**" that respectively connect between adjacent ones of the second-axis conductor cells of each second-axis conductor assembly, as recited in claim 1 and similarly in claims 32, and 42. Neither Hsu nor Mulligan cures this deficiency in the primary reference Seely. Accordingly, Applicant respectfully submits that claims 1-5 and 11-45 are allowable under 35 U.S.C. ¶103(a) for this independent reason.

For these reasons, in addition to the verbal arguments discussed during the interview and the arguments set forth in the response filed September 20, 2010, Applicant respectfully submits that the Examiner's rejections of claims 1-10 over Seely, Hsu, and Mulligan have been overcome, and all the claims 1-45 now pending are in condition for allowance.

The Examiner is invited to call Applicant's undersigned representative if doing so would expedite prosecution.

Date: October 12, 2010

Respectfully submitted,

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Customer Number: 34313

22271-4002/261004821.2

Electronic Acknowledgement Receipt

EFS ID:	8613092
Application Number:	11842747
International Application Number:	
Confirmation Number:	3897
Title of Invention:	CONDUCTOR PATTERN STRUCTURE OF CAPACITIVE TOUCH PANEL
First Named Inventor/Applicant Name:	Ching-Yang Chang
Customer Number:	34313
Filer:	Hanbum Cho
Filer Authorized By:	
Attorney Docket Number:	22271.4002
Receipt Date:	12-OCT-2010
Filing Date:	21-AUG-2007
Time Stamp:	22:01:23
Application Type:	Utility under 35 USC 111(a)

Payment information:

Submitted with Payment	no

File Listing:

Document Number	Document Description	File Name	File Size(Bytes)/ Message Digest	Multi Part /.zip	Pages (if appl.)
1	Supplemental Response or Supplemental Amendment	4002_Supplemental_Amend_10_12_2010.pdf	2738413 5636d6e436e623e1d9812b772fe4b398a99a5841	no	13

Warnings:

Information:

Total Files Size (in bytes):	2738413

This Acknowledgement Receipt evidences receipt on the noted date by the USPTO of the indicated documents, characterized by the applicant, and including page counts, where applicable. It serves as evidence of receipt similar to a Post Card, as described in MPEP 503.

New Applications Under 35 U.S.C. 111

If a new application is being filed and the application includes the necessary components for a filing date (see 37 CFR 1.53(b)-(d) and MPEP 506), a Filing Receipt (37 CFR 1.54) will be issued in due course and the date shown on this Acknowledgement Receipt will establish the filing date of the application.

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

If a timely submission to enter the national stage of an international application is compliant with the conditions of 35 U.S.C. 371 and other applicable requirements a Form PCT/DO/EO/903 indicating acceptance of the application as a national stage submission under 35 U.S.C. 371 will be issued in addition to the Filing Receipt, in due course.

New International Application Filed with the USPTO as a Receiving Office

If a new international application is being filed and the international application includes the necessary components for an international filing date (see PCT Article 11 and MPEP 1810), a Notification of the International Application Number and of the International Filing Date (Form PCT/RO/105) will be issued in due course, subject to prescriptions concerning national security, and the date shown on this Acknowledgement Receipt will establish the international filing date of the application.

PATENT APPLICATION FEE DETERMINATION RECORD

Substitute for Form PTO-875

Application or Docket Number	Filing Date	
11/842,747	08/21/2007	☐ To be Mailed

APPLICATION AS FILED – PART I

FOR	NUMBER FILED (Column 1)	NUMBER EXTRA (Column 2)	SMALL ENTITY ☐ RATE ($)	FEE ($)	OR	OTHER THAN SMALL ENTITY RATE ($)	FEE ($)
☐ BASIC FEE (37 CFR 1.16(a), (b), or (c))	N/A	N/A	N/A			N/A	
☐ SEARCH FEE (37 CFR 1.16(k), (i), or (m))	N/A	N/A	N/A			N/A	
☐ EXAMINATION FEE (37 CFR 1.16(o), (p), or (q))	N/A	N/A	N/A			N/A	
TOTAL CLAIMS (37 CFR 1.16(i))	minus 20 =	*	X $ =		OR	X $ =	
INDEPENDENT CLAIMS (37 CFR 1.16(h))	minus 3 =	*	X $ =			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 $250 ($125 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))							
			TOTAL			TOTAL	

* If the difference in column 1 is less than zero, enter "0" in column 2.

APPLICATION AS AMENDED – PART II

AMENDMENT

10/12/2010	CLAIMS REMAINING AFTER AMENDMENT (Column 1)		HIGHEST NUMBER PREVIOUSLY PAID FOR (Column 2)	PRESENT EXTRA (Column 3)	SMALL ENTITY RATE ($)	ADDITIONAL FEE ($)	OR	OTHER THAN SMALL ENTITY RATE ($)	ADDITIONAL FEE ($)
Total (37 CFR 1.16(i))	* 45	Minus	** 45	= 0	X $ =		OR	X $52=	0
Independent (37 CFR 1.16(h))	* 4	Minus	***4	= 0	X $ =		OR	X $220=	0
☐ Application Size Fee (37 CFR 1.16(s))									
☐ FIRST PRESENTATION OF MULTIPLE DEPENDENT CLAIM (37 CFR 1.16(j))							OR		
					TOTAL ADD'L FEE		OR	TOTAL ADD'L FEE	0

AMENDMENT

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

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

Legal Instrument Examiner:
/TONYA MCBRIDE/

AMENDMENTS TO THE CLAIMS

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

1. (Currently amended) A conductor pattern structure of a capacitive touch panel formed on a surface of a substrate, the conductor pattern structure comprising:

a plurality of first-axis conductor assemblies, each first-axis conductor assembly comprising a plurality of first-axis conductor cells arranged on the surface of the substrate along a first axis in a substantially equally-spaced manner, a disposition zone being delimited between adjacent ones of the first-axis conductor assemblies and between adjacent ones of the first-axis conductor cells;

a plurality of first-axis conduction lines respectively connecting between adjacent ones of the first-axis conductor cells of each first-axis conductor assembly so that the first-axis conductor cells of each respective first-axis conductor assembly are electrically connected together;

a plurality of insulation layers, each <u>insulation layer of the plurality of insulation layers</u> covering a surface of each first-axis conduction line <u>without encompassing the adjacent first-axis conductor cells</u>;

a plurality of second-axis conductor assemblies, each second-axis conductor assembly comprising a plurality of second-axis conductor cells arranged on the surface of the substrate along a second axis in a substantially equally-spaced manner, each second-axis conductor cell being set in each disposition zone;

a plurality of second-axis conduction lines respectively connecting between adjacent ones of the second-axis conductor cells of each second-axis conductor assembly so that the second-axis conductor cells of each respective second-axis conductor assembly are electrically connected together, the second-axis conduction line being extended across a surface of the insulation layer of the respective first-axis conduction line,

wherein first-axis conductor cells and the second-axis conductor cells consist of a transparent conductive material.

2. (Previously presented) The conductor pattern structure as claimed in claim 1, wherein the first-axis conduction lines consist of a transparent conductive material.

3. (Previously presented) The conductor pattern structure as claimed in claim 1, wherein the second-axis conduction lines consist of a transparent conductive material.

4. (Original) The conductor pattern structure as claimed in claim 1, wherein the insulation layer consists of a transparent insulation material.

5. (Original) The conductor pattern structure as claimed in claim 1, wherein the first-axis conductor cells and the second-axis conductor cells have a contour of hexagonal shape.

6. (Currently amended) A conductor pattern structure of a capacitive touch panel formed on a surface of a substrate, the conductor pattern structure comprising:

at least two adjacent first-axis conductor cells; and

at least two adjacent second-axis conductor cells,

wherein the adjacent first-axis conductor cells are connected by a first-axis conduction line provided therebetween,

wherein an insulation layer is formed on a surface of the first-axis conduction line without encompassing the two adjacent first-axis conductor cells, and a second-axis conduction line extends across a surface of the insulation layer to connect between the adjacent second-axis conductor cells, and

wherein first-axis conductor cells and the second-axis conductor cells consist of a transparent conductive material.

7. (Previously presented) The conductor pattern structure as claimed in claim 6, wherein the first-axis conduction lines consist of a transparent conductive material.

8. (Previously presented) The conductor pattern structure as claimed in claim 6, wherein the second-axis conduction lines consist of a transparent conductive material.

9. (Original) The conductor pattern structure as claimed in claim 6, wherein the insulation layer consists of a transparent insulation material.

10. (Original) The conductor pattern structure as claimed in claim 6, wherein the first-axis conductor cells and the second-axis conductor cells have a contour of hexagonal shape.

11. (Previously presented) The conductor pattern structure as claimed in claim 1 further comprises a plurality of signal transmission lines formed on the surface of the substrate, each signal transmission line respectively connecting each first-axis conductor assembly and each second-axis conductor assembly.

12. (Previously presented) The conductor pattern structure as claimed in claim 11, wherein the first-axis conduction lines consist of a transparent conductive material.

13. (Previously presented) The conductor pattern structure as claimed in claim 11, wherein the second-axis conduction lines consist of a transparent conductive material.

14. (Previously presented) The conductor pattern structure as claimed in claim 11, wherein the insulation layer consists of a transparent insulation material.

15. (Previously presented) The conductor pattern structure as claimed in claim 11, wherein the first-axis conductor cells and the second-axis conductor cells have a contour of hexagonal shape.

16. (Previously presented) The conductor pattern structure as claimed in claim 11, wherein the transparent conductive material is Indium Tin Oxide (ITO).

17. (Previously presented) The conductor pattern structure as claimed in claim 11, wherein a capacitance between a first cell of the plurality of first-axis conductor cells and a second cell of the plurality of second-axis conductor cells is measured to detect a position of touch.

18. (Previously presented) The conductor pattern structure as claimed in claim 17, wherein the first-axis conduction lines consist of a transparent conductive material.

19. (Previously presented) The conductor pattern structure as claimed in claim 17, wherein the second-axis conduction lines consist of a transparent conductive material.

20. (Previously presented) The conductor pattern structure as claimed in claim 17, wherein the insulation layer consists of a transparent insulation material.

21. (Previously presented) The conductor pattern structure as claimed in claim 17, wherein the first-axis conductor cells and the second-axis conductor cells have a contour of hexagonal shape.

22. (Previously presented) The conductor pattern structure as claimed in claim 17, wherein each second-axis conduction line terminates on the edge of each second-axis conductor cell to the adjacent second-axis conductor cells.

23. (Previously presented) The conductor pattern structure as claimed in claim 17, wherein the transparent conductive material is Indium Tin Oxide (ITO).

24. (Previously presented) The conductor pattern structure as claimed in claim 1, wherein each second-axis conduction line terminates on the edge of each second-axis conductor cell to the adjacent second-axis conductor cells.

25. (Previously presented) The conductor pattern structure as claimed in claim 1, wherein a capacitance between a first cell of the plurality of first-axis conductor cells and a second cell of the plurality of second-axis conductor cells is measured to detect a position of touch.

26. (Previously presented) The conductor pattern structure as claimed in claim 25, wherein the first-axis conduction lines consist of a transparent conductive material.

27. (Previously presented) The conductor pattern structure as claimed in claim 25, wherein the second-axis conduction lines consist of a transparent conductive material.

28. (Previously presented) The conductor pattern structure as claimed in claim 25, wherein the insulation layer consists of a transparent insulation material.

29. (Previously presented) The conductor pattern structure as claimed in claim 25, wherein the first-axis conductor cells and the second-axis conductor cells have a contour of hexagonal shape.

30. (Previously presented) The conductor pattern structure as claimed in claim 25, wherein the transparent conductive material is Indium Tin Oxide (ITO).

31. (Previously presented) The conductor pattern structure as claimed in claim 1, wherein the transparent conductive material is Indium Tin Oxide (ITO).

32. (Currently amended) A method of constructing a conductor pattern structure of a capacitive touch panel, the method comprising:

forming a plurality of first-axis conductor cells on a surface of a substrate arranged along a first axis in a substantially equally-spaced manner,

forming a plurality of second-axis conductor cells on the surface of the substrate arranged along a second axis in a substantially equally-spaced manner;

electrically connecting adjacent ones of the first-axis conductor cells along the first-axis using a plurality of first-axis conduction lines to form a plurality of first-axis conductor assemblies, wherein each second-axis conductor cell is set in each disposition zone being delimited between adjacent ones of the first-axis conductor assemblies and between adjacent ones of the first-axis conductor cells;

forming a plurality of insulation layers covering a surface of each first-axis conduction line <u>without encompassing the adjacent first-axis conductor cells</u>; and

electrically connecting adjacent ones of the second-axis conductor cells along the second-axis using a plurality of second-axis conduction lines to form a plurality of second-axis conductor assemblies, each of the first-axis conductor cells and the second-axis conductor cells consisting of a transparent conductive material.

33. (Previously presented) The method of claim 32, wherein the first-axis conductor cells, the second-axis conductor cells and the first-axis conduction lines are formed simultaneously.

34. (Previously presented) The method of claim 32 further comprising forming a plurality of signal transmission lines on the surface of the substrate, each signal transmission line respectively connecting each first-axis conductor assembly and each second-axis conductor assembly.

35. (Previously presented) The method of claim 32 further comprising measuring a capacitance between a first cell of the plurality of first-axis conductor cells and a second cell of the plurality of second-axis conductor cells to detect a position of touch.

36. (Previously presented) The method of claim 32, wherein the first-axis conduction lines consist of a transparent conductive material.

37. (Previously presented) The method of claim 32, wherein the second-axis conduction lines consist of a transparent conductive material.

38. (Previously presented) The method of claim 32, wherein the insulation layer consists of a transparent insulation material.

39. (Previously presented) The method of claim 32, wherein the first-axis conductor cells and the second-axis conductor cells have a contour of hexagonal shape.

40. (Previously presented) The method of claim 32, wherein each second-axis conduction line terminates on the edge of each second-axis conductor cell to the adjacent second-axis conductor cells.

41. (Previously presented) The method of claim 32, wherein the transparent conductive material is Indium Tin Oxide (ITO).

42. (Currently amended) A method of constructing a conductor pattern structure of a capacitive touch panel, the method comprising:

forming a plurality of first-axis conductor cells on a surface of a substrate arranged along a first axis in a substantially equally-spaced manner, wherein each first-axis conductor cell is separated by each disposition zone between adjacent ones of the first-axis conductor cells;

electrically connecting adjacent ones of the first-axis conductor cells along the first-axis using a plurality of first-axis conduction lines to form a plurality of first-axis conductor assemblies;

forming a plurality of insulation layers covering a surface of each first-axis conduction line without encompassing the adjacent first-axis conductor cells;

forming a plurality of second-axis conductor cells in each disposition zone between adjacent ones of the first-axis conductor cells on the surface of the substrate arranged along a second axis in a substantially equally-spaced manner; and

electrically connecting adjacent ones of the second-axis conductor cells along the second-axis using a plurality of second-axis conduction lines to form a plurality of second-axis conductor assemblies, each of the first-axis conductor cells and the second-axis conductor cells consisting of a transparent conductive material.

43. (Previously presented) The method of claim 42 further comprising forming a plurality of signal transmission lines on the surface of the substrate, each signal transmission line respectively connecting each first-axis conductor assembly and each second-axis conductor assembly.

44. (Previously presented) The method of claim 42 further comprising measuring a capacitance between a first cell of the plurality of first-axis conductor cells and a second cell of the plurality of second-axis conductor cells to detect a position of touch.

45. (Previously presented) The method of claim 42, wherein the transparent conductive material is Indium Tin Oxide (ITO).

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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
11/842,747	08/21/2007	Ching-Yang Chang	22271.4002	3897

34313 7590 12/21/2010

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EXAMINER	
HICKS, CHARLES V	
ART UNIT	**PAPER NUMBER**
2629	

MAIL DATE	DELIVERY MODE
12/21/2010	PAPER

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.

Office Action Summary	Application No.	Applicant(s)	
	11/842,747	CHANG ET AL.	
	Examiner	Art Unit	
	CHARLES HICKS	2629	

-- 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 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

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

Status

1)☒ Responsive to communication(s) filed on *12 October 2010*.

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

3)☐ 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

4)☒ Claim(s) *1-45* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-45* is/are rejected.

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

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

Application Papers

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

10)☒ The drawing(s) filed on *21 August 2007* 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).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

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).

a)☒ All b)☐ Some * c)☐ None of:

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) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)

3) ☐ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _____.

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

5) ☐ Notice of Informal Patent Application

6) ☐ Other: _____.

DETAILED ACTION

This communication is responsive to amendments filed 09/20/2010 with claims 1-3 and 6-8 being amended, and claims 11-45 being new, and amendments filed 10/12/2010 with claims 1, 6, 32 and 42 being amended. Claims 1-45 are currently pending.

Claim Rejections - 35 USC § 102

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

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

Claims 1-4, 6-9, 11-14, 16-20, 22-28, 30-38 and 40-45 are rejected under 35 U.S.C. 102(b) as being anticipated by Bolender (US 2005/0030048).

In reference to claim 1, Bolender teaches a conductor pattern structure of a capacitive touch panel, formed on a surface of a substrate (Bolender, Fig. 3B; pg. 2, par. 28),

the conductor pattern structure comprising: a plurality of first-axis conductor assemblies, each first-axis conductor assembly comprising a plurality of first-axis conductor cells arranged on the surface of the substrate along a first axis in a substantially equally-spaced manner (Bolender, Fig. 3B; pg. 3, par. 35-36), a disposition zone being delimited between adjacent ones of the first-axis conductor assemblies and between adjacent ones of the first-axis conductor cells (Bolender, Fig. 3B; pg. 3, par. 35-36),

a plurality of first-axis conduction lines respectively connecting between adjacent ones of the first-axis conductor cells of each first-axis conductor assembly so that the first-axis conductor cells of each respective first-axis conductor assembly are electrically connected together (Bolender, Fig. 3B; pg. 3, par. 35-36);

a plurality of insulation layers, each insulation layer of the plurality of insulation layers covering a surface of each first-axis conduction line without encompassing the adjacent first-axis conductor cells (Bolender, Figs. 3B, 12; pg. 3, par. 36; pg. 7, par. 70);

a plurality of second-axis conductor assemblies, each second-axis conductor assembly comprising a plurality of second-axis conductor cells arranged on the surface of the substrate along a second axis in a substantially equally-spaced manner (Bolender, Fig. 3B; pg. 3, par. 35-36),

each second-axis conductor cell being set in each disposition zone (Bolender, Fig. 3B; pg. 3, par. 35-36);

a plurality of second-axis conduction lines respectively connecting between adjacent ones of the second-axis conductor cells of each second-axis conductor assembly so that the second-axis conductor cells of each respective second-axis conductor assembly are electrically connected together (Bolender, Fig. 3B; pg. 3, par. 35-36);

the second-axis conduction line being extended across a surface of the insulation layer of the respective first-axis conduction line (Bolender, Fig. 3B; pg. 3, par. 35-36);

wherein first-axis conduction cells and the second-axis conductor cells consist of a transparent conductive material (Bolender, pg. 2, par. 22).

Claim 2 is rejected as being dependent on rejected claim 1 as discussed above and further, Bolender teaches wherein the first-axis conduction lines consist of a transparent conductive material (Bolender, pg. 4, par. 42; pg. 6, par. 60).

Claim 3 is rejected as being dependent on rejected claim 1 as discussed above and further, Bolender teaches wherein the second-axis conduction lines consist of a transparent conductive material (Bolender, pg. 4, par. 42; pg. 6, par. 60).

Claim 4 is rejected as being dependent on rejected claim 1 as discussed above and further, Bolender teaches wherein the insulation layer consists of a transparent insulation material (Bolender, pg. 4, par. 40).

In reference to claim 6, Bolender teaches a conductor pattern structure of a capacitive touch panel formed on a surface of a substrate (Bolender, Fig. 3B; pg. 2, par. 28),

the conductor pattern structure comprising: at least two adjacent first-axis conductor cells (Bolender, Fig. 3B; pg. 3, par. 35-36), and at least two adjacent second-axis conductor cells (Bolender, Fig. 3B; pg. 3, par. 35-36),

wherein the adjacent first-axis conductor cells are connected by a first-axis conduction line provided therebetween (Bolender, Fig. 3B; pg. 3, par. 35-36),

wherein an insulation layer is formed on a surface of the first-axis conduction line without encompassing the two adjacent first-axis conductor cells (Bolender, Figs. 3B, 12; pg. 3, par. 36; pg. 7, par. 70);

and a second-axis conduction line extends across a surface of the insulation layer to connect between the adjacent second-axis conductor cell (Bolender, Fig. 3B; pg. 3, par. 35-36),

and wherein first-axis conductor cells and the second-axis conductor cells consist of a transparent conductive material (Bolender, pg. 2, par. 22).

Claim 7 is rejected as being dependent on rejected claim 6 as discussed above and further, Bolender teaches wherein the first-axis conduction lines consist of a transparent conductive material (Bolender, pg. 4, par. 42; pg. 6, par. 60).

Claim 8 is rejected as being dependent on rejected claim 6 as discussed above and further, Bolender teaches wherein the second-axis conduction line consist of a transparent conductive material (Bolender, pg. 4, par. 42; pg. 6, par. 60).

Claim 9 is rejected as being dependent on rejected claim 6 as discussed above and further, Bolender teaches wherein the insulation layer consists of a transparent insulation material (Bolender, pg. 4, par. 40).

Claim 11 is rejected as being dependent on rejected claim 1 as discussed above and further, Bolender teaches wherein the conductor pattern structure further comprises a plurality of signal transmission lines formed on the surface of the substrate, each signal transmission line respectively connecting each first-axis conductor assembly and each second-axis conductor assembly (Bolender, Fig. 3B; pg. 3, par. 35-36).

Claim 12 is rejected as being dependent on rejected claim 11 as discussed above and further, Bolender teaches wherein the first-axis conduction lines consist of a transparent conductive material (Bolender, pg. 4, par. 42; pg. 6, par. 60).

Claim 13 is rejected as being dependent on rejected claim 11 as discussed above and further, Bolender teaches wherein the second-axis conduction lines consist of a transparent conductive material (Bolender, pg. 4, par. 42; pg. 6, par. 60).

Claim 14 is rejected as being dependent on rejected claim 11 as discussed above and further, Bolender teaches wherein the insulation layer consists of a transparent insulation material (Bolender, pg. 4, par. 40).

Claim 16 is rejected as being dependent on rejected claim 11 as discussed above and further, Bolender teaches wherein the transparent conductive material is Indium Tin Oxide (ITO) (Bolender, pg. 2, par. 23; pg. 5, par. 48).

Claim 17 is rejected as being dependent on rejected claim 11 as discussed above and further, Bolender teaches wherein a capacitance between a first cell of the plurality of first-axis cells and a second cell of the plurality of second-axis cells is measured to detect a position of touch (Bolender, pg. 2, par. 29).

Claim 18 is rejected as being dependent on rejected claim 17 as discussed above and further, Bolender teaches wherein the first-axis conduction lines consist of a transparent conductive material (Bolender, pg. 4, par. 42; pg. 6, par. 60).

Claim 19 is rejected as being dependent on rejected claim 17 as discussed above and further, Bolender teaches wherein the second-axis conduction lines consist of a transparent conductive material (Bolender, pg. 4, par. 42; pg. 6, par. 60).

Claim 20 is rejected as being dependent on rejected claim 17 as discussed above and further, Bolender teaches wherein the insulation layer consists of a transparent insulation material (Bolender, pg. 4, par. 40).

Claim 22 is rejected as being dependent on rejected claim 17 as discussed above and further, Bolender teaches wherein each second-axis conduction line terminates on the edge of each second-axis conductor cell to the adjacent second-axis conductor cells (Bolender, Fig. 3B).

Claim 23 is rejected as being dependent on rejected claim 17 as discussed above and further, Bolender teaches wherein the transparent conductive material is Indium Tin Oxide (ITO) (Bolender, pg. 2, par. 23; pg. 5, par. 48).

Claim 24 is rejected as being dependent on rejected claim 1 as discussed above and further, Bolender teaches wherein each second-axis conduction line terminates on the edge of each second-axis conductor cell to the adjacent second-axis conductor cells (Bolender, Fig. 3B).

Claim 25 is rejected as being dependent on rejected claim 1 as discussed above and further, Bolender teaches wherein a capacitance between a first cell of the plurality of first-axis cells and a second cell of the plurality of second-axis cells is measured to detect a position of touch (Bolender, pg. 2, par. 29).

Claim 26 is rejected as being dependent on rejected claim 25 as discussed above and further, Bolender teaches wherein the first-axis conduction lines consist of a transparent conductive material (Bolender, pg. 4, par. 42; pg. 6, par. 60).

Claim 27 is rejected as being dependent on rejected claim 25 as discussed above and further, Bolender teaches wherein the second-axis conduction lines consist of a transparent conductive material (Bolender, pg. 4, par. 42; pg. 6, par. 60).

Claim 28 is rejected as being dependent on rejected claim 25 as discussed above and further, Bolender teaches wherein the insulation layer consists of a transparent insulation material (Bolender, pg. 4, par. 40).

Claim 30 is rejected as being dependent on rejected claim 25 as discussed above and further, Bolender teaches wherein the transparent conductive material is Indium Tin Oxide (ITO) (Bolender, pg. 2, par. 23; pg. 5, par. 48).

Claim 31 is rejected as being dependent on rejected claim 1 as discussed above and further, Bolender teaches wherein the transparent conductive material is Indium Tin Oxide (ITO) (Bolender, pg. 2, par. 23; pg. 5, par. 48).

In reference to claim 32, Bolender teaches a method of constructing a conductor pattern structure of a capacitive touch panel, the method comprising: forming a plurality of first-axis conductor cells on a surface of a substrate arranged along a first axis in a substantially equally-spaced manner (Bolender, Fig. 3B; pg. 3, par. 35-36), forming a plurality of second-axis conductor cells on the surface of the substrate arranged along a second axis in a substantially equally spaced manner (Bolender, Fig. 3B; pg. 3, par. 35-36);

electrically connecting adjacent ones of the first-axis conductor cells along the first-axis using a plurality of first-axis conduction lines to form a plurality of first-axis conductor assemblies (Bolender, Fig. 3B; pg. 3, par. 35-36),

wherein each second-axis conductor cell is set in each disposition zone being delimited between adjacent ones of first-axis conductor assemblies and between adjacent ones of the first-axis conductor cells (Bolender, Fig. 3B; pg. 3, par. 35-36);

forming a plurality of insulation layers covering a surface of each first-axis conduction line without encompassing the adjacent first-axis conductor cells (Bolender, Figs. 3B, 12; pg. 3, par. 35; pg. 7, par. 70);

and electrically connecting adjacent ones of the second-axis conductor cells along the second-axis using a plurality of second-axis conduction lines to form a plurality of second-axis conductor assemblies (Bolender, Fig. 3B; pg. 3, par. 35-36),

each of the first-axis conductor cells and the second-axis conductor cells consisting of a transparent conductive material (Bolender, pg. 2, par. 22).

Claim 33 is rejected as being dependent on rejected claim 32 as discussed above and further, Bolender teaches wherein the first-axis conductor cells, the second-axis conductor cells and the first-axis conduction lines are formed simultaneously (Bolender, pg. 2, par. 23, 28).

Claim 34 is rejected as being dependent on rejected claim 32 as discussed above and further, Bolender teaches further comprising forming a plurality of signal transmission lines on the surface of the substrate, each signal transmission line respectively connecting each first-axis conductor assembly and each second-axis conductor assembly (Bolender, Fig. 3B; pg. 3, par. 35-36).

Claim 35 is rejected as being dependent on rejected claim 32 as discussed above and further, Bolender teaches further comprising measuring a capacitance between a first cell of the plurality of first-axis cells and a second cell of the plurality of second-axis cells to detect a position of touch (Bolender, pg. 2, par. 29).

Claim 36 is rejected as being dependent on rejected claim 32 as discussed above and further, Bolender teaches wherein the first-axis conduction lines consist of a transparent conductive material (Bolender, pg. 4, par. 42; pg. 6, par. 60).

Claim 37 is rejected as being dependent on rejected claim 32 as discussed above and further, Bolender teaches wherein the second-axis conduction lines consist of a transparent conductive material (Bolender, pg. 4, par. 42; pg. 6, par. 60).

Claim 38 is rejected as being dependent on rejected claim 32 as discussed above and further, Bolender teaches wherein the insulation layer consists of a transparent insulation material (Bolender, pg. 4, par. 40).

Claim 40 is rejected as being dependent on rejected claim 32 as discussed above and further, Bolender teaches wherein each second-axis conduction line terminates on the edge of each second-axis conductor cell to the adjacent second-axis conductor cells (Bolender, Fig. 3B).

Claim 41 is rejected as being dependent on rejected claim 32 as discussed above and further, Bolender teaches wherein the transparent conductive material is Indium Tin Oxide (ITO) (Bolender, pg. 2, par. 23; pg. 5, par. 48).

In reference to claim 42, Bolender teaches a method of constructing a conductor pattern structure of a capacitive touch panel, the method comprising: forming a plurality of first-axis conductor cells on a surface of a substrate arranged along a first axis in a substantially equally-spaced manner (Bolender, Fig. 3B; pg. 3, par. 35-36),

wherein each first-axis conductor cell is separated by each disposition zone between adjacent ones of the first-axis conductor cells (Bolender, Fig. 3B; pg. 3, par. 35-36);

electrically connecting adjacent ones of the first-axis conductor cells along the first-axis using a plurality of first-axis conduction lines to form a plurality of first-axis conductor assemblies (Bolender, Fig. 3B; pg. 3, par. 35-36);

forming a plurality of insulation layers covering a surface of each first-axis conduction line without encompassing the adjacent first-axis conductor cells (Bolender, Figs. 3B, 12; pg. 3, par. 35;pg. 7, par. 70);

forming a plurality of second-axis conductor cells in each disposition zone between adjacent ones of the first-axis conductor cells on the surface of the substrate arranged along a second axis in a substantially equally-spaced manner (Bolender, Fig. 3B; pg. 3, par. 35-36);

and electrically connecting adjacent ones of the second-axis conductor cells along the second-axis using a plurality of second-axis conduction lines to form a plurality of second-axis conductor assemblies (Bolender, Fig. 3B; pg. 3, par. 35-36),

each of the first-axis conductor cells and the second-axis conductor cells consisting of a transparent conductive material (Bolender, pg. 2, par. 22).

Claim 43 is rejected as being dependent on rejected claim 42 as discussed above and further, Bolender teaches further comprising forming a plurality of signal transmission lines on the surface of the substrate, each signal transmission line respectively connecting each first-axis conductor assembly and each second-axis conductor assembly (Bolender, Fig. 3B; pg. 3, par. 35-36).

Claim 44 is rejected as being dependent on rejected claim 42 as discussed above and further, Bolender teaches further comprising measuring a capacitance between a first cell of the plurality of first-axis cells and a second cell of the plurality of second-axis cells to detect a position of touch (Bolender, pg. 2, par. 29).

Claim 45 is rejected as being dependent on rejected claim 42 as discussed above and further, Bolender teaches wherein the transparent conductive material is Indium Tin Oxide (ITO) (Bolender, pg. 2, par. 23; pg. 5, par. 48).

Claim Rejections - 35 USC § 103

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

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

This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

Claims 5, 10, 15, 21, 29 and 39 are rejected under 35 U.S.C. 103(a) as being unpatentable over Bolender et al. (US 2005/0030048) in view of Mulligan et al. (US 2004/0119701).

Claim 5 is rejected as being dependent on rejected claim 1 as discussed above and further, Bolender however fails to teach wherein the first-axis conductor cells and the second-axis conductor cells have a contour of hexagonal shape.

Mulligan discloses a touch sensing system, analogous in art with that of Bolender, wherein first-axis conductor cells and second-axis conductor cells have a contour of hexagonal shape (Mulligan, pg. 4, par. 38).

At the time the invention was made, it would have been obvious to one having ordinary skill in the art to substitute the first-axis conductor cells and second-axis conductor cells of Bolender, with the hexagonal shaped cells of Mulligan, such that the first-axis conductor cells and the second-axis conductor cells have a contour of hexagonal shape, as taught by Mulligan.

As one of ordinary skill in the art would appreciate, the suggestion/motivation for doing so would have been simple substitution of one known element, hexagonal shaped sensor cells, for another to obtain predictable results, namely, a capacitive touch sensor input device (Mulligan, pg. 4, par. 38).

Claim 10 is rejected as being dependent on rejected claim 6 as discussed above and further, Bolender however fails to teach wherein the first-axis conductor cells and the second-axis conductor cells have a contour of hexagonal shape.

Mulligan discloses a touch sensing system, analogous in art with that of Bolender, wherein first-axis conductor cells and second-axis conductor cells have a contour of hexagonal shape (Mulligan, pg. 4, par. 38).

At the time the invention was made, it would have been obvious to one having ordinary skill in the art to substitute the first-axis conductor cells and second-axis conductor cells of Bolender, with the hexagonal shaped cells of Mulligan, such that the first-axis conductor cells and the second-axis conductor cells have a contour of hexagonal shape, as taught by Mulligan.

As one of ordinary skill in the art would appreciate, the suggestion/motivation for doing so would have been simple substitution of one known element, hexagonal shaped sensor cells, for another to obtain predictable results, namely, a capacitive touch sensor input device (Mulligan, pg. 4, par. 38).

Claim 15 is rejected as being dependent on rejected claim 11 as discussed above and further, Bolender however fails to teach wherein the first-axis conductor cells and the second-axis conductor cells have a contour of hexagonal shape.

Mulligan discloses a touch sensing system, analogous in art with that of Bolender, wherein first-axis conductor cells and second-axis conductor cells have a contour of hexagonal shape (Mulligan, pg. 4, par. 38).

At the time the invention was made, it would have been obvious to one having ordinary skill in the art to substitute the first-axis conductor cells and second-axis conductor cells of Bolender, with the hexagonal shaped cells of Mulligan, such that the first-axis conductor cells and the second-axis conductor cells have a contour of hexagonal shape, as taught by Mulligan.

As one of ordinary skill in the art would appreciate, the suggestion/motivation for doing so would have been simple substitution of one known element, hexagonal shaped sensor cells, for another to obtain predictable results, namely, a capacitive touch sensor input device (Mulligan, pg. 4, par. 38).

Claim 21 is rejected as being dependent on rejected claim 17 as discussed above and further, Bolender however fails to teach wherein the first-axis conductor cells and the second-axis conductor cells have a contour of hexagonal shape.

Mulligan discloses a touch sensing system, analogous in art with that of Bolender, wherein first-axis conductor cells and second-axis conductor cells have a contour of hexagonal shape (Mulligan, pg. 4, par. 38).

At the time the invention was made, it would have been obvious to one having ordinary skill in the art to substitute the first-axis conductor cells and second-axis conductor cells of Bolender, with the hexagonal shaped cells of Mulligan, such that the first-axis conductor cells and the second-axis conductor cells have a contour of hexagonal shape, as taught by Mulligan.

As one of ordinary skill in the art would appreciate, the suggestion/motivation for doing so would have been simple substitution of one known element, hexagonal shaped sensor cells, for another to obtain predictable results, namely, a capacitive touch sensor input device (Mulligan, pg. 4, par. 38).

Claim 29 is rejected as being dependent on rejected claim 25 as discussed above and further, Bolender however fails to teach wherein the first-axis conductor cells and the second-axis conductor cells have a contour of hexagonal shape.

Mulligan discloses a touch sensing system, analogous in art with that of Bolender, wherein first-axis conductor cells and second-axis conductor cells have a contour of hexagonal shape (Mulligan, pg. 4, par. 38).

At the time the invention was made, it would have been obvious to one having ordinary skill in the art to substitute the first-axis conductor cells and second-axis conductor cells of Bolender, with the hexagonal shaped cells of Mulligan, such that the first-axis conductor cells and the second-axis conductor cells have a contour of hexagonal shape, as taught by Mulligan.

As one of ordinary skill in the art would appreciate, the suggestion/motivation for doing so would have been simple substitution of one known element, hexagonal shaped sensor cells, for another to obtain predictable results, namely, a capacitive touch sensor input device (Mulligan, pg. 4, par. 38).

Claim 39 is rejected as being dependent on rejected claim 32 as discussed above and further, Bolender however fails to teach wherein the first-axis conductor cells and the second-axis conductor cells have a contour of hexagonal shape.

Mulligan discloses a touch sensing system, analogous in art with that of Bolender, wherein first-axis conductor cells and second-axis conductor cells have a contour of hexagonal shape (Mulligan, pg. 4, par. 38).

At the time the invention was made, it would have been obvious to one having ordinary skill in the art to substitute the first-axis conductor cells and second-axis conductor cells of Bolender, with the hexagonal shaped cells of Mulligan, such that the first-axis conductor cells and the second-axis conductor cells have a contour of hexagonal shape, as taught by Mulligan.

As one of ordinary skill in the art would appreciate, the suggestion/motivation for doing so would have been simple substitution of one known element, hexagonal shaped sensor cells, for another to obtain predictable results, namely, a capacitive touch sensor input device (Mulligan, pg. 4, par. 38).

Response to Arguments

Applicant's arguments with respect to claims 1-45 have been considered but are moot in view of the new ground(s) of rejection.

Conclusion

THIS ACTION IS MADE FINAL. Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to CHARLES HICKS whose telephone number is 571-270-7535. The examiner can normally be reached on Monday-Thursday from 7:30 to 4:00.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Sumati Lefkowitz, can be reached on 571-272-3638. 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://portal.uspto.gov/external/portal.

Should you have questions on access to the Private PAIR system, contact the

Electronic Business Center (EBC) at 866-217-9197 (toll-free).

/Sumati Lefkowitz/
Supervisory Patent Examiner, Art Unit 2629

Notice of References Cited	Application/Control No. 11/842,747	Applicant(s)/Patent Under Reexamination CHANG ET AL.	
	Examiner CHARLES HICKS	Art Unit 2629	Page 1 of 1

U.S. PATENT DOCUMENTS

*		Document Number Country Code-Number-Kind Code	Date MM-YYYY	Name	Classification
*	A	US-2005/0030048	02-2005	Bolender et al.	324/661
	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	Classification
	N					
	O					
	P					
	Q					
	R					
	S					
	T					

NON-PATENT DOCUMENTS

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

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

Index of Claims	Application/Control No.	Applicant(s)/Patent Under Reexamination
11842747	11842747	CHANG ET AL.
	Examiner	Art Unit
	CHARLES HICKS	2629

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

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

CLAIM		DATE								
Final	Original	06/07/2010	12/03/2010							
	1	✓	✓							
	2	✓	✓							
	3	✓	✓							
	4	✓	✓							
	5	✓	✓							
	6	✓	✓							
	7	✓	✓							
	8	✓	✓							
	9	✓	✓							
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	28		✓							
	29		✓							
	30		✓							
	31		✓							
	32		✓							
	33		✓							

Index of Claims	Application/Control No.	Applicant(s)/Patent Under Reexamination
	11842747	CHANG ET AL.
11842747	Examiner	Art Unit
	CHARLES HICKS	2629

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

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

CLAIM		DATE								
Final	Original	06/07/2010	12/03/2010							
	34		✓							
	35		✓							
	36		✓							
	37		✓							
	38		✓							
	39		✓							
	40		✓							
	41		✓							
	42		✓							
	43		✓							
	44		✓							
	45		✓							

Search Notes *11842747*	Application/Control No. 11842747	Applicant(s)/Patent Under Reexamination CHANG ET AL.
	Examiner CHARLES HICKS	Art Unit 2629

SEARCHED

Class	Subclass	Date	Examiner
345	173-184	06/07/2010	CH
178	18.01-18.08	06/07/2010	CH
341	33-34	06/07/2010	CH
Above updated		12/03/2010	CH

SEARCH NOTES

Search Notes	Date	Examiner
Inventor search	06/07/2010	CH
East search	06/07/2010	CH
Above updated	12/03/2010	CH

INTERFERENCE SEARCH

Class	Subclass	Date	Examiner

EAST Search History

EAST Search History (Prior Art)

Ref #	Hits	Search Query	DBs	Default Operator	Plurals	Time Stamp
L1	1	"20050030048" and (substrate)	US-PGPUB; USPAT	ADJ	ON	2010/12/03 14:34
L2	1	"20050030048" and (sensor)	US-PGPUB; USPAT	ADJ	ON	2010/12/03 14:38
L3	1	"20050030048" and (ito or indium)	US-PGPUB; USPAT	ADJ	ON	2010/12/03 15:26
L5	1	"20050030048" and (capacit$5)	US-PGPUB; USPAT	ADJ	ON	2010/12/03 15:33
L8	1	"20050030048" and (conductor or line)	US-PGPUB; USPAT	ADJ	ON	2010/12/03 15:49
L9	1	"20050030048" and (formed)	US-PGPUB; USPAT	ADJ	ON	2010/12/03 16:24
L10	1	"20050030048" and (single sheet)	US-PGPUB; USPAT	ADJ	ON	2010/12/03 16:28
L11	1	"20080264699" and method	US-PGPUB; USPAT	ADJ	ON	2010/12/03 17:35
L12	1	"20080264699" and construct$5	US-PGPUB; USPAT	ADJ	ON	2010/12/03 17:40
S1	1	"20080264699"	US-PGPUB; USPAT	ADJ	ON	2010/06/07 10:55
S2	2	((CHING-YANG) near2 (CHANG)).INV.	US-PGPUB; USPAT	ADJ	ON	2010/06/07 10:55
S3	8	((SHUN-TA) near2 (CHIEN)).INV.	US-PGPUB; USPAT	ADJ	ON	2010/06/07 10:56

S5	3	(S2 or S3) and capacitive touch	US-PGPUB; USPAT	ADJ	ON	2010/06/07 10:56
S6	1051	(345/173-184.ccls. or 178/18.01-18.06.ccls.) and capacitive touch	US-PGPUB; USPAT	ADJ	ON	2010/06/07 11:16
S7	270	S6 and (second or y) axis	US-PGPUB; USPAT	ADJ	ON	2010/06/07 11:17
S8	3	S6 and ((second or y) axis same cell)	US-PGPUB; USPAT	ADJ	ON	2010/06/07 11:18
S9	2	"6188391".pn. or "6137427".pn.	US-PGPUB; USPAT	ADJ	ON	2010/06/07 12:35
S10	1095	(345/173-184.ccls. or 178/18.01-18.06.ccls. or 341/33-34.ccls.) and capacitive touch	US-PGPUB; USPAT	ADJ	ON	2010/06/07 12:42
S11	1	"6188391".pn. and capacit$5	US-PGPUB; USPAT	ADJ	ON	2010/06/07 12:43
S15	1	"6188391".pn. and (touch) and substrate	US-PGPUB; USPAT	ADJ	ON	2010/06/07 12:49
S16	1	"6188391".pn. and (horizontal or vertical)	US-PGPUB; USPAT	ADJ	ON	2010/06/07 12:52
S17	1	"6188391".pn. and (horizontal or vertical) and insulat$5	US-PGPUB; USPAT	ADJ	ON	2010/06/07 12:59
S18	0	"6188391".pn. and transparent	US-PGPUB; USPAT	ADJ	ON	2010/06/07 13:15
S19	1	("6188391".pn. or "6137427".pn.) and transparent	US-PGPUB; USPAT	ADJ	ON	2010/06/07 13:15
S20	16	S10 and (transparent same capacitive same cell)	US-PGPUB; USPAT	ADJ	ON	2010/06/07 13:17
S21	8	S10 and (transparent same capacitive same cell) and (transparent same insulat$5)	US-PGPUB; USPAT	ADJ	ON	2010/06/07 13:17

S22	1	"7030860".pn. and (transparent same sensor)	US-PGPUB; USPAT	ADJ	ON	2010/06/07 13:25
S23	1	"7030860".pn. and (transparent)	US-PGPUB; USPAT	ADJ	ON	2010/06/07 13:30
S24	38	S10 and ((cell or sensor) same hexagon $4)	US-PGPUB; USPAT	ADJ	ON	2010/06/07 13:41
S25	38	S24 and (capacitive same touch)	US-PGPUB; USPAT	ADJ	ON	2010/06/07 13:42
S26	3	(US-20040119701-$).did. or (US-7030860-$ or US-6188391-$).did.	US-PGPUB; USPAT	ADJ	ON	2010/10/05 15:51
S27	2	S26 and transparent	US-PGPUB; USPAT	ADJ	ON	2010/10/05 15:51
S28	1	"20080264699" and circuit	US-PGPUB; USPAT	ADJ	ON	2010/10/06 08:14
S29	1	"7030860".pn. and (ito or idium)	US-PGPUB; USPAT	ADJ	ON	2010/10/06 08:32
S30	1	"20050030048"	US-PGPUB; USPAT	ADJ	ON	2010/12/02 14:53
S31	1	"20050030048" and insulat$5	US-PGPUB; USPAT	ADJ	ON	2010/12/03 09:18
S32	1	"20050030048" and diamond	US-PGPUB; USPAT	ADJ	ON	2010/12/03 11:23
S33	1	"20050030048" and transparent	US-PGPUB; USPAT	ADJ	ON	2010/12/03 11:55
S34	1	"20050030048" and (transparent same line)	US-PGPUB; USPAT	ADJ	ON	2010/12/03 11:59
S35	1	"20050030048" and (transparent same substrate)	US-PGPUB; USPAT	ADJ	ON	2010/12/03 12:02
S36	1	"20050030048" and (transparent same insulat$5)	US-PGPUB; USPAT	ADJ	ON	2010/12/03 12:03

S37	0	"20050030048" and (hexagon$5)	US-PGPUB; USPAT	ADJ	ON	2010/12/03 12:04
S38	1	"20050030048" and (transparent same sensor)	US-PGPUB; USPAT	ADJ	ON	2010/12/03 13:06

12/3/2010 6:22:36 PM
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IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Appl. No.	:	11/842,747	Confirmation No.:	3897
Applicants	:	Ching-Yang Chang, *et al.*		
Filing Date	:	August 21, 2007		
Title	:	Conductor Pattern Structure Of Capacitive Touch Panel		
Group Art Unit	:	2629		
Examiner	:	Hicks, Charles V.		
Docket No.	:	22271-4002		
Customer No.	:	34313		

Via: USPTO EFS Web
Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

AMENDMENT AND RESPONSE AFTER FINAL

Dear Sir:

This paper is responsive to the Final Office Action mailed on December 21, 2010.

Please amend the above-identified application as follows:

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

Remarks/Arguments begin on page 20 of this paper.

AMENDMENTS TO THE CLAIMS

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

1. (Previously presented) A conductor pattern structure of a capacitive touch panel formed on a surface of a substrate, the conductor pattern structure comprising:

a plurality of first-axis conductor assemblies, each first-axis conductor assembly comprising a plurality of first-axis conductor cells arranged on the surface of the substrate along a first axis in a substantially equally-spaced manner, a disposition zone being delimited between adjacent ones of the first-axis conductor assemblies and between adjacent ones of the first-axis conductor cells;

a plurality of first-axis conduction lines respectively connecting between adjacent ones of the first-axis conductor cells of each first-axis conductor assembly so that the first-axis conductor cells of each respective first-axis conductor assembly are electrically connected together;

a plurality of insulation layers, each insulation layer of the plurality of insulation layers covering a surface of each first-axis conduction line without encompassing the adjacent first-axis conductor cells;

a plurality of second-axis conductor assemblies, each second-axis conductor assembly comprising a plurality of second-axis conductor cells arranged on the surface of the substrate along a second axis in a substantially equally-spaced manner, each second-axis conductor cell being set in each disposition zone;

a plurality of second-axis conduction lines respectively connecting between adjacent ones of the second-axis conductor cells of each second-axis conductor assembly so that

the second-axis conductor cells of each respective second-axis conductor assembly are electrically connected together, the second-axis conduction line being extended across a surface of the insulation layer of the respective first-axis conduction line,

wherein first-axis conductor cells and the second-axis conductor cells consist of a transparent conductive material.

2. (Previously presented) The conductor pattern structure as claimed in claim 1, wherein the first-axis conduction lines consist of a transparent conductive material.

3. (Previously presented) The conductor pattern structure as claimed in claim 1, wherein the second-axis conduction lines consist of a transparent conductive material.

4. (Original) The conductor pattern structure as claimed in claim 1, wherein the insulation layer consists of a transparent insulation material.

5. (Original) The conductor pattern structure as claimed in claim 1, wherein the first-axis conductor cells and the second-axis conductor cells have a contour of hexagonal shape.

6. (Previously presented) A conductor pattern structure of a capacitive touch panel formed on a surface of a substrate, the conductor pattern structure comprising:

at least two adjacent first-axis conductor cells; and

at least two adjacent second-axis conductor cells,

wherein the adjacent first-axis conductor cells are connected by a first-axis conduction line provided therebetween,

wherein an insulation layer is formed on a surface of the first-axis conduction line without encompassing the two adjacent first-axis conductor cells, and a second-axis conduction line extends across a surface of the insulation layer to connect between the adjacent second-axis conductor cells, and

wherein first-axis conductor cells and the second-axis conductor cells consist of a transparent conductive material.

7. (Previously presented) The conductor pattern structure as claimed in claim 6, wherein the first-axis conduction lines consist of a transparent conductive material.

8. (Previously presented) The conductor pattern structure as claimed in claim 6, wherein the second-axis conduction lines consist of a transparent conductive material.

9. (Original) The conductor pattern structure as claimed in claim 6, wherein the insulation layer consists of a transparent insulation material.

10. (Original) The conductor pattern structure as claimed in claim 6, wherein the first-axis conductor cells and the second-axis conductor cells have a contour of hexagonal shape.

11. (Previously presented) The conductor pattern structure as claimed in claim 1 further comprises a plurality of signal transmission lines formed on the surface of the substrate, each signal transmission line respectively connecting each first-axis conductor assembly and each second-axis conductor assembly.

12. (Previously presented) The conductor pattern structure as claimed in claim 11, wherein the first-axis conduction lines consist of a transparent conductive material.

13. (Previously presented) The conductor pattern structure as claimed in claim 11, wherein the second-axis conduction lines consist of a transparent conductive material.

14. (Previously presented) The conductor pattern structure as claimed in claim 11, wherein the insulation layer consists of a transparent insulation material.

15. (Previously presented) The conductor pattern structure as claimed in claim 11, wherein the first-axis conductor cells and the second-axis conductor cells have a contour of hexagonal shape.

16. (Previously presented) The conductor pattern structure as claimed in claim 11, wherein the transparent conductive material is Indium Tin Oxide (ITO).

17. (Currently amended) [The]A conductor pattern structure ~~as claimed in claim 11~~of a capacitive touch panel formed on a surface of a substrate, the conductor pattern structure comprising:

a plurality of first-axis conductor assemblies, each first-axis conductor assembly comprising a plurality of first-axis conductor cells arranged on the surface of the substrate along a first axis in a substantially equally-spaced manner, a disposition zone being delimited between adjacent ones of the first-axis conductor assemblies and between adjacent ones of the first-axis conductor cells;

a plurality of first-axis conduction lines respectively connecting between adjacent ones of the first-axis conductor cells of each first-axis conductor assembly so that the first-axis conductor cells of each respective first-axis conductor assembly are electrically connected together;

a plurality of insulation layers, each insulation layer of the plurality of insulation layers covering a surface of each first-axis conduction line without encompassing the adjacent first-axis conductor cells;

a plurality of second-axis conductor assemblies, each second-axis conductor assembly comprising a plurality of second-axis conductor cells arranged on the surface of the substrate along a second axis in a substantially equally-spaced manner, each second-axis conductor cell being set in each disposition zone;

a plurality of second-axis conduction lines respectively connecting between adjacent ones of the second-axis conductor cells of each second-axis conductor assembly so that the second-axis conductor cells of each respective second-axis conductor assembly are electrically connected together, the second-axis conduction line being extended across a surface of the insulation layer of the respective first-axis conduction line; and

a plurality of signal transmission lines formed on the surface of the substrate, each signal transmission line respectively connecting each first-axis conductor assembly and each second-axis conductor assembly,

wherein first-axis conductor cells and the second-axis conductor cells consist of a transparent conductive material, and

wherein a capacitance between a first cell of the plurality of first-axis conductor cells and a second cell of the plurality of second-axis conductor cells is measured to detect a position of touch.

18. (Previously presented) The conductor pattern structure as claimed in claim 17, wherein the first-axis conduction lines consist of a transparent conductive material.

19. (Previously presented) The conductor pattern structure as claimed in claim 17, wherein the second-axis conduction lines consist of a transparent conductive material.

20. (Previously presented) The conductor pattern structure as claimed in claim 17, wherein the insulation layer consists of a transparent insulation material.

21. (Previously presented) The conductor pattern structure as claimed in claim 17, wherein the first-axis conductor cells and the second-axis conductor cells have a contour of hexagonal shape.

22. (Previously presented) The conductor pattern structure as claimed in claim 17, wherein each second-axis conduction line terminates on the edge of each second-axis conductor cell to the adjacent second-axis conductor cells.

23. (Previously presented) The conductor pattern structure as claimed in claim 17, wherein the transparent conductive material is Indium Tin Oxide (ITO).

24. (Previously presented) The conductor pattern structure as claimed in claim 1, wherein each second-axis conduction line terminates on the edge of each second-axis conductor cell to the adjacent second-axis conductor cells.

25. (Currently amended) [The]A conductor pattern structure ~~as claimed in claim 1~~of a capacitive touch panel formed on a surface of a substrate, the conductor pattern structure comprising:

a plurality of first-axis conductor assemblies, each first-axis conductor assembly comprising a plurality of first-axis conductor cells arranged on the surface of the substrate along a first axis in a substantially equally-spaced manner, a disposition zone being delimited between adjacent ones of the first-axis conductor assemblies and between adjacent ones of the first-axis conductor cells;

a plurality of first-axis conduction lines respectively connecting between adjacent ones of the first-axis conductor cells of each first-axis conductor assembly so that the first-axis conductor cells of each respective first-axis conductor assembly are electrically connected together;

a plurality of insulation layers, each insulation layer of the plurality of insulation layers covering a surface of each first-axis conduction line without encompassing the adjacent first-axis conductor cells;

a plurality of second-axis conductor assemblies, each second-axis conductor assembly comprising a plurality of second-axis conductor cells arranged on the surface of the substrate along a second axis in a substantially equally-spaced manner, each second-axis conductor cell being set in each disposition zone; and

a plurality of second-axis conduction lines respectively connecting between adjacent ones of the second-axis conductor cells of each second-axis conductor assembly so that the second-axis conductor cells of each respective second-axis conductor assembly are electrically connected together, the second-axis conduction line being extended across a surface of the insulation layer of the respective first-axis conduction line,

wherein first-axis conductor cells and the second-axis conductor cells consist of a transparent conductive material, and

wherein a capacitance between a first cell of the plurality of first-axis conductor cells and a second cell of the plurality of second-axis conductor cells is measured to detect a position of touch.

26. (Previously presented) The conductor pattern structure as claimed in claim 25, wherein the first-axis conduction lines consist of a transparent conductive material.

27. (Previously presented) The conductor pattern structure as claimed in claim 25, wherein the second-axis conduction lines consist of a transparent conductive material.

28. (Previously presented) The conductor pattern structure as claimed in claim 25, wherein the insulation layer consists of a transparent insulation material.

29. (Previously presented) The conductor pattern structure as claimed in claim 25, wherein the first-axis conductor cells and the second-axis conductor cells have a contour of hexagonal shape.

30. (Previously presented) The conductor pattern structure as claimed in claim 25, wherein the transparent conductive material is Indium Tin Oxide (ITO).

31. (Previously presented) The conductor pattern structure as claimed in claim 1, wherein the transparent conductive material is Indium Tin Oxide (ITO).

32. (Previously presented) A method of constructing a conductor pattern structure of a capacitive touch panel, the method comprising:

forming a plurality of first-axis conductor cells on a surface of a substrate arranged along a first axis in a substantially equally-spaced manner,

forming a plurality of second-axis conductor cells on the surface of the substrate arranged along a second axis in a substantially equally-spaced manner;

electrically connecting adjacent ones of the first-axis conductor cells along the first-axis using a plurality of first-axis conduction lines to form a plurality of first-axis conductor assemblies, wherein each second-axis conductor cell is set in each disposition zone being delimited between adjacent ones of the first-axis conductor assemblies and between adjacent ones of the first-axis conductor cells;

forming a plurality of insulation layers covering a surface of each first-axis conduction line without encompassing the adjacent first-axis conductor cells; and

electrically connecting adjacent ones of the second-axis conductor cells along the second-axis using a plurality of second-axis conduction lines to form a plurality of second-axis conductor assemblies, each of the first-axis conductor cells and the second-axis conductor cells consisting of a transparent conductive material.

33. (Previously presented) The method of claim 32, wherein the first-axis conductor cells, the second-axis conductor cells and the first-axis conduction lines are formed simultaneously.

34. (Previously presented) The method of claim 32 further comprising forming a plurality of signal transmission lines on the surface of the substrate, each signal transmission line respectively connecting each first-axis conductor assembly and each second-axis conductor assembly.

35. (Currently amended) [The]A method of ~~claim 32 further comprising~~ constructing a conductor pattern structure of a capacitive touch panel, the method comprising:

forming a plurality of first-axis conductor cells on a surface of a substrate arranged along a first axis in a substantially equally-spaced manner,

forming a plurality of second-axis conductor cells on the surface of the substrate arranged along a second axis in a substantially equally-spaced manner;

electrically connecting adjacent ones of the first-axis conductor cells along the first-axis using a plurality of first-axis conduction lines to form a plurality of first-axis conductor assemblies, wherein each second-axis conductor cell is set in each disposition zone being delimited between adjacent ones of the first-axis conductor assemblies and between adjacent ones of the first-axis conductor cells;

forming a plurality of insulation layers covering a surface of each first-axis conduction line without encompassing the adjacent first-axis conductor cells;

electrically connecting adjacent ones of the second-axis conductor cells along the second-axis using a plurality of second-axis conduction lines to form a plurality of second-axis conductor assemblies, each of the first-axis conductor cells and the second-axis conductor cells consisting of a transparent conductive material; and

measuring a capacitance between a first cell of the plurality of first-axis conductor cells and a second cell of the plurality of second-axis conductor cells to detect a position of touch.

36. (Previously presented) The method of claim 32, wherein the first-axis conduction lines consist of a transparent conductive material.

37. (Previously presented) The method of claim 32, wherein the second-axis conduction lines consist of a transparent conductive material.

38. (Previously presented) The method of claim 32, wherein the insulation layer consists of a transparent insulation material.

39. (Previously presented) The method of claim 32, wherein the first-axis conductor cells and the second-axis conductor cells have a contour of hexagonal shape.

40. (Previously presented) The method of claim 32, wherein each second-axis conduction line terminates on the edge of each second-axis conductor cell to the adjacent second-axis conductor cells.

41. (Previously presented) The method of claim 32, wherein the transparent conductive material is Indium Tin Oxide (ITO).

42. (Previously presented) A method of constructing a conductor pattern structure of a capacitive touch panel, the method comprising:

forming a plurality of first-axis conductor cells on a surface of a substrate arranged along a first axis in a substantially equally-spaced manner, wherein each first-axis conductor cell is separated by each disposition zone between adjacent ones of the first-axis conductor cells;

electrically connecting adjacent ones of the first-axis conductor cells along the first-axis using a plurality of first-axis conduction lines to form a plurality of first-axis conductor assemblies;

forming a plurality of insulation layers covering a surface of each first-axis conduction line without encompassing the adjacent first-axis conductor cells;

forming a plurality of second-axis conductor cells in each disposition zone between adjacent ones of the first-axis conductor cells on the surface of the substrate arranged along a second axis in a substantially equally-spaced manner; and

electrically connecting adjacent ones of the second-axis conductor cells along the second-axis using a plurality of second-axis conduction lines to form a plurality of second-axis conductor assemblies, each of the first-axis conductor cells and the second-axis conductor cells consisting of a transparent conductive material.

43. (Previously presented) The method of claim 42 further comprising forming a plurality of signal transmission lines on the surface of the substrate, each signal transmission line respectively connecting each first-axis conductor assembly and each second-axis conductor assembly.

44. (Currently amended) [The]A method of ~~claim 42 further comprising~~ constructing a conductor pattern structure of a capacitive touch panel, the method comprising:

forming a plurality of first-axis conductor cells on a surface of a substrate arranged along a first axis in a substantially equally-spaced manner, wherein each first-axis conductor cell is separated by each disposition zone between adjacent ones of the first-axis conductor cells;

electrically connecting adjacent ones of the first-axis conductor cells along the first-axis using a plurality of first-axis conduction lines to form a plurality of first-axis conductor assemblies;

forming a plurality of insulation layers covering a surface of each first-axis conduction line without encompassing the adjacent first-axis conductor cells;

forming a plurality of second-axis conductor cells in each disposition zone between adjacent ones of the first-axis conductor cells on the surface of the substrate arranged along a second axis in a substantially equally-spaced manner;

electrically connecting adjacent ones of the second-axis conductor cells along the second-axis using a plurality of second-axis conduction lines to form a plurality of second-axis conductor assemblies, each of the first-axis conductor cells and the second-axis conductor cells consisting of a transparent conductive material; and

measuring a capacitance between a first cell of the plurality of first-axis conductor cells and a second cell of the plurality of second-axis conductor cells to detect a position of touch.

45. (Previously presented) The method of claim 42, wherein the transparent conductive material is Indium Tin Oxide (ITO).

46. (New) A conductor pattern structure of a capacitive touch panel formed on a surface of a rigid substrate, the conductor pattern structure comprising:

a plurality of first-axis conductor assemblies, each first-axis conductor assembly comprising a plurality of first-axis conductor cells arranged on the surface of the rigid substrate along a first axis in a substantially equally-spaced manner, a disposition zone being delimited between adjacent ones of the first-axis conductor assemblies and between adjacent ones of the first-axis conductor cells;

a plurality of first-axis conduction lines respectively connecting between adjacent ones of the first-axis conductor cells of each first-axis conductor assembly so that the first-axis conductor cells of each respective first-axis conductor assembly are electrically connected together;

a plurality of insulation layers, each insulation layer of the plurality of insulation layers covering a surface of each first-axis conduction line without encompassing the adjacent first-axis conductor cells;

a plurality of second-axis conductor assemblies, each second-axis conductor assembly comprising a plurality of second-axis conductor cells arranged on the surface of the rigid substrate along a second axis in a substantially equally-spaced manner, each second-axis conductor cell being set in each disposition zone;

a plurality of second-axis conduction lines respectively connecting between adjacent ones of the second-axis conductor cells of each second-axis conductor assembly so that the second-axis conductor cells of each respective second-axis conductor assembly are electrically connected together, the second-axis conduction line being extended across a surface of the insulation layer of the respective first-axis conduction line,

wherein first-axis conductor cells and the second-axis conductor cells consist of a transparent conductive material.

47. (New) The conductor pattern structure as claimed in claim 46, wherein the first-axis conduction lines consist of a transparent conductive material.

48. (New) The conductor pattern structure as claimed in claim 46, wherein the second-axis conduction lines consist of a transparent conductive material.

49. (New) The conductor pattern structure as claimed in claim 46, wherein the insulation layer consists of a transparent insulation material.

50. (New) The conductor pattern structure as claimed in claim 46, wherein the first-axis conductor cells and the second-axis conductor cells have a contour of hexagonal shape.

51. (New) The conductor pattern structure as claimed in claim 46 further comprises a plurality of signal transmission lines formed on the surface of the rigid substrate, each signal transmission line respectively connecting each first-axis conductor assembly and each second-axis conductor assembly.

52. (New) The conductor pattern structure as claimed in claim 46, wherein each second-axis conduction line terminates on the edge of each second-axis conductor cell to the adjacent second-axis conductor cells.

53. (New) A conductor pattern structure of a capacitive touch panel formed on a surface of a rigid substrate, the conductor pattern structure comprising:

at least two adjacent first-axis conductor cells; and

at least two adjacent second-axis conductor cells,

wherein the adjacent first-axis conductor cells are connected by a first-axis conduction line provided therebetween,

wherein an insulation layer is formed on a surface of the first-axis conduction line without encompassing the two adjacent first-axis conductor cells, and a second-axis conduction line extends across a surface of the insulation layer to connect between the adjacent second-axis conductor cells, and

wherein first-axis conductor cells and the second-axis conductor cells consist of a transparent conductive material.

54. (New) The conductor pattern structure as claimed in claim 53, wherein the first-axis conduction lines consist of a transparent conductive material.

55. (New) The conductor pattern structure as claimed in claim 53, wherein the second-axis conduction lines consist of a transparent conductive material.

56. (New) The conductor pattern structure as claimed in claim 53, wherein the insulation layer consists of a transparent insulation material.

57. (New) The conductor pattern structure as claimed in claim 53, wherein the first-axis conductor cells and the second-axis conductor cells have a contour of hexagonal shape.

58. (New) A method of constructing a conductor pattern structure of a capacitive touch panel, the method comprising:

forming a plurality of first-axis conductor cells on a surface of a rigid substrate arranged along a first axis in a substantially equally-spaced manner,

forming a plurality of second-axis conductor cells on the surface of the rigid substrate arranged along a second axis in a substantially equally-spaced manner;

electrically connecting adjacent ones of the first-axis conductor cells along the first-axis using a plurality of first-axis conduction lines to form a plurality of first-axis conductor assemblies, wherein each second-axis conductor cell is set in each disposition zone being delimited between adjacent ones of the first-axis conductor assemblies and between adjacent ones of the first-axis conductor cells;

forming a plurality of insulation layers covering a surface of each first-axis conduction line without encompassing the adjacent first-axis conductor cells; and

electrically connecting adjacent ones of the second-axis conductor cells along the second-axis using a plurality of second-axis conduction lines to form a plurality of second-axis conductor assemblies, each of the first-axis conductor cells and the second-axis conductor cells consisting of a transparent conductive material.

59. (New) The method of claim 58, wherein the first-axis conductor cells, the second-axis conductor cells and the first-axis conduction lines are formed simultaneously.

60. (New) The method of claim 58 further comprising forming a plurality of signal transmission lines on the surface of the rigid substrate, each signal transmission line respectively connecting each first-axis conductor assembly and each second-axis conductor assembly.

61. (New) The method of claim 58, wherein the first-axis conduction lines consist of a transparent conductive material.

62. (New) The method of claim 58, wherein the second-axis conduction lines consist of a transparent conductive material.

63. (New) The method of claim 58, wherein the insulation layer consists of a transparent insulation material.

64. (New) The method of claim 58, wherein the first-axis conductor cells and the second-axis conductor cells have a contour of hexagonal shape.

65. (New) The method of claim 58, wherein each second-axis conduction line terminates on the edge of each second-axis conductor cell to the adjacent second-axis conductor cells.

66. (New) A method of constructing a conductor pattern structure of a capacitive touch panel, the method comprising:

forming a plurality of first-axis conductor cells on a surface of a rigid substrate arranged along a first axis in a substantially equally-spaced manner, wherein each first-axis conductor cell is separated by each disposition zone between adjacent ones of the first-axis conductor cells;

electrically connecting adjacent ones of the first-axis conductor cells along the first-axis using a plurality of first-axis conduction lines to form a plurality of first-axis conductor assemblies;

forming a plurality of insulation layers covering a surface of each first-axis conduction line without encompassing the adjacent first-axis conductor cells;

forming a plurality of second-axis conductor cells in each disposition zone between adjacent ones of the first-axis conductor cells on the surface of the rigid substrate arranged along a second axis in a substantially equally-spaced manner; and

electrically connecting adjacent ones of the second-axis conductor cells along the second-axis using a plurality of second-axis conduction lines to form a plurality of second-axis conductor assemblies, each of the first-axis conductor cells and the second-axis conductor cells consisting of a transparent conductive material.

67. (New) The method of claim 66 further comprising forming a plurality of signal transmission lines on the surface of the rigid substrate, each signal transmission line

respectively connecting each first-axis conductor assembly and each second-axis conductor assembly.

68. (New) A method of constructing a conductor pattern structure of a capacitive touch panel, the method comprising:

forming a plurality of first-axis conductor cells on a surface of a rigid substrate arranged along a first axis in a substantially equally-spaced manner, wherein each first-axis conductor cell is separated by each disposition zone between adjacent ones of the first-axis conductor cells;

electrically connecting adjacent ones of the first-axis conductor cells along the first-axis using a plurality of first-axis conduction lines to form a plurality of first-axis conductor assemblies;

forming a plurality of insulation layers covering a surface of each first-axis conduction line without encompassing the adjacent first-axis conductor cells;

forming a plurality of second-axis conductor cells in each disposition zone between adjacent ones of the first-axis conductor cells on the surface of the rigid substrate arranged along a second axis in a substantially equally-spaced manner;

electrically connecting adjacent ones of the second-axis conductor cells along the second-axis using a plurality of second-axis conduction lines to form a plurality of second-axis conductor assemblies, each of the first-axis conductor cells and the second-axis conductor cells consisting of a transparent conductive material; and

measuring a capacitance between a first cell of the plurality of first-axis conductor cells and a second cell of the plurality of second-axis conductor cells to detect a position of touch.

REMARKS

Claims 1-45 are pending.

Claims 1-4, 6-9, 11-14, 16-20, 22-28, 30-38, and 40-45 are rejected under 35 U.S.C. §102(b) as being anticipated by U.S. Patent Pub. No. 2005/0030048 by Bolender, *et al.* ("Bolender").

Claims 5, 10, 15, 21, 29, and 39 are rejected under 35 U.S.C. §103(a) as being unpatentable over Bolender in view of U.S. Patent Pub. No. 2004/0119701 by Mulligan, *et al.* ("Mulligan").

Claims 17, 25, 35, and 44 have been rewritten in independent form including all of the limitation of their respective base claims. These amendments are believed to place the claims in condition for allowance and in any event in better condition for consideration on appeal.

Claims 46-68 have been newly added.

Applicant respectfully requests entry of this amendment and reconsideration of the application in view of the foregoing amendments and the following.

CLAIM REJECTIONS

I. Rejections Under 35 U.S.C. § 102(b)

The Examiner rejected claims 1-4, 6-9, 11-14, 16-20, 22-28, 30-38, and 40-45 under 35 U.S.C. §102(b) as being anticipated by Bolender. 12/21/10 Final Office Action, p. 2. Applicant respectfully traverses the Examiner's rejection of claims 1-4, 6-9, 11-14, 16-20, 22-28, 30-38, and 40-45 for at least the following reasons.

Bolender discloses a capacitive sensing device including a single sheet capacitive sensor configured to be disposed within a keypad assembly. Bolender, Abstract.

Bolender teaches a structure of the capacitive sensor that uses a combination of a transparent or substantially transparent conductive material ***and*** an **opaque or substantially opaque material**. Emphasis added. For example, with reference to Figure 2, Bolender describes the structure as follows:

> a single layer of substantially transparent conductive material, e.g., indium tin oxide (ITO), and an extra layer of ***substantially opaque conductive material*** (e.g., silver ink, carbon ink, a mixture of silver and carbon inks, etc.) that protects the substantially transparent conductive material against cracking during manufacture and/or repetitive use. Since the ***substantially opaque conductive material*** application is also a redundant electrical path, it can be selectively disposed where desired.

Bolender, ¶ [0026], emphasis added. Further, with respect to Figure 4, Bolender makes clear that every capacitive "cell" includes at least some opaque material overlying it, thereby providing the ability to illuminate the keys underneath and provide the capacitive sensing:

> FIG. 4 is a diagram of an exemplary capacitive sensing device 400 that illustrates selective disposing of ***substantially opaque conductive material*** in accordance with an embodiment of the present invention. It is noted that capacitive sensing device 400 can be fabricated in a manner similar to capacitive sensor patterns 300A and 300B of FIGS. 3A and 3B, respectively, as described herein. The ***solid lines of capacitive sensing device 400 represent the substantially opaque conductive material*** while the dashed lines represent the underlying substantially transparent conductive material within an "illumination" opening 402 of capacitive sensing device 400. In this manner, light is able to pass through opening 402 of capacitive sensing device 400 in order to illuminate one or more keys (e.g., 204) of a keypad (e.g., 206) associated with an electronic device (e.g., 100) while still providing capacitive sensing capabilities within opening 402 via the existing substantially transparent conductive material. It is understood that the underlying substantially transparent conductive material extends beneath ***the substantially opaque conductive material***.

Bolender, ¶ [0042], emphasis added. Indeed, a careful reading of the Bolender specification and drawings reveals that every capacitive sensing device has some **opaque or substantially opaque**

conductive material. *See, e.g.,* Bolender ¶¶ [0030], [0031], [0034], [0037]-[0055], [0060], [0061], and [0066]-[0068].

From the foregoing, a person of ordinary skill in the art would recognize that Bolender's capacitive "cells" are made to be at least in part **opaque or substantially opaque**. This is further evidenced by Bolender's requirement for an "opening" 402 through which light passes to illuminate the keys 204. *See* Bolender, Figures 2, 4, and 9; ¶¶ [0042]-[0043], [0060]-[0061]. In order to form the light-passing opening 402, **substantially opaque conductive material** is "selectively" disposed and the capacitive "cells" are specially shaped to form partial diamonds 308a, 320a, 314a and 326a. *Id.* Stated otherwise, if Bolender's capacitive "cells" were made of only transparent material, no such opening 402 would be necessary because light passes through the entirely transparent capacitive "cells". *See* Bolender, ¶ [0026].

It is well known that a prior art reference must be considered in its entirety, *i.e.*, <u>as a whole</u>, including portions that would lead away from the claimed invention. *W.L. Gore & Associates, Inc. v. Garlock, Inc.*, 721 F.2d 1540, 220 USPQ 303 (Fed. Cir. 1983), *cert. denied*, 469 U.S. 851 (1984). MPEP § 2141.02 (VI).

In contrast, claim 1 requires that the "**first-axis conductor cells and the second-axis conductor cells <u>consist of a transparent conductive material</u>**." Emphasis added. The same or a similar limitation is found in each independent claim 6, 17, 25, 32, 35, 42, and 44. Bolender does not, however, disclose such a conductor cell structure. Rather, as noted above, the structure in Bolender corresponding to a conductor cell is made of a multi layer conductive structure having [1] a transparent or substantially transparent layer that extends underneath and **<u>[2]</u>** an **opaque or a substantially opaque layer**, the latter being printed over at least part of the transparent or substantially transparent layer. Nowhere does Bolender disclose conductor cells that "**consist of a transparent conductive material**," as called for in each of Applicant's independent claims. Instead, each of Bolender's capacitive "cells" contains an **opaque or substantially opaque layer** as part of the conductor structure to "selectively" illuminate the keys for enabling conventional use of the keys. *See* Bolender, ¶¶ [0021], [0023]. Bolender explains that the opaque coating is useful to protect the underlying transparent conductive material. *See* Bolender, ¶¶ [0023], [0038]. Indeed, this difference can be attributed to the fact that Bolender addresses a different technical problem, that of <u>a keypad assembly</u>, for example, of a mobile phone, including a conventional switch sensor 214 for detecting user's depression of keys (thus "selective" or "partial" transparency/opacity is required) and an integrated capacitive sensor 208 for detecting user's finger motion over keypad region 106 (*See* Bolender, Abstract, Figures 1 and 2; ¶¶ [0001], [0021]). Applicant's invention on the other hand addresses "**a capacitive touch panel**" having capacitive cells consisting of a transparent conductive material (*See* Claim 1). Accordingly, Bolender does not disclose every limitation of claim 1, and similarly the other independent claims, and the claims depending therefrom.

For these reasons, Applicant respectfully submits that claim 1 and claims 2-4, 11-14, 16-20, 22-28, 30, and 31 that depend from claim 1 are NOT anticipated under 35 U.S.C. §102(b) by Bolender and requests withdrawal of the rejections.

Regarding claim 11, the Examiner stated that Bolender discloses that the conductor pattern structure comprises "**a plurality of signal transmission lines <u>formed on the surface of the substrate</u>**." 12/21/10 Final Office Action, p. 6, emphasis added. Applicant respectfully traverses this rejection for the following reasons.

A careful reading of the Examiner's cited paragraphs [0036] and [0035] and Figures 3A and 3B (*See Id*) reveals that Bolender does NOT disclose a plurality of signal transmission lines, particularly any signal transmission line of the plurality of signal transmission lines is "**formed on the surface of the substrate**" and "**respectively connecting each first-axis conductor assembly and each second-axis conductor assembly**," as claim 11 recites. Instead, Bolender merely shows the capacitive sensor traces are connected to each other to form *separate* capacitive sensor patterns. *See* Bolender, Figures 3A and 3B.

In fact, there are many different designs and structures available for connecting capacitive sensor traces and patterns in a touch pad design depending on the system requirements and specific applications that the designs and structures are intended for. For example, Seely (U.S. Patent No. 6,188,391) that the Examiner relied upon in the previous Office Action dated June 25, 2010, discloses that the transmission lines are NOT formed on the same substrate as the sensor electrodes. Given that many different designs and structures are available for connecting capacitive sensor traces and patterns, Applicant respectfully submits that a person having ordinary skill in the art after reading Bolender would fail to recognize that Bolender discloses "**a plurality of signal transmission lines formed on the surface of the substrate**" and "**each signal transmission line respectively connect[s] each first-axis conductor assembly and each second-axis conductor assembly**."

At least for these independent reasons, Applicant respectfully submits that claim 11 and claims 12-16 that depend from claim 11 are NOT anticipated under 35 U.S.C. 102(b) by Bolender and requests withdrawal of the rejections of claims 11-16.

Claims 17, 34, and 43 also recite "**a plurality of signal transmission lines formed on the surface of the substrate**" and "**each signal transmission line respectively connecting each first-axis conductor assembly and each second-axis conductor assembly**."

For the reasons set forth regarding claim 11, Applicant respectfully submits that claims 17 and claims 18-23 that depend from claim 17, and claims 34 and 43 are NOT anticipated under 35 U.S.C. 102(b) by Bolender and requests withdrawal of the rejections of claims 17-23, 34, and 43.

Further regarding claim 17 that depends from claim 1 (and as amended is rewritten in independent form), the Examiner stated that Bolender in paragraph [0029] discloses the claimed feature that "**a capacitance <u>between a first cell of the plurality of first-axis cells and a second cell of the plurality of second-axis cells</u> is measured to detect a position of touch**." 12/21/10 Final Office Action, p. 7, emphasis added. Applicant respectfully disagrees for the following reasons.

The paragraph [0029] of Bolender cited by the Examiner describes:

> FIG. 3A is a diagram of <u>an intermediate step in constructing an exemplary capacitive sensor</u> 300A that includes a first capacitive sensor pattern 302 and a second capacitive sensor pattern 304 in accordance with an embodiment of the present invention for a capacitive sensing device. For example, <u>capacitive sensor pattern 302 includes electrically coupled horizontal capacitive sensor traces while capacitive sensor pattern 304 includes the as yet electrically uncoupled vertical sensor traces</u>.

Bolender, ¶ [0029], emphasis added.

Contrary to the Examiner's assertion, however, nowhere in paragraph [0029] does Bolender disclose how a capacitance is sensed by any sensing circuitry or how the user's finger motion is recognized by the character recognition circuitry (*See* Bolender, ¶¶ [0021], [0024], [0032]); nor is there a detailed explanation of whether or not "**a capacitance <u>between a first cell of the plurality of first-axis cells and a second cell of the plurality of second-axis cells</u> is measured**." Claim 17, emphasis added. Instead, Bolender in paragraph [0029] merely describes the construction steps of its sensor patterns including capacitive sensor pattern 302 including electrically coupled horizontal capacitive sensor traces and capacitive sensor pattern 304 including electrically uncoupled vertical capacitive sensor traces. In addition, Bolender fails to explicitly disclose how the capacitive sensing circuitry is coupled to the capacitive sensor traces (i.e., cells) of the capacitive sensor patterns 302 and 304 and how the user's finger motion is detected. Even after the electrically isolated vertical capacitive sensor traces are coupled to each other using conductive bridges, for example, items 352 and 354 (*See* Bolender, Figure 3B; ¶ [0035]), the vertical and horizontal capacitive sensor patterns 302 and 304 would be ***still electrically isolated*** from each other.

Therefore, Applicant respectfully submits that the Examiner's reliance on and interpretation of Bolender's paragraph [0029] for rejecting claim 17 is misplaced or at least irrelevant to the feature of "**a capacitance <u>between a first cell of the plurality of first-axis conductor cells and a second cell of the plurality of second-axis conductor cells</u> is measured to detect a position of touch**," as required by claim 17.

Furthermore, it bears mention that Bolender recognized the technical difficulties of a conventional keypad assembly design that requires key post holes through a capacitance sensor underneath the keypad. In addition, Bolender recognized the requirement for a lot of compensation in the sensing circuitry of the capacitive sensor due to the irregular sensor design due to the key post through holes (*See* Bolender, Abstract; ¶ [0002]). In order to overcome these technical difficulties and requirement for compensation, Bolender proposed a new keypad assembly design with an integrated capacitive sensor formed onto a **flexible and deformable** substrate with odd shaped sensing areas (*e.g.*, 308a, 320a, 314a, 326a) for back lighting illumination and conductive bridges disposed in a specific orientation and location such that the **substantially opaque conductive material** used in the structure is tailored to <u>minimize the</u>

capacitive interferences. *See* Bolender, Figures 4 and 9; ¶¶ [0026], [0043], [0061], emphasis added. If the capacitive interference between capacitive sensor patterns and the conductive bridges need to be minimized, then a person of ordinary skill in the art would recognize that the capacitive interference between the horizontal capacitive sensor patterns and the vertical capacitive sensor patterns needs to be minimized as well, if not completely eliminated.

Applicant respectfully submits that these teachings of Bolender are fundamentally different from the claimed feature in claim 17 that recites "**a plurality of first-axis conductor cells arranged on the surface of the substrate**," "**a plurality of second-axis conductor cells arranged on the surface of the substrate**," and that "**a capacitance between a first cell of the plurality of first-axis cells and a second cell of the plurality of second-axis cells is measured**." In fact, Applicant respectfully submits that the listed inventors of the present application are the first to have recognized the advantages of, succeeded in achieving, and claimed, to arrange "**a plurality of first-axis conductor cells**" and "**a plurality of second-axis conductor cells [] on the surface of the [same] substrate**," and to measure "**a capacitance between a first cell of the plurality of first-axis cells and a second cell of the plurality of second-axis cells**," notwithstanding the existence of the technical difficulties and interference issues as Bolender contemplates.

Claims 25, 35, and 44 also recite "**a plurality of first-axis conductor cells arranged on the surface of the substrate**," "**a plurality of second-axis conductor cells arranged on the surface of the substrate**," and that "**a capacitance between a first cell of the plurality of first-axis cells and a second cell of the plurality of second-axis cells is measured**," as in claim 17.

For this reason, Applicant respectfully submits that claims 17, 25, 35, and 44 and claims 18-23 and 26-30 that respectively depend from claims 17 and 25 are NOT anticipated under 35

U.S.C. 102(b) by Bolender and requests withdrawal of the rejections of claims 17-23, 25-30, 35, and 44.

It is also noted that claims 17, 25, 35, and 44 have been rewritten in independent form to place them in allowable condition or at least in better condition for consideration on appeal, including all of the limitations of the base claims. Applicant respectfully requests that the patentability of claims 17, 25, 35, and 44 be examined independently and separately from the rejected claims 1, 32, and 42.

Turning to newly added independent claim 46, it recites among other things "**a <u>rigid</u> substrate**." In this regard, Bolender discloses that to overcome the technical difficulties and requirement for compensation, a new keypad assembly design with an integrated capacitive sensor is to be formed onto a **flexible and deformable** substrate. Bolender, Figure 2; ¶ [0023], emphasis added. Thanks to the flexibility of the substrate and the sensing patterns 302 and 304 formed thereon (*See* Bolender, Figures 3A and 3B), the keymat 210 of the keypad assembly 200 is deformed by a touch of a user to depress and actuate the switch sensors 214 positioned below the keymat 210 via key posts 212. *See* Bolender, Figure 2. In this manner, when a user finger 202 exerts a downward force on one of keys 204, the key 204 is depressed which in turn causes the deformation of capacitive sensor 208 along with keymat 210. Bolender, ¶ [0024]. The depression of the key 204 further provides <u>tactile "clicking" feedback</u> to the user. Bolender, ¶ [0021], emphasis added.

Bolender further illustrates the requirement for a thin and flexible capacitive sensor 208 to enable the desired tactile response during the use of keys of the keypad assembly. Bolender, Figure 10 shown below; ¶ [0063].

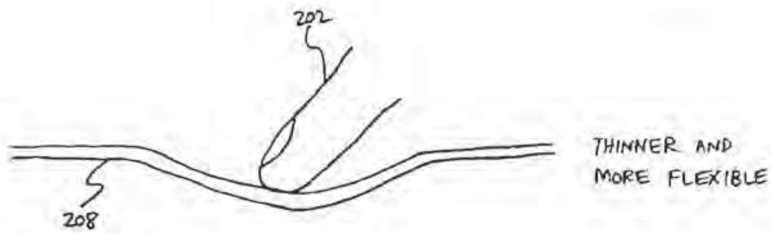

FIG. 10

It is well known that a prior art reference must be considered in its entirety, *i.e.*, as a whole, including portions that would lead away from the claimed invention. *W.L. Gore & Associates, Inc. v. Garlock, Inc.*, 721 F.2d 1540, 220 USPQ 303 (Fed. Cir. 1983), *cert. denied*, 469 U.S. 851 (1984). MPEP § 2141.02 (VI).

Applicant respectfully submits that newly added independent claim 46 is patentable over Bolender because it not only fails to disclose "**a rigid substrate**," but instead teaches the exact opposite of what is called for in claim 46 because Bolender requires a flexible and deformable substrate. *See* above. If Bolender's flexible substrate were for any reason substituted with a rigid substrate, Bolender's capacitive sensor would fail to provide the required depression of the switch sensor 214 positioned below of the capacitive sensor 208 let alone failing to provide tactile "clicking" feedback to the user. *Id.*

Other newly added independent claims 53, 58, 66, and 68 also recite "**a rigid substrate**." Therefore, for the reasons set forth regarding claim 46, Applicant respectfully submits that claims 46, 53, 58, 66, and 68 and claims 47-52, 54-57, 59-65, and 67 that depend from claims 46, 53, 58, and 66 are NEITHER anticipated under 35 U.S.C. §102(b) by Bolender.

II. Rejections Under 35 U.S.C. § 103(a)

The Examiner rejected claims 5, 10, 15, 21, 29, and 39 under 35 U.S.C. §103(a) as being unpatentable over Bolender in view of Mulligan. 12/21/10 Final Office Action, p. 15.

For the reasons set forth regarding claims 1, 6, and 32 and the dependency therefrom, claims 5, 10, 15, 21, 29, and 39 are also patentable under 35 U.S.C. §103(a) over Bolender.

Mulligan does not cure the above-noted deficiencies of claims 5, 10, 15, 21, 29, and 39. Mulligan discloses a touch-sensitive screen 210 having a touch pane layer 220 manufactured from a <u>chemically strengthened glass</u>. Mulligan, Figure 2; ¶ [0025]. As discussed above, Bolender's capacitive sensing device has a <u>flexible substrate</u>. *See* Bolender, Figure 2; ¶ [0023].

If proposed modification would render the prior art invention being modified **unsatisfactory for its intended purpose**, then there is no suggestion or motivation to make the proposed modification. *In re Gordon*, 733 F.2d 900, 221 USPQ 1125 (Fed. Cir. 1984). MPEP § 2143.01 (V).

Bolender's capacitive sensing device requires being flexible enough to deform the keymat 210, depress the switch sensor 214, and provide tactile feedback to the user. *See* Bolender, Figure 2; ¶¶ [0021], [0024]. Therefore, if Bolender's capacitive sensing device is modified to have a chemically strengthened glass (substrate), then the modification would render Bolender unsatisfactory for its intended purpose of being flexible.

From the foregoing, Bolender and Mulligan cannot be combined to teach or suggest the features of claims 1 and 32 from which claims 5, 10, 15, 21, 29, and 39 depend. Therefore, Applicant respectfully submits that claims 5, 10, 15, 21, 29, and 39 are patentable under 35 U.S.C. §103(a) over Bolender and Mulligan.

CONCLUSION

Applicant respectfully submits that it has made a patentable contribution to the art. Reconsideration of this application in view of the foregoing remarks, entry of the amendment, and withdrawal of the Examiner's rejections are respectfully requested.

The Examiner is invited to call Applicant's undersigned representative if doing so would expedite prosecution.

Date: February 22, 2011

Respectfully submitted,

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Electronic Patent Application Fee Transmittal

Application Number:	11842747
Filing Date:	21-Aug-2007
Title of Invention:	CONDUCTOR PATTERN STRUCTURE OF CAPACITIVE TOUCH PANEL
First Named Inventor/Applicant Name:	Ching-Yang Chang
Filer:	Sanjeet Kumar Dutta/Susan Principe
Attorney Docket Number:	22271.4002

Filed as Large Entity

Utility under 35 USC 111(a) Filing Fees

Description	Fee Code	Quantity	Amount	Sub-Total in USD($)
Basic Filing:				
Pages:				
Claims:				
Claims in excess of 20	1202	23	52	1196
Independent claims in excess of 3	1201	9	220	1980
Miscellaneous-Filing:				
Petition:				
Patent-Appeals-and-Interference:				
Post-Allowance-and-Post-Issuance:				

Description	Fee Code	Quantity	Amount	Sub-Total in USD($)
Extension-of-Time:				
Miscellaneous:				
		Total in USD ($)		**3176**

Electronic Acknowledgement Receipt

EFS ID:	9495341
Application Number:	11842747
International Application Number:	
Confirmation Number:	3897
Title of Invention:	CONDUCTOR PATTERN STRUCTURE OF CAPACITIVE TOUCH PANEL
First Named Inventor/Applicant Name:	Ching-Yang Chang
Customer Number:	34313
Filer:	Sanjeet Kumar Dutta/Susan Principe
Filer Authorized By:	Sanjeet Kumar Dutta
Attorney Docket Number:	22271.4002
Receipt Date:	22-FEB-2011
Filing Date:	21-AUG-2007
Time Stamp:	16:56:34
Application Type:	Utility under 35 USC 111(a)

Payment information:

Submitted with Payment	yes
Payment Type	Deposit Account
Payment was successfully received in RAM	$3176
RAM confirmation Number	4063
Deposit Account	150665
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The Director of the USPTO is hereby authorized to charge indicated fees and credit any overpayment as follows:

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Document Number	Document Description	File Name	File Size(Bytes)/ Message Digest	Multi Part /.zip	Pages (if appl.)
1		4002AmendaftFinal_2_22_2011.pdf	362618 36f4aefbad0521175a971029ad15e927e6a5e4e3	yes	33

Multipart Description/PDF files in .zip description		
Document Description	**Start**	**End**
Miscellaneous Incoming Letter	1	2
Amendment After Final	3	33

Warnings:

Information:

Document Number	Document Description	File Name	File Size(Bytes)/ Message Digest	Multi Part /.zip	Pages (if appl.)
2	Fee Worksheet (PTO-875)	fee-info.pdf	31796 8c829dfc074392e2108c04527e99690db08da6e8	no	2

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Total Files Size (in bytes):	394414

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<u>New Applications Under 35 U.S.C. 111</u>
If a new application is being filed and the application includes the necessary components for a filing date (see 37 CFR 1.53(b)-(d) and MPEP 506), a Filing Receipt (37 CFR 1.54) will be issued in due course and the date shown on this Acknowledgement Receipt will establish the filing date of the application.

<u>National Stage of an International Application under 35 U.S.C. 371</u>
If a timely submission to enter the national stage of an international application is compliant with the conditions of 35 U.S.C. 371 and other applicable requirements a Form PCT/DO/EO/903 indicating acceptance of the application as a national stage submission under 35 U.S.C. 371 will be issued in addition to the Filing Receipt, in due course.

<u>New International Application Filed with the USPTO as a Receiving Office</u>
If a new international application is being filed and the international application includes the necessary components for an international filing date (see PCT Article 11 and MPEP 1810), a Notification of the International Application Number and of the International Filing Date (Form PCT/RO/105) will be issued in due course, subject to prescriptions concerning national security, and the date shown on this Acknowledgement Receipt will establish the international filing date of the application.

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Appl. No.	:	11/842,747	Confirmation No.:	3897
Applicants	:	Ching-Yang Chang, *et al.*		
Filing Date	:	August 21, 2007		
Title	:	Conductor Pattern Structure Of Capacitive Touch Panel		
Group Art Unit	:	2629		
Examiner	:	Hicks, Charles V.		
Docket No.	:	22271-4002		
Customer No.	:	34313		

Commissioner For Patents
Mail Stop Missing Parts
P.O. Box 1450
Alexandria, VA 22313-1450

Dear Sir/Madam:

In response to the Final Office Action dated December 21, 2010, transmitted herewith is an Amendment and Response for the above-identified application.

ADDITIONAL PAPERS ENCLOSED:

☐ Information Disclosure Statement

The fees for claims (37 CFR § 1.16(b)-(d)) have been calculated as shown below

FEES FOR CLAIMS:

☒ Applicant claims small entity status pursuant to 37 CFR 1.27.

☒ Charge Orrick, Herrington & Sutcliffe LLP's Deposit Account No. **15-0665** in the amount of **$3176.00** to cover any fees as shown below:

9 Additional Independent Claim @ $220 per claim	1980.00
23 Additional Dependent Claims @ $52 per claim	1196.00
Total	$ 3176.00

☒ The Commissioner is authorized to charge Orrick, Herrington & Sutcliffe LLP's Deposit Account No. **15-0665** for any fees required under 37 CFR §§ 1.16 and 1.17 that are not covered, in whole or in part, by a check enclosed herewith and to credit any overpayments to said Deposit Account **15-0665**.

Respectfully submitted,

Orrick, Herrington & Sutcliffe LLP

Dated: February 22, 2011

By: ______________________
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PTO/SB/06 (07-06)
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PATENT APPLICATION FEE DETERMINATION RECORD Substitute for Form PTO-875	Application or Docket Number 11/842,747	Filing Date 08/21/2007	☐ To be Mailed

APPLICATION AS FILED – PART I

FOR	NUMBER FILED (Column 1)	NUMBER EXTRA (Column 2)	SMALL ENTITY ☐ RATE ($)	FEE ($)	OR	OTHER THAN SMALL ENTITY RATE ($)	FEE ($)
☐ BASIC FEE (37 CFR 1.16(a), (b), or (c))	N/A	N/A	N/A			N/A	
☐ SEARCH FEE (37 CFR 1.16(k), (i), or (m))	N/A	N/A	N/A			N/A	
☐ EXAMINATION FEE (37 CFR 1.16(o), (p), or (q))	N/A	N/A	N/A			N/A	
TOTAL CLAIMS (37 CFR 1.16(i))	minus 20 =	*	X $ =		OR	X $ =	
INDEPENDENT CLAIMS (37 CFR 1.16(h))	minus 3 =	*	X $ =			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 $250 ($125 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))							
			TOTAL			TOTAL	

* If the difference in column 1 is less than zero, enter "0" in column 2.

APPLICATION AS AMENDED – PART II

AMENDMENT	02/22/2011	CLAIMS REMAINING AFTER AMENDMENT (Column 1)		HIGHEST NUMBER PREVIOUSLY PAID FOR (Column 2)	PRESENT EXTRA (Column 3)	SMALL ENTITY RATE ($)	ADDITIONAL FEE ($)	OR	OTHER THAN SMALL ENTITY RATE ($)	ADDITIONAL FEE ($)
	Total (37 CFR 1.16(i))	* 68	Minus	** 45	= 23	X $ =		OR	X $52=	1196
	Independent (37 CFR 1.16(h))	* 13	Minus	***4	= 9	X $ =		OR	X $220=	1980
	☐ Application Size Fee (37 CFR 1.16(s))									
	☐ FIRST PRESENTATION OF MULTIPLE DEPENDENT CLAIM (37 CFR 1.16(j))							OR		
						TOTAL ADD'L FEE		OR	TOTAL ADD'L FEE	3176

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

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

Legal Instrument Examiner:
/MARQUITA D. JONES/

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.

AMENDMENTS TO THE CLAIMS

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

1. (Previously presented) A conductor pattern structure of a capacitive touch panel formed on a surface of a substrate, the conductor pattern structure comprising:

a plurality of first-axis conductor assemblies, each first-axis conductor assembly comprising a plurality of first-axis conductor cells arranged on the surface of the substrate along a first axis in a substantially equally-spaced manner, a disposition zone being delimited between adjacent ones of the first-axis conductor assemblies and between adjacent ones of the first-axis conductor cells;

a plurality of first-axis conduction lines respectively connecting between adjacent ones of the first-axis conductor cells of each first-axis conductor assembly so that the first-axis conductor cells of each respective first-axis conductor assembly are electrically connected together;

a plurality of insulation layers, each insulation layer of the plurality of insulation layers covering a surface of each first-axis conduction line without encompassing the adjacent first-axis conductor cells;

a plurality of second-axis conductor assemblies, each second-axis conductor assembly comprising a plurality of second-axis conductor cells arranged on the surface of the substrate along a second axis in a substantially equally-spaced manner, each second-axis conductor cell being set in each disposition zone;

a plurality of second-axis conduction lines respectively connecting between adjacent ones of the second-axis conductor cells of each second-axis conductor assembly so that

the second-axis conductor cells of each respective second-axis conductor assembly are electrically connected together, the second-axis conduction line being extended across a surface of the insulation layer of the respective first-axis conduction line,

wherein first-axis conductor cells and the second-axis conductor cells consist of a transparent conductive material.

2. (Previously presented) The conductor pattern structure as claimed in claim 1, wherein the first-axis conduction lines consist of a transparent conductive material.

3. (Previously presented) The conductor pattern structure as claimed in claim 1, wherein the second-axis conduction lines consist of a transparent conductive material.

4. (Original) The conductor pattern structure as claimed in claim 1, wherein the insulation layer consists of a transparent insulation material.

5. (Original) The conductor pattern structure as claimed in claim 1, wherein the first-axis conductor cells and the second-axis conductor cells have a contour of hexagonal shape.

6. (Previously presented) A conductor pattern structure of a capacitive touch panel formed on a surface of a substrate, the conductor pattern structure comprising:

at least two adjacent first-axis conductor cells; and

at least two adjacent second-axis conductor cells,

wherein the adjacent first-axis conductor cells are connected by a first-axis conduction line provided therebetween,

wherein an insulation layer is formed on a surface of the first-axis conduction line without encompassing the two adjacent first-axis conductor cells, and a second-axis conduction line extends across a surface of the insulation layer to connect between the adjacent second-axis conductor cells, and

wherein first-axis conductor cells and the second-axis conductor cells consist of a transparent conductive material.

7. (Previously presented) The conductor pattern structure as claimed in claim 6, wherein the first-axis conduction lines_consist of a transparent conductive material.

8. (Previously presented) The conductor pattern structure as claimed in claim 6, wherein the second-axis conduction lines consist of a transparent conductive material.

9. (Original) The conductor pattern structure as claimed in claim 6, wherein the insulation layer consists of a transparent insulation material.

10. (Original) The conductor pattern structure as claimed in claim 6, wherein the first-axis conductor cells and the second-axis conductor cells have a contour of hexagonal shape.

11. (Previously presented) The conductor pattern structure as claimed in claim 1 further comprises a plurality of signal transmission lines formed on the surface of the substrate, each signal transmission line respectively connecting each first-axis conductor assembly and each second-axis conductor assembly.

12. (Previously presented) The conductor pattern structure as claimed in claim 11, wherein the first-axis conduction lines consist of a transparent conductive material.

13. (Previously presented) The conductor pattern structure as claimed in claim 11, wherein the second-axis conduction lines consist of a transparent conductive material.

14. (Previously presented) The conductor pattern structure as claimed in claim 11, wherein the insulation layer consists of a transparent insulation material.

15. (Previously presented) The conductor pattern structure as claimed in claim 11, wherein the first-axis conductor cells and the second-axis conductor cells have a contour of hexagonal shape.

16. (Previously presented) The conductor pattern structure as claimed in claim 11, wherein the transparent conductive material is Indium Tin Oxide (ITO).

17. (Currently amended) [The]A conductor pattern structure ~~as claimed in claim 11~~of a capacitive touch panel formed on a surface of a substrate, the conductor pattern structure comprising:

a plurality of first-axis conductor assemblies, each first-axis conductor assembly comprising a plurality of first-axis conductor cells arranged on the surface of the substrate along a first axis in a substantially equally-spaced manner, a disposition zone being delimited between adjacent ones of the first-axis conductor assemblies and between adjacent ones of the first-axis conductor cells;

a plurality of first-axis conduction lines respectively connecting between adjacent ones of the first-axis conductor cells of each first-axis conductor assembly so that the first-axis conductor cells of each respective first-axis conductor assembly are electrically connected together;

a plurality of insulation layers, each insulation layer of the plurality of insulation layers covering a surface of each first-axis conduction line without encompassing the adjacent first-axis conductor cells;

a plurality of second-axis conductor assemblies, each second-axis conductor assembly comprising a plurality of second-axis conductor cells arranged on the surface of the substrate along a second axis in a substantially equally-spaced manner, each second-axis conductor cell being set in each disposition zone;

a plurality of second-axis conduction lines respectively connecting between adjacent ones of the second-axis conductor cells of each second-axis conductor assembly so that the second-axis conductor cells of each respective second-axis conductor assembly are electrically connected together, the second-axis conduction line being extended across a surface of the insulation layer of the respective first-axis conduction line; and

a plurality of signal transmission lines formed on the surface of the substrate, each signal transmission line respectively connecting each first-axis conductor assembly and each second-axis conductor assembly,

wherein first-axis conductor cells and the second-axis conductor cells consist of a transparent conductive material, and

wherein a capacitance between a first cell of the plurality of first-axis conductor cells and a second cell of the plurality of second-axis conductor cells is measured to detect a position of touch.

18. (Previously presented) The conductor pattern structure as claimed in claim 17, wherein the first-axis conduction lines consist of a transparent conductive material.

19. (Previously presented) The conductor pattern structure as claimed in claim 17, wherein the second-axis conduction lines consist of a transparent conductive material.

20. (Previously presented) The conductor pattern structure as claimed in claim 17, wherein the insulation layer consists of a transparent insulation material.

21. (Previously presented) The conductor pattern structure as claimed in claim 17, wherein the first-axis conductor cells and the second-axis conductor cells have a contour of hexagonal shape.

22. (Previously presented) The conductor pattern structure as claimed in claim 17, wherein each second-axis conduction line terminates on the edge of each second-axis conductor cell to the adjacent second-axis conductor cells.

23. (Previously presented) The conductor pattern structure as claimed in claim 17, wherein the transparent conductive material is Indium Tin Oxide (ITO).

24. (Previously presented) The conductor pattern structure as claimed in claim 1, wherein each second-axis conduction line terminates on the edge of each second-axis conductor cell to the adjacent second-axis conductor cells.

25. (Currently amended) [The]A conductor pattern structure ~~as claimed in claim 1~~of a capacitive touch panel formed on a surface of a substrate, the conductor pattern structure comprising:

a plurality of first-axis conductor assemblies, each first-axis conductor assembly comprising a plurality of first-axis conductor cells arranged on the surface of the substrate along a first axis in a substantially equally-spaced manner, a disposition zone being delimited between adjacent ones of the first-axis conductor assemblies and between adjacent ones of the first-axis conductor cells;

a plurality of first-axis conduction lines respectively connecting between adjacent ones of the first-axis conductor cells of each first-axis conductor assembly so that the first-axis conductor cells of each respective first-axis conductor assembly are electrically connected together;

a plurality of insulation layers, each insulation layer of the plurality of insulation layers covering a surface of each first-axis conduction line without encompassing the adjacent first-axis conductor cells;

a plurality of second-axis conductor assemblies, each second-axis conductor assembly comprising a plurality of second-axis conductor cells arranged on the surface of the substrate along a second axis in a substantially equally-spaced manner, each second-axis conductor cell being set in each disposition zone; and

a plurality of second-axis conduction lines respectively connecting between adjacent ones of the second-axis conductor cells of each second-axis conductor assembly so that the second-axis conductor cells of each respective second-axis conductor assembly are electrically connected together, the second-axis conduction line being extended across a surface of the insulation layer of the respective first-axis conduction line,

wherein first-axis conductor cells and the second-axis conductor cells consist of a transparent conductive material, and

wherein a capacitance between a first cell of the plurality of first-axis conductor cells and a second cell of the plurality of second-axis conductor cells is measured to detect a position of touch.

26. (Previously presented) The conductor pattern structure as claimed in claim 25, wherein the first-axis conduction lines consist of a transparent conductive material.

27. (Previously presented) The conductor pattern structure as claimed in claim 25, wherein the second-axis conduction lines consist of a transparent conductive material.

28. (Previously presented) The conductor pattern structure as claimed in claim 25, wherein the insulation layer consists of a transparent insulation material.

29. (Previously presented) The conductor pattern structure as claimed in claim 25, wherein the first-axis conductor cells and the second-axis conductor cells have a contour of hexagonal shape.

30. (Previously presented) The conductor pattern structure as claimed in claim 25, wherein the transparent conductive material is Indium Tin Oxide (ITO).

31. (Previously presented) The conductor pattern structure as claimed in claim 1, wherein the transparent conductive material is Indium Tin Oxide (ITO).

32. (Previously presented) A method of constructing a conductor pattern structure of a capacitive touch panel, the method comprising:

forming a plurality of first-axis conductor cells on a surface of a substrate arranged along a first axis in a substantially equally-spaced manner,

forming a plurality of second-axis conductor cells on the surface of the substrate arranged along a second axis in a substantially equally-spaced manner;

electrically connecting adjacent ones of the first-axis conductor cells along the first-axis using a plurality of first-axis conduction lines to form a plurality of first-axis conductor assemblies, wherein each second-axis conductor cell is set in each disposition zone being delimited between adjacent ones of the first-axis conductor assemblies and between adjacent ones of the first-axis conductor cells;

forming a plurality of insulation layers covering a surface of each first-axis conduction line without encompassing the adjacent first-axis conductor cells; and

electrically connecting adjacent ones of the second-axis conductor cells along the second-axis using a plurality of second-axis conduction lines to form a plurality of second-axis conductor assemblies, each of the first-axis conductor cells and the second-axis conductor cells consisting of a transparent conductive material.

33. (Previously presented) The method of claim 32, wherein the first-axis conductor cells, the second-axis conductor cells and the first-axis conduction lines are formed simultaneously.

34. (Previously presented) The method of claim 32 further comprising forming a plurality of signal transmission lines on the surface of the substrate, each signal transmission line respectively connecting each first-axis conductor assembly and each second-axis conductor assembly.

35. (Currently amended) [The]A method of ~~claim 32 further comprising~~ constructing a conductor pattern structure of a capacitive touch panel, the method comprising:

forming a plurality of first-axis conductor cells on a surface of a substrate arranged along a first axis in a substantially equally-spaced manner,

forming a plurality of second-axis conductor cells on the surface of the substrate arranged along a second axis in a substantially equally-spaced manner;

electrically connecting adjacent ones of the first-axis conductor cells along the first-axis using a plurality of first-axis conduction lines to form a plurality of first-axis conductor assemblies, wherein each second-axis conductor cell is set in each disposition zone being delimited between adjacent ones of the first-axis conductor assemblies and between adjacent ones of the first-axis conductor cells;

forming a plurality of insulation layers covering a surface of each first-axis conduction line without encompassing the adjacent first-axis conductor cells;

electrically connecting adjacent ones of the second-axis conductor cells along the second-axis using a plurality of second-axis conduction lines to form a plurality of second-axis conductor assemblies, each of the first-axis conductor cells and the second-axis conductor cells consisting of a transparent conductive material; and

measuring a capacitance between a first cell of the plurality of first-axis conductor cells and a second cell of the plurality of second-axis conductor cells to detect a position of touch.

36. (Previously presented) The method of claim 32, wherein the first-axis conduction lines consist of a transparent conductive material.

37. (Previously presented) The method of claim 32, wherein the second-axis conduction lines consist of a transparent conductive material.

38. (Previously presented) The method of claim 32, wherein the insulation layer consists of a transparent insulation material.

39. (Previously presented) The method of claim 32, wherein the first-axis conductor cells and the second-axis conductor cells have a contour of hexagonal shape.

40. (Previously presented) The method of claim 32, wherein each second-axis conduction line terminates on the edge of each second-axis conductor cell to the adjacent second-axis conductor cells.

41. (Previously presented) The method of claim 32, wherein the transparent conductive material is Indium Tin Oxide (ITO).

42. (Previously presented) A method of constructing a conductor pattern structure of a capacitive touch panel, the method comprising:

forming a plurality of first-axis conductor cells on a surface of a substrate arranged along a first axis in a substantially equally-spaced manner, wherein each first-axis conductor cell is separated by each disposition zone between adjacent ones of the first-axis conductor cells;

electrically connecting adjacent ones of the first-axis conductor cells along the first-axis using a plurality of first-axis conduction lines to form a plurality of first-axis conductor assemblies;

forming a plurality of insulation layers covering a surface of each first-axis conduction line without encompassing the adjacent first-axis conductor cells;

forming a plurality of second-axis conductor cells in each disposition zone between adjacent ones of the first-axis conductor cells on the surface of the substrate arranged along a second axis in a substantially equally-spaced manner; and

electrically connecting adjacent ones of the second-axis conductor cells along the second-axis using a plurality of second-axis conduction lines to form a plurality of second-axis conductor assemblies, each of the first-axis conductor cells and the second-axis conductor cells consisting of a transparent conductive material.

43. (Previously presented) The method of claim 42 further comprising forming a plurality of signal transmission lines on the surface of the substrate, each signal transmission line respectively connecting each first-axis conductor assembly and each second-axis conductor assembly.

44. (Currently amended) [The]A method of ~~claim 42 further comprising~~ constructing a conductor pattern structure of a capacitive touch panel, the method comprising:

forming a plurality of first-axis conductor cells on a surface of a substrate arranged along a first axis in a substantially equally-spaced manner, wherein each first-axis conductor cell is separated by each disposition zone between adjacent ones of the first-axis conductor cells;

electrically connecting adjacent ones of the first-axis conductor cells along the first-axis using a plurality of first-axis conduction lines to form a plurality of first-axis conductor assemblies;

forming a plurality of insulation layers covering a surface of each first-axis conduction line without encompassing the adjacent first-axis conductor cells;

forming a plurality of second-axis conductor cells in each disposition zone between adjacent ones of the first-axis conductor cells on the surface of the substrate arranged along a second axis in a substantially equally-spaced manner;

electrically connecting adjacent ones of the second-axis conductor cells along the second-axis using a plurality of second-axis conduction lines to form a plurality of second-axis conductor assemblies, each of the first-axis conductor cells and the second-axis conductor cells consisting of a transparent conductive material; and

measuring a capacitance between a first cell of the plurality of first-axis conductor cells and a second cell of the plurality of second-axis conductor cells to detect a position of touch.

45. (Previously presented) The method of claim 42, wherein the transparent conductive material is Indium Tin Oxide (ITO).

46. (New) A conductor pattern structure of a capacitive touch panel formed on a surface of a rigid substrate, the conductor pattern structure comprising:

a plurality of first-axis conductor assemblies, each first-axis conductor assembly comprising a plurality of first-axis conductor cells arranged on the surface of the rigid substrate along a first axis in a substantially equally-spaced manner, a disposition zone being delimited between adjacent ones of the first-axis conductor assemblies and between adjacent ones of the first-axis conductor cells;

a plurality of first-axis conduction lines respectively connecting between adjacent ones of the first-axis conductor cells of each first-axis conductor assembly so that the first-axis conductor cells of each respective first-axis conductor assembly are electrically connected together;

a plurality of insulation layers, each insulation layer of the plurality of insulation layers covering a surface of each first-axis conduction line without encompassing the adjacent first-axis conductor cells;

a plurality of second-axis conductor assemblies, each second-axis conductor assembly comprising a plurality of second-axis conductor cells arranged on the surface of the rigid substrate along a second axis in a substantially equally-spaced manner, each second-axis conductor cell being set in each disposition zone;

a plurality of second-axis conduction lines respectively connecting between adjacent ones of the second-axis conductor cells of each second-axis conductor assembly so that the second-axis conductor cells of each respective second-axis conductor assembly are electrically connected together, the second-axis conduction line being extended across a surface of the insulation layer of the respective first-axis conduction line,

wherein first-axis conductor cells and the second-axis conductor cells consist of a transparent conductive material.

47. (New) The conductor pattern structure as claimed in claim 46, wherein the first-axis conduction lines consist of a transparent conductive material.

48. (New) The conductor pattern structure as claimed in claim 46, wherein the second-axis conduction lines consist of a transparent conductive material.

49. (New) The conductor pattern structure as claimed in claim 46, wherein the insulation layer consists of a transparent insulation material.

50. (New) The conductor pattern structure as claimed in claim 46, wherein the first-axis conductor cells and the second-axis conductor cells have a contour of hexagonal shape.

51. (New) The conductor pattern structure as claimed in claim 46 further comprises a plurality of signal transmission lines formed on the surface of the rigid substrate, each signal transmission line respectively connecting each first-axis conductor assembly and each second-axis conductor assembly.

52. (New) The conductor pattern structure as claimed in claim 46, wherein each second-axis conduction line terminates on the edge of each second-axis conductor cell to the adjacent second-axis conductor cells.

53. (New) A conductor pattern structure of a capacitive touch panel formed on a surface of a rigid substrate, the conductor pattern structure comprising:

at least two adjacent first-axis conductor cells; and

at least two adjacent second-axis conductor cells,

wherein the adjacent first-axis conductor cells are connected by a first-axis conduction line provided therebetween,

wherein an insulation layer is formed on a surface of the first-axis conduction line without encompassing the two adjacent first-axis conductor cells, and a second-axis conduction line extends across a surface of the insulation layer to connect between the adjacent second-axis conductor cells, and

wherein first-axis conductor cells and the second-axis conductor cells consist of a transparent conductive material.

54. (New) The conductor pattern structure as claimed in claim 53, wherein the first-axis conduction lines consist of a transparent conductive material.

55. (New) The conductor pattern structure as claimed in claim 53, wherein the second-axis conduction lines consist of a transparent conductive material.

56. (New) The conductor pattern structure as claimed in claim 53, wherein the insulation layer consists of a transparent insulation material.

57. (New) The conductor pattern structure as claimed in claim 53, wherein the first-axis conductor cells and the second-axis conductor cells have a contour of hexagonal shape.

58. (New) A method of constructing a conductor pattern structure of a capacitive touch panel, the method comprising:

forming a plurality of first-axis conductor cells on a surface of a rigid substrate arranged along a first axis in a substantially equally-spaced manner,

forming a plurality of second-axis conductor cells on the surface of the rigid substrate arranged along a second axis in a substantially equally-spaced manner;

electrically connecting adjacent ones of the first-axis conductor cells along the first-axis using a plurality of first-axis conduction lines to form a plurality of first-axis conductor assemblies, wherein each second-axis conductor cell is set in each disposition zone being delimited between adjacent ones of the first-axis conductor assemblies and between adjacent ones of the first-axis conductor cells;

forming a plurality of insulation layers covering a surface of each first-axis conduction line without encompassing the adjacent first-axis conductor cells; and

electrically connecting adjacent ones of the second-axis conductor cells along the second-axis using a plurality of second-axis conduction lines to form a plurality of second-axis conductor assemblies, each of the first-axis conductor cells and the second-axis conductor cells consisting of a transparent conductive material.

59. (New) The method of claim 58, wherein the first-axis conductor cells, the second-axis conductor cells and the first-axis conduction lines are formed simultaneously.

60. (New) The method of claim 58 further comprising forming a plurality of signal transmission lines on the surface of the rigid substrate, each signal transmission line respectively connecting each first-axis conductor assembly and each second-axis conductor assembly.

61. (New) The method of claim 58, wherein the first-axis conduction lines consist of a transparent conductive material.

62. (New) The method of claim 58, wherein the second-axis conduction lines consist of a transparent conductive material.

63. (New) The method of claim 58, wherein the insulation layer consists of a transparent insulation material.

64. (New) The method of claim 58, wherein the first-axis conductor cells and the second-axis conductor cells have a contour of hexagonal shape.

65. (New) The method of claim 58, wherein each second-axis conduction line terminates on the edge of each second-axis conductor cell to the adjacent second-axis conductor cells.

66. (New) A method of constructing a conductor pattern structure of a capacitive touch panel, the method comprising:

forming a plurality of first-axis conductor cells on a surface of a rigid substrate arranged along a first axis in a substantially equally-spaced manner, wherein each first-axis conductor cell is separated by each disposition zone between adjacent ones of the first-axis conductor cells;

electrically connecting adjacent ones of the first-axis conductor cells along the first-axis using a plurality of first-axis conduction lines to form a plurality of first-axis conductor assemblies;

forming a plurality of insulation layers covering a surface of each first-axis conduction line without encompassing the adjacent first-axis conductor cells;

forming a plurality of second-axis conductor cells in each disposition zone between adjacent ones of the first-axis conductor cells on the surface of the rigid substrate arranged along a second axis in a substantially equally-spaced manner; and

electrically connecting adjacent ones of the second-axis conductor cells along the second-axis using a plurality of second-axis conduction lines to form a plurality of second-axis conductor assemblies, each of the first-axis conductor cells and the second-axis conductor cells consisting of a transparent conductive material.

67. (New) The method of claim 66 further comprising forming a plurality of signal transmission lines on the surface of the rigid substrate, each signal transmission line

respectively connecting each first-axis conductor assembly and each second-axis conductor assembly.

68. (New) A method of constructing a conductor pattern structure of a capacitive touch panel, the method comprising:

forming a plurality of first-axis conductor cells on a surface of a rigid substrate arranged along a first axis in a substantially equally-spaced manner, wherein each first-axis conductor cell is separated by each disposition zone between adjacent ones of the first-axis conductor cells;

electrically connecting adjacent ones of the first-axis conductor cells along the first-axis using a plurality of first-axis conduction lines to form a plurality of first-axis conductor assemblies;

forming a plurality of insulation layers covering a surface of each first-axis conduction line without encompassing the adjacent first-axis conductor cells;

forming a plurality of second-axis conductor cells in each disposition zone between adjacent ones of the first-axis conductor cells on the surface of the rigid substrate arranged along a second axis in a substantially equally-spaced manner;

electrically connecting adjacent ones of the second-axis conductor cells along the second-axis using a plurality of second-axis conduction lines to form a plurality of second-axis conductor assemblies, each of the first-axis conductor cells and the second-axis conductor cells consisting of a transparent conductive material; and

measuring a capacitance between a first cell of the plurality of first-axis conductor cells and a second cell of the plurality of second-axis conductor cells to detect a position of touch.

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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
11/842,747	08/21/2007	Ching-Yang Chang	22271.4002	3897

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EXAMINER	
HICKS, CHARLES V	
ART UNIT	**PAPER NUMBER**
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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.

Advisory Action Before the Filing of an Appeal Brief	Application No. 11/842,747	Applicant(s) CHANG ET AL.	
	Examiner CHARLES HICKS	Art Unit 2629	

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

THE REPLY FILED 22 February 2011 FAILS TO PLACE THIS APPLICATION IN CONDITION FOR ALLOWANCE.

1. ☒ The reply was filed after a final rejection, but prior to or on the same day as filing a Notice of Appeal. To avoid abandonment of this application, applicant must timely file one of the following replies: (1) an amendment, affidavit, or other evidence, which places the application in condition for allowance; (2) a Notice of Appeal (with appeal fee) in compliance with 37 CFR 41.31; or (3) a Request for Continued Examination (RCE) in compliance with 37 CFR 1.114. The reply must be filed within one of the following time periods:
   a) ☐ The period for reply expires ______months from the mailing date of the final rejection.
   b) ☒ The period for reply expires on: (1) the mailing date of this Advisory Action, or (2) the date set forth in the final rejection, whichever is later. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of the final rejection.
   Examiner Note: If box 1 is checked, check either box (a) or (b). ONLY CHECK BOX (b) WHEN THE FIRST REPLY WAS FILED WITHIN TWO MONTHS OF THE FINAL REJECTION. See MPEP 706.07(f).

Extensions of time may be obtained under 37 CFR 1.136(a). The date on which the petition under 37 CFR 1.136(a) and the appropriate extension fee have been filed is the date for purposes of determining the period of extension and the corresponding amount of the fee. The appropriate extension fee under 37 CFR 1.17(a) is calculated from: (1) the expiration date of the shortened statutory period for reply originally set in the final Office action; or (2) as set forth in (b) above, if checked. Any reply received by the Office later than three months after the mailing date of the final rejection, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

NOTICE OF APPEAL

2. ☐ The Notice of Appeal was filed on _____. A brief in compliance with 37 CFR 41.37 must be filed within two months of the date of filing the Notice of Appeal (37 CFR 41.37(a)), or any extension thereof (37 CFR 41.37(e)), to avoid dismissal of the appeal. Since a Notice of Appeal has been filed, any reply must be filed within the time period set forth in 37 CFR 41.37(a).

AMENDMENTS

3. ☒ The proposed amendment(s) filed after a final rejection, but prior to the date of filing a brief, will not be entered because
   (a) ☒ They raise new issues that would require further consideration and/or search (see NOTE below);
   (b) ☐ They raise the issue of new matter (see NOTE below);
   (c) ☒ They are not deemed to place the application in better form for appeal by materially reducing or simplifying the issues for appeal; and/or
   (d) ☐ They present additional claims without canceling a corresponding number of finally rejected claims.
   NOTE: *See Continuation Sheet.* (See 37 CFR 1.116 and 41.33(a)).
4. ☐ The amendments are not in compliance with 37 CFR 1.121. See attached Notice of Non-Compliant Amendment (PTOL-324).
5. ☐ Applicant's reply has overcome the following rejection(s): _____.
6. ☐ Newly proposed or amended claim(s) _____ would be allowable if submitted in a separate, timely filed amendment canceling the non-allowable claim(s).
7. ☒ For purposes of appeal, the proposed amendment(s): a) ☒ will not be entered, or b) ☐ will be entered and an explanation of how the new or amended claims would be rejected is provided below or appended.
   The status of the claim(s) is (or will be) as follows:
   Claim(s) allowed: _____.
   Claim(s) objected to: _____.
   Claim(s) rejected: *1-45*.
   Claim(s) withdrawn from consideration: _____.

AFFIDAVIT OR OTHER EVIDENCE

8. ☐ The affidavit or other evidence filed after a final action, but before or on the date of filing a Notice of Appeal will not be entered because applicant failed to provide a showing of good and sufficient reasons why the affidavit or other evidence is necessary and was not earlier presented. See 37 CFR 1.116(e).
9. ☐ The affidavit or other evidence filed after the date of filing a Notice of Appeal, but prior to the date of filing a brief, will not be entered because the affidavit or other evidence failed to overcome all rejections under appeal and/or appellant fails to provide a showing a good and sufficient reasons why it is necessary and was not earlier presented. See 37 CFR 41.33(d)(1).
10. ☐ The affidavit or other evidence is entered. An explanation of the status of the claims after entry is below or attached.

REQUEST FOR RECONSIDERATION/OTHER

11. ☒ The request for reconsideration has been considered but does NOT place the application in condition for allowance because: See Continuation Sheet.
12. ☐ Note the attached Information *Disclosure Statement*(s). (PTO/SB/08) Paper No(s). _____
13. ☐ Other: _____.

/Alexander S. Beck/
Supervisory Patent Examiner, Art Unit 2629

04/21/2011

Continuation of 3. NOTE: As to claims 46, 53, 58, 66 and 68, the new limitation "formed on a rigid substrate" raises new issues that would require further search and consideration and change the scope of dependent claims because no parent claim of that scope has been previously presented.

Continuation of 11. does NOT place the application in condition for allowance because: applicant argues that the cited prior art of record fails to teach first-axis conductor cells and the second-axis conductor cells consist of a transparent conductive material. Bolender however teaches the conductor cells consisting of a substantially transparent material (Bolender, pg. 2, par. 22) and first and second axis conductor cells being substantially transparent (Bolender, pg. 3, par. 33) while a sustantially opaque material may be disposed where desired (Bolender, pg. 2, par. 23). Applicants further argue that the cited prior art of record fails to teach a plurality of signal transmission lines formed on the surface of the substrate. Bolender however teaches conductive bridges and a conductor pattern as signal lines on the surface of the substrate connecting the first-axis cells and second-axis cells (Bolender, Fig. 3B; pg. 3, par. 35-36). Applicants also argue that the cited prior art of record fails to teach a capacitance between a first cell of the plurality of first-axis cells and a second cell of the plurality of second-axis cells is measured to detect a position of touch. Bolender however teaches a single sheet capacitive sensor including a single substrate that has two or more conductive sensing patterns (Bolender, pg.2, par. 29) that can be used for, but not limited to, 2-dimensional capacitive sensing (Bolender, pg. 2, par. 28). A capacitive signal is detected, therefore measured, to detect a capacitance level or no capacitive level to indicate a touch or no touch. The detected, measured, capacitance of the the first-axis cell and second-axis cell is used to indicate a position of touch between the first-axis and second-axis cells. Further, applicants argue that the cited prior art of record of Bollender as modified by Mulligan would render Bolender unsatisfactory for it's intended purpose. In Mulligan however it is the hexagon shape of the conductor cells (Mulligan, pg. 4, par. 38) that is the limitation brought into Bollender as Bollender teaches that the conductor cells can be of any shape, as in the hexagon shape of Mulligan. Examiner respectfully submits that the claims are absent any language that would preclude such interpretations.

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Appl. No.	:	11/842,747	Confirmation No.: 3897
Applicant	:	Ching-Yang Chang	
Filing Date	:	08/21/2007	
Title	:	CONDUCTOR PATTERN STRUCTURE OF CAPACITIVE TOUCH PANEL	
Group Art Unit	:	2629	
Examiner	:	Hicks, Charles V.	
Docket No.	:	22271-4002	
Customer No.	:	34313	

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

REQUEST FOR CONTINUED EXAMINATION (RCE) TRANSMITTAL

I. Submission required under 37 CFR § 1.114

A. ☒ Previously submitted

1. ☒ Consider the amendment(s)/reply under 37 CFR § 1.116 previously filed on 2/22/2011

2. ☐ Consider the arguments in the Appeal Brief or Reply Brief previously filed on ______

3. ☐ Other ______

B. ☐ Enclosed

1. ☐ Amendment/Reply

2. ☐ Affidavit(s)/Declarations(s)

3. ☐ Information Disclosure Statement (IDS) with copies of non U.S. references

4. ☐ Other –

II. Miscellaneous

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

B. ☐ Other ____________________________

III. Fees

A. ☒ The Commissioner is hereby authorized to charge the following fees, or credit any overpayments, to Deposit Account No. 15-0665

1. ☒ RCE fees (37 CFR §1.17(e):

RCE Fee							$810.00
	Claims filed or remaining after amendment		Highest number previously paid for				
Total Claims	13	-	13	= 0	x	$52.00	$00.00
Independent Claims	55	-	55	= 0	x	$220.00	$00.00
☐ Reduction by ½ for Filing by Small Entity. Note 37 CFR §§ 1.9, 1.27, 1.28.							0.00
TOTAL OF ABOVE CALCULATIONS							$810.00

2. ☐ Extension of time fee (37 CFR §§ 1.136 and 1.17)

EXTENSION (months)	FEE FOR SMALL ENTITY	FEE FOR OTHER THAN SMALL ENTITY
☐ one month	$65.00	$130.00
☐ two months	$245.00	$490.00
☒ three months	$555.00	$1,110.00
☐ four months	$865.00	$1,730.00
☐ five months	$1,175.00	$2,350.00
TOTAL OF ABOVE CALCULATIONS		**$1,110.00**

3. ☐ Other ____________________________

B. ☐ Check in the amount of $______________ is enclosed

C. ☒ The Commissioner is authorized to charge Orrick, Herrington & Sutcliffe LLP's Deposit Account No. **15-0665** in the amount of $1920.00 to cover the filing fee and to credit any overpayments to said Deposit Account **15-0665**

Respectfully submitted,

ORRICK, HERRINGTON & SUTCLIFFE LLP

Dated: June 21, 2011

By: /Robert Isackson/
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Customer Number: 34313

C:\Users\sp0\Desktop\TPK 4002 RCE Transmittal.doc

Electronic Patent Application Fee Transmittal

Application Number:	11842747
Filing Date:	21-Aug-2007
Title of Invention:	CONDUCTOR PATTERN STRUCTURE OF CAPACITIVE TOUCH PANEL
First Named Inventor/Applicant Name:	Ching-Yang Chang
Filer:	Dana M. Zottola/Susan Principe
Attorney Docket Number:	22271.4002

Filed as Large Entity

Utility under 35 USC 111(a) Filing Fees

Description	Fee Code	Quantity	Amount	Sub-Total in USD($)
Basic Filing:				
Pages:				
Claims:				
Miscellaneous-Filing:				
Petition:				
Patent-Appeals-and-Interference:				
Post-Allowance-and-Post-Issuance:				
Extension-of-Time:				
Extension - 3 months with $0 paid	1253	1	1110	1110

Description	Fee Code	Quantity	Amount	Sub-Total in USD($)
Miscellaneous:				
Request for continued examination	1801	1	810	810
	Total in USD ($)			**1920**

Electronic Acknowledgement Receipt

EFS ID:	10355926
Application Number:	11842747
International Application Number:	
Confirmation Number:	3897
Title of Invention:	CONDUCTOR PATTERN STRUCTURE OF CAPACITIVE TOUCH PANEL
First Named Inventor/Applicant Name:	Ching-Yang Chang
Customer Number:	34313
Filer:	Dana M. Zottola/Susan Principe
Filer Authorized By:	Dana M. Zottola
Attorney Docket Number:	22271.4002
Receipt Date:	21-JUN-2011
Filing Date:	21-AUG-2007
Time Stamp:	18:12:31
Application Type:	Utility under 35 USC 111(a)

Payment information:

Submitted with Payment	yes
Payment Type	Deposit Account
Payment was successfully received in RAM	$1920
RAM confirmation Number	5593
Deposit Account	150665
Authorized User	

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 C.F.R. Section 1.19 (Document supply fees)

Charge any Additional Fees required under 37 C.F.R. Section 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	Request for Continued Examination (RCE)	TPK_4002RCE.pdf	486944 de57cbb720cbd141130d622db319c220cd58cab8	no	3
Warnings:					
This is not a USPTO supplied RCE SB30 form.					
Information:					
2	Fee Worksheet (SB06)	fee-info.pdf	32150 68f130edd4f79ee5e806ef647ac7fc7e52bd549b	no	2
Warnings:					
Information:					
		Total Files Size (in bytes):	519094		

This Acknowledgement Receipt evidences receipt on the noted date by the USPTO of the indicated documents, characterized by the applicant, and including page counts, where applicable. It serves as evidence of receipt similar to a Post Card, as described in MPEP 503.

<u>New Applications Under 35 U.S.C. 111</u>
If a new application is being filed and the application includes the necessary components for a filing date (see 37 CFR 1.53(b)-(d) and MPEP 506), a Filing Receipt (37 CFR 1.54) will be issued in due course and the date shown on this Acknowledgement Receipt will establish the filing date of the application.

<u>National Stage of an International Application under 35 U.S.C. 371</u>
If a timely submission to enter the national stage of an international application is compliant with the conditions of 35 U.S.C. 371 and other applicable requirements a Form PCT/DO/EO/903 indicating acceptance of the application as a national stage submission under 35 U.S.C. 371 will be issued in addition to the Filing Receipt, in due course.

<u>New International Application Filed with the USPTO as a Receiving Office</u>
If a new international application is being filed and the international application includes the necessary components for an international filing date (see PCT Article 11 and MPEP 1810), a Notification of the International Application Number and of the International Filing Date (Form PCT/RO/105) will be issued in due course, subject to prescriptions concerning national security, and the date shown on this Acknowledgement Receipt will establish the international filing date of the application.

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Appl. No.	:	11/842,747	Confirmation No.:	3897
Applicants	:	Ching-Yang Chang, *et al.*		
Filing Date	:	August 21, 2007		
Title	:	Conductor Pattern Structure Of Capacitive Touch Panel		
Group Art Unit	:	2629		
Examiner	:	Hicks, Charles V.		
Docket No.	:	22271-4002		
Customer No.	:	34313		

Via: USPTO EFS Web
Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

SUPPLEMENTAL AMENDMENT AND RESPONSE AFTER FINAL

Dear Sir:

This paper is a supplemental response to the Final Office Action mailed on December 21, 2010. This paper resubmits the same arguments as the Amendment and Response After Final to the December 21, 2010 Final Office Action originally submitted on February 22, 2011 with supplemental support from the accompanying declaration of Dr. George E. Gerpheide and including some additional comments.

Listing of the Claims begin on page 2 of this paper.

Remarks/Arguments begin on page 20 of this paper.

LISTING OF THE CLAIMS

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

1. (Previously presented) A conductor pattern structure of a capacitive touch panel formed on a surface of a substrate, the conductor pattern structure comprising:

a plurality of first-axis conductor assemblies, each first-axis conductor assembly comprising a plurality of first-axis conductor cells arranged on the surface of the substrate along a first axis in a substantially equally-spaced manner, a disposition zone being delimited between adjacent ones of the first-axis conductor assemblies and between adjacent ones of the first-axis conductor cells;

a plurality of first-axis conduction lines respectively connecting between adjacent ones of the first-axis conductor cells of each first-axis conductor assembly so that the first-axis conductor cells of each respective first-axis conductor assembly are electrically connected together;

a plurality of insulation layers, each insulation layer of the plurality of insulation layers covering a surface of each first-axis conduction line without encompassing the adjacent first-axis conductor cells;

a plurality of second-axis conductor assemblies, each second-axis conductor assembly comprising a plurality of second-axis conductor cells arranged on the surface of the substrate along a second axis in a substantially equally-spaced manner, each second-axis conductor cell being set in each disposition zone;

a plurality of second-axis conduction lines respectively connecting between adjacent ones of the second-axis conductor cells of each second-axis conductor assembly so that the second-axis conductor cells of each respective second-axis conductor assembly are electrically connected together, the second-axis conduction line being extended across a surface of the insulation layer of the respective first-axis conduction line,

wherein first-axis conductor cells and the second-axis conductor cells consist of a transparent conductive material.

2. (Previously presented) The conductor pattern structure as claimed in claim 1, wherein the first-axis conduction lines consist of a transparent conductive material.

3. (Previously presented) The conductor pattern structure as claimed in claim 1, wherein the second-axis conduction lines consist of a transparent conductive material.

4. (Original) The conductor pattern structure as claimed in claim 1, wherein the insulation layer consists of a transparent insulation material.

5. (Original) The conductor pattern structure as claimed in claim 1, wherein the first-axis conductor cells and the second-axis conductor cells have a contour of hexagonal shape.

6. (Previously presented) A conductor pattern structure of a capacitive touch panel formed on a surface of a substrate, the conductor pattern structure comprising:

at least two adjacent first-axis conductor cells; and

at least two adjacent second-axis conductor cells,

wherein the adjacent first-axis conductor cells are connected by a first-axis conduction line provided therebetween,

wherein an insulation layer is formed on a surface of the first-axis conduction line without encompassing the two adjacent first-axis conductor cells, and a second-axis conduction line extends across a surface of the insulation layer to connect between the adjacent second-axis conductor cells, and

wherein first-axis conductor cells and the second-axis conductor cells consist of a transparent conductive material.

7. (Previously presented) The conductor pattern structure as claimed in claim 6, wherein the first-axis conduction lines_consist of a transparent conductive material.

8. (Previously presented) The conductor pattern structure as claimed in claim 6, wherein the second-axis conduction lines consist of a transparent conductive material.

9. (Original) The conductor pattern structure as claimed in claim 6, wherein the insulation layer consists of a transparent insulation material.

10. (Original) The conductor pattern structure as claimed in claim 6, wherein the first-axis conductor cells and the second-axis conductor cells have a contour of hexagonal shape.

11. (Previously presented) The conductor pattern structure as claimed in claim 1 further comprises a plurality of signal transmission lines formed on the surface of the substrate, each signal transmission line respectively connecting each first-axis conductor assembly and each second-axis conductor assembly.

12. (Previously presented) The conductor pattern structure as claimed in claim 11, wherein the first-axis conduction lines consist of a transparent conductive material.

13. (Previously presented) The conductor pattern structure as claimed in claim 11, wherein the second-axis conduction lines consist of a transparent conductive material.

14. (Previously presented) The conductor pattern structure as claimed in claim 11, wherein the insulation layer consists of a transparent insulation material.

15. (Previously presented) The conductor pattern structure as claimed in claim 11, wherein the first-axis conductor cells and the second-axis conductor cells have a contour of hexagonal shape.

16. (Previously presented) The conductor pattern structure as claimed in claim 11, wherein the transparent conductive material is Indium Tin Oxide (ITO).

17. (Previously presented) A conductor pattern structure of a capacitive touch panel formed on a surface of a substrate, the conductor pattern structure comprising:

a plurality of first-axis conductor assemblies, each first-axis conductor assembly comprising a plurality of first-axis conductor cells arranged on the surface of the substrate along a first axis in a substantially equally-spaced manner, a disposition zone being delimited between adjacent ones of the first-axis conductor assemblies and between adjacent ones of the first-axis conductor cells;

a plurality of first-axis conduction lines respectively connecting between adjacent ones of the first-axis conductor cells of each first-axis conductor assembly so that the first-axis conductor cells of each respective first-axis conductor assembly are electrically connected together;

a plurality of insulation layers, each insulation layer of the plurality of insulation layers covering a surface of each first-axis conduction line without encompassing the adjacent first-axis conductor cells;

a plurality of second-axis conductor assemblies, each second-axis conductor assembly comprising a plurality of second-axis conductor cells arranged on the surface of the substrate along a second axis in a substantially equally-spaced manner, each second-axis conductor cell being set in each disposition zone;

a plurality of second-axis conduction lines respectively connecting between adjacent ones of the second-axis conductor cells of each second-axis conductor assembly so that the second-axis conductor cells of each respective second-axis conductor assembly are electrically connected together, the second-axis conduction line being extended across a surface of the insulation layer of the respective first-axis conduction line; and

a plurality of signal transmission lines formed on the surface of the substrate, each signal transmission line respectively connecting each first-axis conductor assembly and each second-axis conductor assembly,

wherein first-axis conductor cells and the second-axis conductor cells consist of a transparent conductive material, and

wherein a capacitance between a first cell of the plurality of first-axis conductor cells and a second cell of the plurality of second-axis conductor cells is measured to detect a position of touch.

18. (Previously presented) The conductor pattern structure as claimed in claim 17, wherein the first-axis conduction lines consist of a transparent conductive material.

19. (Previously presented) The conductor pattern structure as claimed in claim 17, wherein the second-axis conduction lines consist of a transparent conductive material.

20. (Previously presented) The conductor pattern structure as claimed in claim 17, wherein the insulation layer consists of a transparent insulation material.

21. (Previously presented) The conductor pattern structure as claimed in claim 17, wherein the first-axis conductor cells and the second-axis conductor cells have a contour of hexagonal shape.

22. (Previously presented) The conductor pattern structure as claimed in claim 17, wherein each second-axis conduction line terminates on the edge of each second-axis conductor cell to the adjacent second-axis conductor cells.

23. (Previously presented) The conductor pattern structure as claimed in claim 17, wherein the transparent conductive material is Indium Tin Oxide (ITO).

24. (Previously presented) The conductor pattern structure as claimed in claim 1, wherein each second-axis conduction line terminates on the edge of each second-axis conductor cell to the adjacent second-axis conductor cells.

25. (Previously presented) A conductor pattern structure of a capacitive touch panel formed on a surface of a substrate, the conductor pattern structure comprising:

a plurality of first-axis conductor assemblies, each first-axis conductor assembly comprising a plurality of first-axis conductor cells arranged on the surface of the substrate along a first axis in a substantially equally-spaced manner, a disposition zone being delimited between adjacent ones of the first-axis conductor assemblies and between adjacent ones of the first-axis conductor cells;

a plurality of first-axis conduction lines respectively connecting between adjacent ones of the first-axis conductor cells of each first-axis conductor assembly so that the first-axis conductor cells of each respective first-axis conductor assembly are electrically connected together;

a plurality of insulation layers, each insulation layer of the plurality of insulation layers covering a surface of each first-axis conduction line without encompassing the adjacent first-axis conductor cells;

a plurality of second-axis conductor assemblies, each second-axis conductor assembly comprising a plurality of second-axis conductor cells arranged on the surface of the substrate along a second axis in a substantially equally-spaced manner, each second-axis conductor cell being set in each disposition zone; and

a plurality of second-axis conduction lines respectively connecting between adjacent ones of the second-axis conductor cells of each second-axis conductor assembly so that the second-axis conductor cells of each respective second-axis conductor assembly are electrically connected together, the second-axis conduction line being extended across a surface of the insulation layer of the respective first-axis conduction line,

wherein first-axis conductor cells and the second-axis conductor cells consist of a transparent conductive material, and

wherein a capacitance between a first cell of the plurality of first-axis conductor cells and a second cell of the plurality of second-axis conductor cells is measured to detect a position of touch.

26. (Previously presented) The conductor pattern structure as claimed in claim 25, wherein the first-axis conduction lines consist of a transparent conductive material.

27. (Previously presented) The conductor pattern structure as claimed in claim 25, wherein the second-axis conduction lines consist of a transparent conductive material.

28. (Previously presented) The conductor pattern structure as claimed in claim 25, wherein the insulation layer consists of a transparent insulation material.

29. (Previously presented) The conductor pattern structure as claimed in claim 25, wherein the first-axis conductor cells and the second-axis conductor cells have a contour of hexagonal shape.

30. (Previously presented) The conductor pattern structure as claimed in claim 25, wherein the transparent conductive material is Indium Tin Oxide (ITO).

31. (Previously presented) The conductor pattern structure as claimed in claim 1, wherein the transparent conductive material is Indium Tin Oxide (ITO).

32. (Previously presented) A method of constructing a conductor pattern structure of a capacitive touch panel, the method comprising:

forming a plurality of first-axis conductor cells on a surface of a substrate arranged along a first axis in a substantially equally-spaced manner,

forming a plurality of second-axis conductor cells on the surface of the substrate arranged along a second axis in a substantially equally-spaced manner;

electrically connecting adjacent ones of the first-axis conductor cells along the first-axis using a plurality of first-axis conduction lines to form a plurality of first-axis conductor assemblies, wherein each second-axis conductor cell is set in each disposition zone being delimited between adjacent ones of the first-axis conductor assemblies and between adjacent ones of the first-axis conductor cells;

forming a plurality of insulation layers covering a surface of each first-axis conduction line without encompassing the adjacent first-axis conductor cells; and

electrically connecting adjacent ones of the second-axis conductor cells along the second-axis using a plurality of second-axis conduction lines to form a plurality of second-axis conductor assemblies, each of the first-axis conductor cells and the second-axis conductor cells consisting of a transparent conductive material.

33. (Previously presented) The method of claim 32, wherein the first-axis conductor cells, the second-axis conductor cells and the first-axis conduction lines are formed simultaneously.

34. (Previously presented) The method of claim 32 further comprising forming a plurality of signal transmission lines on the surface of the substrate, each signal transmission line

respectively connecting each first-axis conductor assembly and each second-axis conductor assembly.

35. (Previously presented) A method of constructing a conductor pattern structure of a capacitive touch panel, the method comprising:

forming a plurality of first-axis conductor cells on a surface of a substrate arranged along a first axis in a substantially equally-spaced manner,

forming a plurality of second-axis conductor cells on the surface of the substrate arranged along a second axis in a substantially equally-spaced manner;

electrically connecting adjacent ones of the first-axis conductor cells along the first-axis using a plurality of first-axis conduction lines to form a plurality of first-axis conductor assemblies, wherein each second-axis conductor cell is set in each disposition zone being delimited between adjacent ones of the first-axis conductor assemblies and between adjacent ones of the first-axis conductor cells;

forming a plurality of insulation layers covering a surface of each first-axis conduction line without encompassing the adjacent first-axis conductor cells;

electrically connecting adjacent ones of the second-axis conductor cells along the second-axis using a plurality of second-axis conduction lines to form a plurality of second-axis conductor assemblies, each of the first-axis conductor cells and the second-axis conductor cells consisting of a transparent conductive material; and

measuring a capacitance between a first cell of the plurality of first-axis conductor cells and a second cell of the plurality of second-axis conductor cells to detect a position of touch.

36. (Previously presented) The method of claim 32, wherein the first-axis conduction lines consist of a transparent conductive material.

37. (Previously presented) The method of claim 32, wherein the second-axis conduction lines consist of a transparent conductive material.

38. (Previously presented) The method of claim 32, wherein the insulation layer consists of a transparent insulation material.

39. (Previously presented) The method of claim 32, wherein the first-axis conductor cells and the second-axis conductor cells have a contour of hexagonal shape.

40. (Previously presented) The method of claim 32, wherein each second-axis conduction line terminates on the edge of each second-axis conductor cell to the adjacent second-axis conductor cells.

41. (Previously presented) The method of claim 32, wherein the transparent conductive material is Indium Tin Oxide (ITO).

42. (Previously presented) A method of constructing a conductor pattern structure of a capacitive touch panel, the method comprising:

forming a plurality of first-axis conductor cells on a surface of a substrate arranged along a first axis in a substantially equally-spaced manner, wherein each first-axis conductor cell is separated by each disposition zone between adjacent ones of the first-axis conductor cells;

electrically connecting adjacent ones of the first-axis conductor cells along the first-axis using a plurality of first-axis conduction lines to form a plurality of first-axis conductor assemblies;

forming a plurality of insulation layers covering a surface of each first-axis conduction line without encompassing the adjacent first-axis conductor cells;

forming a plurality of second-axis conductor cells in each disposition zone between adjacent ones of the first-axis conductor cells on the surface of the substrate arranged along a second axis in a substantially equally-spaced manner; and

electrically connecting adjacent ones of the second-axis conductor cells along the second-axis using a plurality of second-axis conduction lines to form a plurality of second-axis conductor assemblies, each of the first-axis conductor cells and the second-axis conductor cells consisting of a transparent conductive material.

43. (Previously presented) The method of claim 42 further comprising forming a plurality of signal transmission lines on the surface of the substrate, each signal transmission line respectively connecting each first-axis conductor assembly and each second-axis conductor assembly.

44. (Previously presented) A method of constructing a conductor pattern structure of a capacitive touch panel, the method comprising:

forming a plurality of first-axis conductor cells on a surface of a substrate arranged along a first axis in a substantially equally-spaced manner, wherein each first-axis conductor cell is separated by each disposition zone between adjacent ones of the first-axis conductor cells;

electrically connecting adjacent ones of the first-axis conductor cells along the first-axis using a plurality of first-axis conduction lines to form a plurality of first-axis conductor assemblies;

forming a plurality of insulation layers covering a surface of each first-axis conduction line without encompassing the adjacent first-axis conductor cells;

forming a plurality of second-axis conductor cells in each disposition zone between adjacent ones of the first-axis conductor cells on the surface of the substrate arranged along a second axis in a substantially equally-spaced manner;

electrically connecting adjacent ones of the second-axis conductor cells along the second-axis using a plurality of second-axis conduction lines to form a plurality of second-axis conductor assemblies, each of the first-axis conductor cells and the second-axis conductor cells consisting of a transparent conductive material; and

measuring a capacitance between a first cell of the plurality of first-axis conductor cells and a second cell of the plurality of second-axis conductor cells to detect a position of touch.

45. (Previously presented) The method of claim 42, wherein the transparent conductive material is Indium Tin Oxide (ITO).

46. (Previously presented) A conductor pattern structure of a capacitive touch panel formed on a surface of a rigid substrate, the conductor pattern structure comprising:

a plurality of first-axis conductor assemblies, each first-axis conductor assembly comprising a plurality of first-axis conductor cells arranged on the surface of the rigid substrate along a first axis in a substantially equally-spaced manner, a disposition zone being delimited between adjacent ones of the first-axis conductor assemblies and between adjacent ones of the first-axis conductor cells;

a plurality of first-axis conduction lines respectively connecting between adjacent ones of the first-axis conductor cells of each first-axis conductor assembly so that the first-axis conductor cells of each respective first-axis conductor assembly are electrically connected together;

a plurality of insulation layers, each insulation layer of the plurality of insulation layers covering a surface of each first-axis conduction line without encompassing the adjacent first-axis conductor cells;

a plurality of second-axis conductor assemblies, each second-axis conductor assembly comprising a plurality of second-axis conductor cells arranged on the surface of the rigid substrate along a second axis in a substantially equally-spaced manner, each second-axis conductor cell being set in each disposition zone;

a plurality of second-axis conduction lines respectively connecting between adjacent ones of the second-axis conductor cells of each second-axis conductor assembly so that the second-axis conductor cells of each respective second-axis conductor assembly are electrically connected together, the second-axis conduction line being extended across a surface of the insulation layer of the respective first-axis conduction line,

wherein first-axis conductor cells and the second-axis conductor cells consist of a transparent conductive material.

47. (Previously presented) The conductor pattern structure as claimed in claim 46, wherein the first-axis conduction lines consist of a transparent conductive material.

48. (Previously presented) The conductor pattern structure as claimed in claim 46, wherein the second-axis conduction lines consist of a transparent conductive material.

49. (Previously presented) The conductor pattern structure as claimed in claim 46, wherein the insulation layer consists of a transparent insulation material.

50. (Previously presented) The conductor pattern structure as claimed in claim 46, wherein the first-axis conductor cells and the second-axis conductor cells have a contour of hexagonal shape.

51. (Previously presented) The conductor pattern structure as claimed in claim 46 further comprises a plurality of signal transmission lines formed on the surface of the rigid substrate, each signal transmission line respectively connecting each first-axis conductor assembly and each second-axis conductor assembly.

52. (Previously presented) The conductor pattern structure as claimed in claim 46, wherein each second-axis conduction line terminates on the edge of each second-axis conductor cell to the adjacent second-axis conductor cells.

53. (Previously presented) A conductor pattern structure of a capacitive touch panel formed on a surface of a rigid substrate, the conductor pattern structure comprising:

at least two adjacent first-axis conductor cells; and

at least two adjacent second-axis conductor cells,

wherein the adjacent first-axis conductor cells are connected by a first-axis conduction line provided therebetween,

wherein an insulation layer is formed on a surface of the first-axis conduction line without encompassing the two adjacent first-axis conductor cells, and a second-axis conduction line extends across a surface of the insulation layer to connect between the adjacent second-axis conductor cells, and

wherein first-axis conductor cells and the second-axis conductor cells consist of a transparent conductive material.

54. (Previously presented) The conductor pattern structure as claimed in claim 53, wherein the first-axis conduction lines consist of a transparent conductive material.

55. (Previously presented) The conductor pattern structure as claimed in claim 53, wherein the second-axis conduction lines consist of a transparent conductive material.

56. (Previously presented) The conductor pattern structure as claimed in claim 53, wherein the insulation layer consists of a transparent insulation material.

57. (Previously presented) The conductor pattern structure as claimed in claim 53, wherein the first-axis conductor cells and the second-axis conductor cells have a contour of hexagonal shape.

58. (Previously presented) A method of constructing a conductor pattern structure of a capacitive touch panel, the method comprising:

forming a plurality of first-axis conductor cells on a surface of a rigid substrate arranged along a first axis in a substantially equally-spaced manner,

forming a plurality of second-axis conductor cells on the surface of the rigid substrate arranged along a second axis in a substantially equally-spaced manner;

electrically connecting adjacent ones of the first-axis conductor cells along the first-axis using a plurality of first-axis conduction lines to form a plurality of first-axis conductor assemblies, wherein each second-axis conductor cell is set in each disposition zone being delimited between adjacent ones of the first-axis conductor assemblies and between adjacent ones of the first-axis conductor cells;

forming a plurality of insulation layers covering a surface of each first-axis conduction line without encompassing the adjacent first-axis conductor cells; and

electrically connecting adjacent ones of the second-axis conductor cells along the second-axis using a plurality of second-axis conduction lines to form a plurality of second-axis conductor assemblies, each of the first-axis conductor cells and the second-axis conductor cells consisting of a transparent conductive material.

59. (Previously presented) The method of claim 58, wherein the first-axis conductor cells, the second-axis conductor cells and the first-axis conduction lines are formed simultaneously.

60. (Previously presented) The method of claim 58 further comprising forming a plurality of signal transmission lines on the surface of the rigid substrate, each signal transmission line respectively connecting each first-axis conductor assembly and each second-axis conductor assembly.

61. (Previously presented) The method of claim 58, wherein the first-axis conduction lines consist of a transparent conductive material.

62. (Previously presented) The method of claim 58, wherein the second-axis conduction lines consist of a transparent conductive material.

63. (Previously presented) The method of claim 58, wherein the insulation layer consists of a transparent insulation material.

64. (Previously presented) The method of claim 58, wherein the first-axis conductor cells and the second-axis conductor cells have a contour of hexagonal shape.

65. (Previously presented) The method of claim 58, wherein each second-axis conduction line terminates on the edge of each second-axis conductor cell to the adjacent second-axis conductor cells.

66. (Previously presented) A method of constructing a conductor pattern structure of a capacitive touch panel, the method comprising:

forming a plurality of first-axis conductor cells on a surface of a rigid substrate arranged along a first axis in a substantially equally-spaced manner, wherein each first-axis conductor cell is separated by each disposition zone between adjacent ones of the first-axis conductor cells;

electrically connecting adjacent ones of the first-axis conductor cells along the first-axis using a plurality of first-axis conduction lines to form a plurality of first-axis conductor assemblies;

forming a plurality of insulation layers covering a surface of each first-axis conduction line without encompassing the adjacent first-axis conductor cells;

forming a plurality of second-axis conductor cells in each disposition zone between adjacent ones of the first-axis conductor cells on the surface of the rigid substrate arranged along a second axis in a substantially equally-spaced manner; and

electrically connecting adjacent ones of the second-axis conductor cells along the second-axis using a plurality of second-axis conduction lines to form a plurality of second-axis conductor assemblies, each of the first-axis conductor cells and the second-axis conductor cells consisting of a transparent conductive material.

67. (Previously presented) The method of claim 66 further comprising forming a plurality of signal transmission lines on the surface of the rigid substrate, each signal transmission line respectively connecting each first-axis conductor assembly and each second-axis conductor assembly.

68. (Previously presented) A method of constructing a conductor pattern structure of a capacitive touch panel, the method comprising:

forming a plurality of first-axis conductor cells on a surface of a rigid substrate arranged along a first axis in a substantially equally-spaced manner, wherein each first-axis conductor cell is separated by each disposition zone between adjacent ones of the first-axis conductor cells;

electrically connecting adjacent ones of the first-axis conductor cells along the first-axis using a plurality of first-axis conduction lines to form a plurality of first-axis conductor assemblies;

forming a plurality of insulation layers covering a surface of each first-axis conduction line without encompassing the adjacent first-axis conductor cells;

forming a plurality of second-axis conductor cells in each disposition zone between adjacent ones of the first-axis conductor cells on the surface of the rigid substrate arranged along a second axis in a substantially equally-spaced manner;

electrically connecting adjacent ones of the second-axis conductor cells along the second-axis using a plurality of second-axis conduction lines to form a plurality of second-axis conductor assemblies, each of the first-axis conductor cells and the second-axis conductor cells consisting of a transparent conductive material; and

measuring a capacitance between a first cell of the plurality of first-axis conductor cells and a second cell of the plurality of second-axis conductor cells to detect a position of touch.

REMARKS

Claims 1-68 are pending.

In the Final Office Action dated December 21, 2010, claims 1-4, 6-9, 11-14, 16-20, 22-28, 30-38, and 40-45 were rejected under 35 U.S.C. §102(b) as being anticipated by U.S. Patent Pub. No. 2005/0030048 by Bolender, *et al.* ("Bolender").

Claims 5, 10, 15, 21, 29, and 39 were rejected under 35 U.S.C. §103(a) as being unpatentable over Bolender in view of U.S. Patent Pub. No. 2004/0119701 by Mulligan, *et al.* ("Mulligan").

Claims 17, 25, 35, and 44 were rewritten in independent form including all of the limitation of their respective base claims. These amendments are believed to place the claims in condition for allowance and in any event in better condition for consideration on appeal.

Claims 46-68 were previously added.

Applicant respectfully requests reconsideration of the application in view of the following.

CLAIM REJECTIONS

I. Rejections Under 35 U.S.C. § 102(b)

The Examiner rejected claims 1-4, 6-9, 11-14, 16-20, 22-28, 30-38, and 40-45 under 35 U.S.C. §102(b) as being anticipated by Bolender. 12/21/10 Final Office Action, p. 2. Applicant respectfully traverses the Examiner's rejection of claims 1-4, 6-9, 11-14, 16-20, 22-28, 30-38, and 40-45 for at least the following reasons.

Bolender discloses a capacitive sensing device including a single sheet capacitive sensor configured to be disposed within a keypad assembly. Bolender, Abstract.

Bolender teaches a structure of the capacitive sensor that uses a combination of a transparent or substantially transparent conductive material ***and*** an **opaque or substantially opaque material**. Emphasis added. Declaration of Dr. George E. Gerpheide ("Gerpheide Decl.") (July 11, 2011), ¶¶9-10. For example, with reference to Figure 2, Bolender describes the structure as follows:

> a single layer of substantially transparent conductive material, e.g., indium tin oxide (ITO), and an extra layer of ***substantially opaque conductive material*** (e.g., silver ink, carbon ink, a mixture of silver and carbon inks, etc.) that protects the substantially transparent conductive material against cracking during manufacture and/or repetitive use. Since the ***substantially opaque conductive material*** application is also a redundant electrical path, it can be selectively disposed where desired.

Bolender, ¶ [0026], emphasis added. Further, with respect to Figure 4, Bolender makes clear that every capacitive "cell" includes at least some opaque material overlying it, thereby providing the ability to illuminate the keys underneath and provide the capacitive sensing:

> FIG. 4 is a diagram of an exemplary capacitive sensing device 400 that illustrates selective disposing of ***substantially opaque conductive material*** in accordance with an embodiment of the present invention. It is noted that capacitive sensing device 400 can be fabricated in a manner similar to capacitive sensor patterns 300A and 300B of FIGS. 3A and 3B, respectively, as described herein. The ***solid lines of capacitive sensing device 400 represent the substantially opaque conductive material*** while the dashed lines represent the underlying substantially transparent conductive material within an "illumination" opening 402 of capacitive sensing device 400. In this manner, light is able to pass through opening 402 of capacitive sensing device 400 in order to illuminate one or more keys (e.g., 204) of a keypad (e.g., 206) associated with an electronic device (e.g., 100) while still providing capacitive sensing capabilities within opening 402 via the existing substantially transparent conductive material. It is understood that the underlying substantially transparent conductive material extends beneath ***the substantially opaque conductive material***.

Bolender, ¶ [0042], emphasis added. Gerpheide Decl. ¶9. Indeed, a careful reading of the Bolender specification and drawings reveals that every capacitive sensing device has some **opaque or substantially opaque conductive material**. *See, e.g.*, Bolender ¶¶ [0030], [0031], [0034], [0037]-[0055], [0060], [0061], and [0066]-[0068]. Gerpheide Decl. ¶9. Furthermore, it is known in the art that ITO is inherently brittle, requiring some additional support structure to prevent damage, as well as not being fully transparent.

> … the fact that ITO is generally difficult and expensive to apply as a thin film of sufficient quality. Once applied, it is brittle, and therefore can easily wear out or crack when used in applications where bending is involved.

Indium Tin Oxide and Alternative Transparent Conductor Markets, NanoMarkets LC, www.nanomarkets.net, web, April 2009, p. 1. Gerpheide Decl. ¶11, Exhibit A. This NanoMarkets reference provides further support that the disclosure in Bolender fails to demonstrate a transparent conductive layer. Gerpheide Decl. ¶11, Exhibit A.

From the foregoing, a person of ordinary skill in the art would recognize that Bolender's capacitive "cells" are made to be at least in part **opaque or substantially opaque**. This is further evidenced by Bolender's requirement for an "opening" 402 through which light passes to illuminate the keys 204. *See* Bolender, Figures 2, 4, and 9; ¶¶ [0042]-[0043], [0060]-[0061]. Gerpheide Decl. ¶9. In order to form the light-passing opening 402**, substantially opaque conductive material** is "selectively" disposed and the capacitive "cells" are specially shaped to form partial diamonds 308a, 320a, 314a and 326a. *Id*. Gerpheide Decl. ¶9. Stated otherwise, if Bolender's capacitive "cells" were made of only transparent material, no such opening 402 would be necessary because light passes through the entirely transparent capacitive "cells". *See* Bolender, ¶ [0026]. Gerpheide Decl. ¶9.

It is well known that a prior art reference must be considered in its entirety, *i.e.*, as a whole, including portions that would lead away from the claimed invention. *W.L. Gore & Associates, Inc. v. Garlock, Inc.*, 721 F.2d 1540, 220 USPQ 303 (Fed. Cir. 1983), *cert. denied*, 469 U.S. 851 (1984). MPEP § 2141.02 (VI).

In contrast, claim 1 requires that the "**first-axis conductor cells and the second-axis conductor cells consist of a transparent conductive material**." Emphasis added. Gerpheide Decl. ¶9. The same or a similar limitation is found in each independent claim 6, 17, 25, 32, 35, 42, and 44. Bolender does not, however, disclose such a conductor cell structure. Gerpheide Decl. ¶¶9-10. Rather, as noted above, the structure in Bolender corresponding to a conductor cell is made of a multi layer conductive structure having [1] a transparent or substantially transparent layer that extends underneath and **[2]** an **opaque or a substantially opaque layer**, the latter being printed over at least part of the transparent or substantially transparent layer. Nowhere does Bolender disclose conductor cells that "**consist of a transparent conductive material**," as called for in each of Applicant's independent claims. Gerpheide Decl. ¶¶9-10. Instead, each of Bolender's capacitive "cells" contains an **opaque or substantially opaque layer** as part of the conductor structure to "selectively" illuminate the keys for enabling conventional use of the keys. *See* Bolender, ¶¶ [0021], [0023]. Bolender explains that the opaque coating is useful to protect the underlying transparent conductive material. *See* Bolender, ¶¶ [0023], [0038]. Indeed, this difference can be attributed to the fact that Bolender addresses a different technical problem, that of a keypad assembly, for example, of a mobile phone, including a conventional switch sensor 214 for detecting user's depression of keys (thus "selective" or "partial" transparency/opacity is required) and an integrated capacitive sensor 208 for detecting user's finger motion over keypad region 106 (*See* Bolender, Abstract, Figures 1 and

2; ¶¶ [0001], [0021]). Gerpheide Decl. ¶9. Applicant's invention on the other hand addresses "**a capacitive touch panel**" having capacitive cells consisting of a transparent conductive material (*See* Claim 1). Accordingly, Bolender does not disclose every limitation of claim 1, and similarly the other independent claims, and the claims depending therefrom.

For these reasons, Applicant respectfully submits that claim 1 and claims 2-4, 11-14, 16-20, 22-28, 30, and 31 that depend from claim 1 are NOT anticipated under 35 U.S.C. §102(b) by Bolender and requests withdrawal of the rejections.

Regarding claim 11, the Examiner stated that Bolender discloses that the conductor pattern structure comprises "**a plurality of signal transmission lines <u>formed on the surface of the substrate</u>**." 12/21/10 Final Office Action, p. 6, emphasis added. Applicant respectfully traverses this rejection for the following reasons.

A careful reading of the Examiner's cited paragraphs [0036] and [0035] and Figures 3A and 3B (*See Id*) reveals that Bolender does NOT disclose a plurality of signal transmission lines, particularly any signal transmission line of the plurality of signal transmission lines is "**formed on the surface of the substrate**" and "**respectively connecting each first-axis conductor assembly and each second-axis conductor assembly**," as claim 11 recites. Instead, Bolender merely shows the capacitive sensor traces are connected to each other to form *separate* capacitive sensor patterns. *See* Bolender, Figures 3A and 3B. Gerpheide Decl. ¶13.

In fact, there are many different designs and structures available for connecting capacitive sensor traces and patterns in a touch pad design depending on the system requirements and specific applications that the designs and structures are intended for. For example, Seely (U.S. Patent No. 6,188,391) that the Examiner relied upon in the previous Office Action dated June 25, 2010, discloses that the transmission lines are NOT formed on the same substrate as the sensor electrodes. Given that many different designs and structures are available for connecting capacitive sensor traces and patterns, Applicant respectfully submits that a person having ordinary skill in the art after reading Bolender would fail to recognize that Bolender discloses "**a plurality of signal transmission lines formed on the surface of the substrate**" and "**each signal transmission line respectively connect[s] each first-axis conductor assembly and each second-axis conductor assembly**." Gerpheide Decl. ¶13.

At least for these independent reasons, Applicant respectfully submits that claim 11 and claims 12-16 that depend from claim 11 are NOT anticipated under 35 U.S.C. 102(b) by Bolender and requests withdrawal of the rejections of claims 11-16.

Claims 17, 34, and 43 also recite "**a plurality of signal transmission lines formed on the surface of the substrate**" and "**each signal transmission line respectively connecting each first-axis conductor assembly and each second-axis conductor assembly**."

For the reasons set forth regarding claim 11, Applicant respectfully submits that claims 17 and claims 18-23 that depend from claim 17, and claims 34 and 43 are NOT anticipated under 35 U.S.C. 102(b) by Bolender and requests withdrawal of the rejections of claims 17-23, 34, and 43.

Further regarding claim 17 that depends from claim 1 (and as amended is rewritten in independent form), the Examiner stated that Bolender in paragraph [0029] discloses the claimed feature that "**a capacitance <u>between a first cell of the plurality of first-axis cells and a second cell of the plurality of second-axis cells</u> is measured to detect a position of touch**." 12/21/10 Final Office Action, p. 7, emphasis added. Applicant respectfully disagrees for the following reasons.

The paragraph [0029] of Bolender cited by the Examiner describes:

> FIG. 3A is a diagram of <u>an intermediate step in constructing an exemplary capacitive sensor</u> 300A that includes a first capacitive sensor pattern 302 and a second capacitive sensor pattern 304 in accordance with an embodiment of the present invention for a capacitive sensing device. For example, <u>capacitive sensor pattern 302 includes electrically coupled horizontal capacitive sensor traces while capacitive sensor pattern 304 includes the as yet electrically uncoupled vertical sensor traces</u>.

Bolender, ¶ [0029], emphasis added.

Contrary to the Examiner's assertion, however, nowhere in paragraph [0029] does Bolender disclose how a capacitance is sensed by any sensing circuitry or how the user's finger motion is recognized by the character recognition circuitry (*See* Bolender, ¶¶ [0021], [0024], [0032]) (*See* Gerpheide Decl. ¶¶9, 13); nor is there a detailed explanation of whether or not "**a capacitance <u>between a first cell of the plurality of first-axis cells and a second cell of the plurality of second-axis cells</u> is measured**." Claim 17, emphasis added. Gerpheide Decl. ¶¶9, 13. Instead, Bolender in paragraph [0029] merely describes the construction steps of its sensor patterns including capacitive sensor pattern 302 including electrically coupled horizontal capacitive sensor traces and capacitive sensor pattern 304 including electrically uncoupled vertical capacitive sensor traces. In addition, Bolender fails to explicitly disclose how the capacitive sensing circuitry is coupled to the capacitive sensor traces (i.e., cells) of the capacitive sensor patterns 302 and 304 and how the user's finger motion is detected. Even after the electrically isolated vertical capacitive sensor traces are coupled to each other using conductive bridges, for example, items 352 and 354 (*See* Bolender, Figure 3B; ¶ [0035]), the vertical and horizontal capacitive sensor patterns 302 and 304 would be ***still electrically isolated*** from each other.

Therefore, Applicant respectfully submits that the Examiner's reliance on and interpretation of Bolender's paragraph [0029] for rejecting claim 17 is misplaced or at least irrelevant to the feature of "**a capacitance <u>between a first cell of the plurality of first-axis conductor cells and a second cell of the plurality of second-axis conductor cells</u> is measured to detect a position of touch**," as required by claim 17.

Furthermore, it bears mention that Bolender recognized the technical difficulties of a conventional keypad assembly design that requires key post holes through a capacitance sensor underneath the keypad. In addition, Bolender recognized the requirement for a lot of compensation in the sensing circuitry of the capacitive sensor due to the irregular sensor design due to the key post through holes (*See* Bolender, Abstract; ¶ [0002]). In order to overcome these technical difficulties and requirement for compensation, Bolender proposed a new keypad assembly design with an integrated capacitive sensor formed onto a **flexible and deformable** substrate with odd shaped sensing areas (*e.g.*, 308a, 320a, 314a, 326a) for back lighting illumination and conductive bridges disposed in a specific orientation and location such that the **substantially opaque conductive material** used in the structure is tailored to <u>minimize the capacitive interferences</u>. *See* Bolender, Figures 4 and 9; ¶¶ [0026], [0043], [0061], emphasis added. If the capacitive interference between capacitive sensor patterns and the conductive bridges need to be minimized, then a person of ordinary skill in the art would recognize that the capacitive interference between the horizontal capacitive sensor patterns and the vertical capacitive sensor patterns needs to be minimized as well, if not completely eliminated.

Applicant respectfully submits that these teachings of Bolender are fundamentally different from the claimed feature in claim 17 that recites "**<u>a plurality of first-axis conductor cells arranged on the surface of the substrate</u>**," "**<u>a plurality of second-axis conductor cells arranged on the surface of the substrate</u>**," and that "**a capacitance <u>between a first cell of the plurality of first-axis cells and a second cell of the plurality of second-axis cells</u> is**

measured." In fact, Applicant respectfully submits that the listed inventors of the present application are the first to have recognized the advantages of, succeeded in achieving, and claimed, to arrange "**a plurality of first-axis conductor cells**" and "**a plurality of second-axis conductor cells [] on the surface of the [same] substrate**," and to measure "**a capacitance between a first cell of the plurality of first-axis cells and a second cell of the plurality of second-axis cells**," notwithstanding the existence of the technical difficulties and interference issues as Bolender contemplates.

Claims 25, 35, and 44 also recite "**a plurality of first-axis conductor cells arranged on the surface of the substrate**," "**a plurality of second-axis conductor cells arranged on the surface of the substrate**," and that "**a capacitance between a first cell of the plurality of first-axis cells and a second cell of the plurality of second-axis cells is measured**," as in claim 17.

For this reason, Applicant respectfully submits that claims 17, 25, 35, and 44 and claims 18-23 and 26-30 that respectively depend from claims 17 and 25 are NOT anticipated under 35 U.S.C. 102(b) by Bolender and requests withdrawal of the rejections of claims 17-23, 25-30, 35, and 44.

It is also noted that claims 17, 25, 35, and 44 have been rewritten in independent form to place them in allowable condition or at least in better condition for consideration on appeal, including all of the limitations of the base claims. Applicant respectfully requests that the patentability of claims 17, 25, 35, and 44 be examined independently and separately from the rejected claims 1, 32, and 42.

Turning to newly added independent claim 46, it recites among other things "**a rigid substrate**." In this regard, Bolender discloses that to overcome the technical difficulties and requirement for compensation, a new keypad assembly design with an integrated capacitive sensor is to be formed onto a **flexible and deformable** substrate. Bolender, Figure 2; ¶ [0023], emphasis added. Thanks to the flexibility of the substrate and the sensing patterns 302 and 304 formed thereon (*See* Bolender, Figures 3A and 3B), the keymat 210 of the keypad assembly 200 is deformed by a touch of a user to depress and actuate the switch sensors 214 positioned below the keymat 210 via key posts 212. *See* Bolender, Figure 2. In this manner, when a user finger 202 exerts a downward force on one of keys 204, the key 204 is depressed which in turn causes the deformation of capacitive sensor 208 along with keymat 210. Bolender, ¶ [0024]. The depression of the key 204 further provides <u>tactile "clicking" feedback</u> to the user. Bolender, ¶ [0021], emphasis added.

Bolender further illustrates the requirement for a thin and flexible capacitive sensor 208 to enable the desired tactile response during the use of keys of the keypad assembly. Bolender, Figure 10 shown below; ¶ [0063].

FIG. 10

It is well known that a prior art reference must be considered in its entirety, *i.e.*, <u>as a whole</u>, including portions that would lead away from the claimed invention. *W.L. Gore & Associates, Inc. v. Garlock, Inc.*, 721 F.2d 1540, 220 USPQ 303 (Fed. Cir. 1983), *cert. denied*, 469 U.S. 851 (1984). MPEP § 2141.02 (VI).

Applicant respectfully submits that newly added independent claim 46 is patentable over Bolender because it not only fails to disclose "**a rigid substrate**," but instead teaches the exact opposite of what is called for in claim 46 because Bolender requires a <u>flexible</u> and deformable substrate. *See* above. If Bolender's flexible substrate were for any reason substituted with a rigid substrate, Bolender's capacitive sensor would fail to provide the required depression of the switch sensor 214 positioned below of the capacitive sensor 208 let alone failing to provide tactile "clicking" feedback to the user. *Id.* Gerpheide Decl. ¶14.

Other newly added independent claims 53, 58, 66, and 68 also recite "**a <u>rigid</u> substrate**." Therefore, for the reasons set forth regarding claim 46, Applicant respectfully submits that claims 46, 53, 58, 66, and 68 and claims 47-52, 54-57, 59-65, and 67 that depend from claims 46, 53, 58, and 66 are NEITHER anticipated under 35 U.S.C. §102(b) by Bolender.

II. Rejections Under 35 U.S.C. § 103(a)

The Examiner rejected claims 5, 10, 15, 21, 29, and 39 under 35 U.S.C. §103(a) as being unpatentable over Bolender in view of Mulligan. 12/21/10 Final Office Action, p. 15.

For the reasons set forth regarding claims 1, 6, and 32 and the dependency therefrom, claims 5, 10, 15, 21, 29, and 39 are also patentable under 35 U.S.C. §103(a) over Bolender.

Mulligan does not cure the above-noted deficiencies of claims 5, 10, 15, 21, 29, and 39. Mulligan discloses a touch-sensitive screen 210 having a touch pane layer 220 manufactured from a <u>chemically strengthened glass</u>. Mulligan, Figure 2; ¶ [0025]. As discussed above, Bolender's capacitive sensing device has a <u>flexible substrate</u>. *See* Bolender, Figure 2; ¶ [0023].

If proposed modification would render the prior art invention being modified **unsatisfactory for its intended purpose**, then there is no suggestion or motivation to make the proposed modification. *In re Gordon*, 733 F.2d 900, 221 USPQ 1125 (Fed. Cir. 1984). MPEP § 2143.01 (V).

Bolender's capacitive sensing device requires being flexible enough to deform the keymat 210, depress the switch sensor 214, and provide tactile feedback to the user. *See* Bolender, Figure 2; ¶¶ [0021], [0024]. Therefore, if Bolender's capacitive sensing device is modified to have a chemically strengthened glass (substrate), then the modification would render Bolender unsatisfactory for its intended purpose of being flexible.

From the foregoing, Bolender and Mulligan cannot be combined to teach or suggest the features of claims 1 and 32 from which claims 5, 10, 15, 21, 29, and 39 depend. Therefore, Applicant respectfully submits that claims 5, 10, 15, 21, 29, and 39 are patentable under 35 U.S.C. §103(a) over Bolender and Mulligan.

CONCLUSION

Applicant respectfully submits that it has made a patentable contribution to the art. Reconsideration of this application in view of the foregoing remarks, and withdrawal of the Examiner's rejections, are respectfully requested.

The Examiner is invited to call Applicant's undersigned representative if doing so would expedite prosecution.

Date: July 26, 2011

Respectfully submitted,

/s/ John Kefalos
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EXHIBIT A

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Appl. No.	:	11/842,747	Confirmation No.:	3897
Applicants	:	Ching-Yang Chang, *et al.*		
Filing Date	:	August 21, 2007		
Title	:	CONDUCTOR PATTERN STRUCTURE OF CAPACITIVE TOUCH PANEL		
Group Art Unit	:	2629		
Examiner	:	Hicks, Charles V.		
Docket No.	:	22271-4002		
Customer No.	:	34313		

Via: USPTO EFS Web
Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

DECLARATION UNDER 37 C.F.R. § 1.132

I, Dr. George E Gerpheide, do hereby declare that:

1. I am an electrical engineer with over 20 years of technological expertise and experience working in particular regards in the area of touchpad technology. I obtained my B.S. degree in Electrical Engineering from the Massachusetts Institute of Technology (having received honors from Tau Beta Pi and Eta KappaNu) in 1975 and a Ph.D. in Computer Science from the University of Utah (where I was an IBM Fellow) in 1981.

2. From 1978-1980 I was the principal hardware engineer at Optronics Ltd. where I co-created Par-T-Golf computer golf game with optoelectronic ball tracking. I was the founder and president of Aquila Instruments, Inc. from 1981-1983, where I created induced polarization geophysical exploration equipment. Then, from 1983-1984 I was the principal engineer at

Impulse Computer Systems, Inc. where I created a retail inventory system for partially-filled liquid containers. In 1984 I was a visiting scientist at MIT's Artificial Intelligence Laboratory as a technical liaison for a 16 degrees-of-freedom dexterous anthropomorphic robot hand. Additionally, from 1982-1986 I was an adjunct professor at the University of Utah and in 1984 became a consultant for the University's Center for Engineering Design where I co-created robot hand control algorithms. I also consulted for Dayna Communications, Inc. from 1983-1988 where I co-created the Dayna Talk network, Netware for the Macintosh computers, DaynaFile storage, and the MacCharlie PC coprocessor for the Macintosh computers. Subsequently, from 1988-1990, I was the founder and president of Proxima, Inc., where I created the first capacitance based touchpad to become commercially successful for portable computers.

3. I founded Cirque Corporation in 1991 to further develop and commercialize the capacitance-based touchpad technology I invented in my basement. This became the first commercially successful touchpad for laptop computers, and for which I was awarded US Patent No. 5,305,017. In 2003, I sold Cirque Corporation to Alps Electric Co., Ltd.,. and became a consultant to Alps in 2004. I have continued consulting on business development and technological issues for organizations that include, Hoyama, Inc., Acer Incorporated, LaunchRing, Nuvoton Technology Israel, Ltd and Ascent Partners Group, LLC. I am currently president of c2mw4, LLC which explores new technologies for areas such as education, energy, space launch, and dynamic light emitting art.

4. I am a named inventor in over 19 U.S. patents. Since 1988 I have innovated for, taught, advised and consulted various organizations and companies on capacitive touch pad technology and other areas of technology. I have not been employed by or previously received compensation as a consultant or otherwise from the Applicants,

Ching-Yang Chang and Shun-Ta Chien, or the assignee TPK Touch Solutions Incorporated. I am being compensated in connection with my preparation of this declaration at my normal hourly rate of $500.00. No part of my compensation is dependent on the outcome of this patent application response or proceeding, or any other patent application response or proceeding.

5. I have reviewed and am familiar with the United States Patent Application No. 11/842,747 and the Specification thereof, the pending claims as set forth in the Amendment and Response After Final dated February 22, 2011, the Examiner's Action dated December 21, 2010 ("Action"), the Examiner's Advisory Action dated April 26, 2011 ("Advisory Action"), the Bolender et al. U.S. Patent Publication No. US 2005/0030048 ("Bolender") and the Mulligan et al. U.S. Patent No. 6,970,160 ("Mulligan"), all in connection with this patent application 11/842,747 prosecution.

6. This declaration is being submitted to respond to the Examiner's Statements in the Action and the Advisory Action that the pending claims 1-45 (hereinafter collectively the "claims" unless a claim number(s) is specified) are rejected, with "claims 1-4, 6-9, 11-14, 16-20, 22-28, 30-38 and 40-45 …rejected under 35 U.S.C. 102(b) as being anticipated by Bolender" and "claims 5, 10, 15, 21, 29 and 39 … rejected under 35 U.S.C. 103(a) as being unpatentable over Bolender in view of Mulligan") (Action, pages 2 and 15). In this declaration, I am addressing the Examiner's rejections of the claims and new claims 46-68.

7. Based on my education, training and experience in this art, I respectfully disagree with the Examiner's comments about the rejected claims as set forth above for the reasons which follow.

8. In my experience, a person of ordinary skill in the art in this technical field would

be a person having an education in electrical engineering and five years of experience working in the field of computer input devices.

9. In my opinion, the Examiner's rejection of the claims for anticipation by Bolender is flawed. No disclosure in Bolender explains how the capacitive sensors ("cells") detect touch or the location of touch. Bolender fails to make any disclosure that the capacitance being sensed is mutual capacitance, and in my opinion Bolender does not teach a person of ordinary skill in the art to have "a capacitance between a first cell of the plurality of first-axis conductor cells and a second cell of the plurality of second-axis conductor cells to detect a position of touch" as required by claims 17, 25, 35, 44, and 68. In my opinion, a person of ordinary skill in the art would not understand that Bolender discloses that the conductive and insulating layers are transparent. Rather, in my opinion, Bolender does not disclose that the conductive and insulating layers are transparent. In this regard, Bolender discloses "capacitive sensor patterns 302 and 304 each includes a layer of substantially transparent conductive material (not shown) along with a layer of substantially opaque conductive material (shown)." Bolender ¶ 0030. Bolender also discloses, "After the etching process of the substantially transparent conductive material, a first layer of substantially opaque conductive material is deposited on top of the substantially transparent conductive material in the desired areas." *Id*. Moreover, Bolender discloses that every capacitive "cell" includes at least some opaque material overlying it, thereby providing the ability to illuminate the keys underneath and provide the capacitive sensing, as follows:

> FIG. 4 is a diagram of an exemplary capacitive sensing device 400 that illustrates selective disposing of ***substantially opaque conductive material*** in accordance with an embodiment of the present invention. It is noted that capacitive sensing device 400 can be fabricated in a manner similar to capacitive sensor patterns 300A and 300B of FIGS. 3A and 3B, respectively, as described herein. The ***solid lines of capacitive sensing device 400 represent the substantially opaque conductive material*** while the dashed lines represent the underlying substantially transparent

> conductive material within an "illumination" opening 402 of capacitive sensing device 400. In this manner, light is able to pass through opening 402 of capacitive sensing device 400 in order to illuminate one or more keys (e.g., 204) of a keypad (e.g., 206) associated with an electronic device (e.g., 100) while still providing capacitive sensing capabilities within opening 402 via the existing substantially transparent conductive material. It is understood that the underlying substantially transparent conductive material extends beneath ***the substantially opaque conductive material***.

Bolender, ¶ [0042], emphasis added. From the foregoing, a person of ordinary skill in the art would recognize that Bolender's capacitive "cells" are made to be at least in part **opaque or substantially opaque**. This is further evidenced by Bolender's requirement for an "opening" 402 through which light passes to illuminate the keys 204. *See* Bolender, Figures 2, 4, and 9; ¶¶ [0042]-[0043], [0060]-[0061]. In order to form the light-passing opening 402**, substantially opaque conductive material** is "selectively" disposed and the capacitive "cells" are specially shaped to form partial diamonds 308a, 320a, 314a and 326a. *Id.* Stated otherwise, if Bolender's capacitive "cells" were made of only transparent material, no such opening 402 would be necessary because light passes through the entirely transparent capacitive "cells". *See* Bolender, ¶ [0026].

10. In my opinion, one of ordinary skill in the art would understand that Bolender discloses having a conductive layer that is not transparent and does not disclose or even suggest "first-axis conductor cells and the second-axis conductor cells consist of a transparent conductive material" as required by the claims.

11. Furthermore, Bolender recognizes the difficulty in obtaining transparent conductor as the physical attributes of the flexible structure described in Bolender will not support a transparent conductor:

> a single layer of substantially transparent conductive material can be utilized in order to fabricate a two-dimensional capacitive sensing device. It is noted that by including the layer of substantially opaque conductive material over the substantially transparent

> conductive material, the substantially transparent conductive material is protected from damage during manufacture and/or repetitive use of the capacitive sensing device.

Bolender, ¶ 0038. Bolender discloses further that in order to produce the substantially transparent conductive material Indium Tin Oxide is preferred:

> capacitive sensor 208 can include a single sheet capacitive sensor that includes a single layer of substantially transparent conductive material, e.g., indium tin oxide (ITO), and an extra layer of substantially opaque conductive material (e.g., silver ink, carbon ink, a mixture of silver and carbon inks, etc.) that protects the substantially transparent conductive material against cracking during manufacture and/or repetitive use.

Bolender ¶ 0023. It was well known in the art as of 2007, as Bolender confirms, that ITO is inherently brittle. In this regard, I am aware of the following discussion of ITO for use in capacitive sensors:

> … the fact that ITO is generally difficult and expensive to apply as a thin film of sufficient quality. Once applied, it is brittle, and therefore can easily wear out or crack when used in applications where bending is involved.

Indium Tin Oxide and Alternative Transparent Conductor Markets, NanoMarkets LC, www.nanomarkets.net, web, April 2009, p. 1. ("NanoMarkets", copy attached hereto as Exhibit A) Although NanoMarkets was published in 2009, in my opinion the above quoted section reflects the fundamental properties of ITO, which would have been known to one skilled in the art in 2007. What is significant here is that NanoMarkets is clear objective evidence that one skilled in the art would understand that because ITO is brittle and susceptible to cracking with repetitive use in a flexible keyboard according to the disclosure in Bolender, Bolender teaches to use an opaque or substantially opaque conductor supporting the ITO layer to preserve functionality of the ITO in the flexible membrane keyboard environment of Bolender. Therefore, in my opinion, one skilled in the art would understand that Bolender fails to demonstrate a transparent conductive layer, more specifically "first-axis conductor cells and the second-axis conductor cells consist of a transparent conductive material" as required by the claims.

12. Further, with regards to the insulating layer, Bolender states:

> Within FIG. 3B, insulator 350 can be implemented in a wide variety of ways in accordance with the present embodiment. For example, insulator 350 can be implemented as, but is not limited to, a substantially transparent material, a substantially opaque material, an opaque material, and/or a printed dielectric material

Bolender ¶ 0040. Here and throughout the disclosure regarding the insulating layer, the phrase "substantially transparent" is used , which I understand from the context to be different than "transparent" because the same passage recites both "substantially opaque" and "opaque", showing that inclusion of the word "substantially" teaches a difference. Thus, one skilled in the art also would understand that Bolender teaches that both the conductive and insulating layer are not transparent.

13. Additionally, in connection with claims 11, 17, 34, and 43, and the claims depending from those claims, I disagree with the Examiner's conclusions (Action, page 6) and in my opinion, one of ordinary skill in the art would not understand Bolender to teach transmission lines formed on the substrate. Here, Bolender teaches: "It is noted that a single sheet capacitive sensor can include a single substrate that has two or more conductive sensing patterns disposed thereon in a common layer that can be utilized for, but not limited to, 2-dimensional capacitive sensing." Bolender, ¶ 0028. However, neither this discussion nor any other disclosure in Bolender explains how the capacitive sensors detect a touch; neither does Bolender disclose transmission lines formed on the substrate. For example, Figs. 3A and 3B of Bolender illustrate the capacitive sensor traces connected to each other to form separate capacitive sensor patterns, but there is no disclosure of any plurality of signal transmission lines "formed on the surface of

the substrate" and "respectively connecting each first-axis conductor assembly and each second-axis conductor assembly" as required by claim 11 and similarly by claims 17, 34, and 43 and their dependent claims.

14. Furthermore, as regards claims 46-68, one of ordinary skill in the art would not understand that Bolender teaches a rigid keypad. Bolender, in fact, teaches a keypad that is flexible and soft.

> The keypad assembly 200 for an electronic device (e.g., 100) includes keypad structure 206, a keymat 210 that is deformable to actuate switch sensors 214 via key posts 212, and capacitive sensor 208 that is coupled to the keymat 210 and the keypad structure 206. In this manner, when a user finger 202 exerts a downward force on one of keys 204, that key 204 is depressed (as shown) which in turn causes the deformation of capacitive sensor 208 along with keymat 210 which results in the corresponding key post 212 actuating one or more switch sensors 214.

Bolender, ¶ 0023. Additional confirmation is found in FIG. 5:

> Within FIG. 5, it is noted that the substantially transparent flexible substrate 506 of the present embodiment may be implemented in a wide variety of ways. For example, the substantially transparent flexible substrate 506 can be implemented with, but is not limited to, PET. Additionally, the substantially transparent flexible substrate 506 can have a diverse range of thickness which provide a desired amount of flexibility.

Bolender, ¶ 0048. *See also* Bolender Fig. 10. Therefore, in my opinion, a person of ordinary skill in the art would not understand that Bolender teaches or suggests the use of a capacitive touch pad on a rigid substrate as required by claims 46-68.

15. As discussed above, in my opinion, Bolender fails to anticipate the claims 1-4, 6-9, 11-14, 16-20, 22-28, 30-38 and 40-45 rejected by the Examiner and I do not find any disclosure in Mulligan that corrects these deficiencies. Therefore, in my opinion, neither Bolender nor Mulligan alone or in combination anticipate nor renders obvious the claims rejected by the Examiner.

The undersigned being warned that willful false statements and the like are so punishable by fine or imprisonment or both, under 18 U.S.C. 1001, and that such willful false statements and the like may jeopardize the validity of the application or any patent issuing therefrom, declares that all statements made of his own knowledge are true and that all statements made on information and belief are believed to be true.

Respectfully submitted,

George E Gerpheide
July 11, 2011

OHS EAST:160904695.1

Electronic Acknowledgement Receipt

EFS ID:	10603406
Application Number:	11842747
International Application Number:	
Confirmation Number:	3897
Title of Invention:	CONDUCTOR PATTERN STRUCTURE OF CAPACITIVE TOUCH PANEL
First Named Inventor/Applicant Name:	Ching-Yang Chang
Customer Number:	34313
Filer:	Robert M. Isackson./SHARON LEACHMAN
Filer Authorized By:	Robert M. Isackson.
Attorney Docket Number:	22271.4002
Receipt Date:	26-JUL-2011
Filing Date:	21-AUG-2007
Time Stamp:	19:17:51
Application Type:	Utility under 35 USC 111(a)

Payment information:

Submitted with Payment	no

File Listing:

Document Number	Document Description	File Name	File Size(Bytes)/ Message Digest	Multi Part /.zip	Pages (if appl.)
1	Miscellaneous Incoming Letter	Transmit_SuppRespTo_12_21_10_OA.pdf	120349 698e93ec196794cea253ace97cdc3200b05 32d8	no	1

Warnings:

Information:

2	Supplemental Response or Supplemental Amendment	Suppl_Resp_to_12_21_10_OA.pdf	469835 1d78c8d6cf933c65346d10bc2ce37f5306b23f93	no	41

Warnings:

Information:

Total Files Size (in bytes):	590184

This Acknowledgement Receipt evidences receipt on the noted date by the USPTO of the indicated documents, characterized by the applicant, and including page counts, where applicable. It serves as evidence of receipt similar to a Post Card, as described in MPEP 503.

New Applications Under 35 U.S.C. 111
If a new application is being filed and the application includes the necessary components for a filing date (see 37 CFR 1.53(b)-(d) and MPEP 506), a Filing Receipt (37 CFR 1.54) will be issued in due course and the date shown on this Acknowledgement Receipt will establish the filing date of the application.

National Stage of an International Application under 35 U.S.C. 371
If a timely submission to enter the national stage of an international application is compliant with the conditions of 35 U.S.C. 371 and other applicable requirements a Form PCT/DO/EO/903 indicating acceptance of the application as a national stage submission under 35 U.S.C. 371 will be issued in addition to the Filing Receipt, in due course.

New International Application Filed with the USPTO as a Receiving Office
If a new international application is being filed and the international application includes the necessary components for an international filing date (see PCT Article 11 and MPEP 1810), a Notification of the International Application Number and of the International Filing Date (Form PCT/RO/105) will be issued in due course, subject to prescriptions concerning national security, and the date shown on this Acknowledgement Receipt will establish the international filing date of the application.

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Appl. No.	:	11/842,747	Confirmation No.: 3897
Applicants	:	Ching-Yang Chang, *et al.*	
Filing Date	:	August 21, 2007	
Title	:	Conductor Pattern Structure Of Capacitive Touch Panel	
Group Art Unit	:	2629	
Examiner	:	Hicks, Charles V.	
Docket No.	:	22271-4002	
Customer No.	:	34313	

Via: USPTO EFS Web
Commissioner for Patents

July 26, 2011

SUPPLEMENTAL AMENDMENT TRANSMITTAL AFTER FINAL REJECTION

Transmitted herewith is a supplemental amendment after final rejection (37 CFR 1.116) in the above-identified application responsive to the Office Action dated December 21, 2010.

Applicant does not believe any fee is due, but if extension(s) of time is required, please consider this a petition therefor.

A. ☒ The Commissioner is hereby authorized to charge any required fee(s) and credit any overpayment(s) to Deposit Account No. 15-0665.
☐ Charge any additional fee required under 37 CFR 1.16 and 1.17 to Deposit Account No. 15-0665 .

B. ☐ Payment Enclosed
☐ Check ☐ Credit Card ☐ Money Order ☐ Other

Respectfully submitted,

ORRICK, HERRINGTON & SUTCLIFFE LLP

Dated: ____________________

By: /s/Anthony John Kefalos
Anthony John Kefalos
Reg. No. 61,931
(304) 231-2875

PTO/SB/06 (07-06)
Approved for use through 1/31/2007. OMB 0651-0032
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PATENT APPLICATION FEE DETERMINATION RECORD Substitute for Form PTO-875	Application or Docket Number	Filing Date	
	11/842,747	08/21/2007	☐ To be Mailed

APPLICATION AS FILED – PART I

	(Column 1)	(Column 2)	SMALL ENTITY ☐		OR	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	
☐ SEARCH FEE (37 CFR 1.16(k), (i), or (m))	N/A	N/A	N/A			N/A	
☐ EXAMINATION FEE (37 CFR 1.16(o), (p), or (q))	N/A	N/A	N/A			N/A	
TOTAL CLAIMS (37 CFR 1.16(i))	minus 20 =	*	X $ =		OR	X $ =	
INDEPENDENT CLAIMS (37 CFR 1.16(h))	minus 3 =	*	X $ =			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 $250 ($125 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))							
			TOTAL			TOTAL	

* If the difference in column 1 is less than zero, enter "0" in column 2.

APPLICATION AS AMENDED – PART II

AMENDMENT		(Column 1)		(Column 2)	(Column 3)	SMALL ENTITY		OR	OTHER THAN SMALL ENTITY	
	07/26/2011	CLAIMS REMAINING AFTER AMENDMENT		HIGHEST NUMBER PREVIOUSLY PAID FOR	PRESENT EXTRA	RATE ($)	ADDITIONAL FEE ($)		RATE ($)	ADDITIONAL FEE ($)
	Total (37 CFR 1.16(i))	* 68	Minus	** 68	= 0	X $ =		OR	X $52=	0
	Independent (37 CFR 1.16(h))	* 13	Minus	***13	= 0	X $ =		OR	X $220=	0
	☐ Application Size Fee (37 CFR 1.16(s))									
	☐ FIRST PRESENTATION OF MULTIPLE DEPENDENT CLAIM (37 CFR 1.16(j))							OR		
						TOTAL ADD'L FEE		OR	TOTAL ADD'L FEE	0

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

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

Legal Instrument Examiner:
/BRENDA MURPHY/

UNITED STATES PATENT AND TRADEMARK OFFICE

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United States Patent and Trademark Office
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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
11/842,747	08/21/2007	Ching-Yang Chang	22271.4002	3897

34313 7590 10/27/2011
ORRICK, HERRINGTON & SUTCLIFFE, LLP
IP PROSECUTION DEPARTMENT
2050 Main Street, Suite 1100
IRVINE, CA 92614

EXAMINER	
HICKS, CHARLES V	
ART UNIT	**PAPER NUMBER**
2629	

NOTIFICATION DATE	DELIVERY MODE
10/27/2011	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):

IPPROSECUTION@ORRICK.COM
vsantos@orrick.com

Examiner-Initiated Interview Summary	**Application No.** 11/842,747	**Applicant(s)** CHANG ET AL.	
	Examiner CHARLES V. HICKS	**Art Unit** 2629	

All participants (applicant, applicant's representative, PTO personnel):

(1) *CHARLES V. HICKS*. (3) *Alp Bayrumoglu*.

(2) *Robert Isackson*. (4)_____.

Date of Interview: *18 October 2011*.

Type: ☒ Telephonic ☐ Video Conference
☐ Personal [copy given to: ☐ applicant ☐ applicant's representative]

Exhibit shown or demonstration conducted: ☐ Yes ☒ No.
If Yes, brief description: _____.

Issues Discussed ☐101 ☐112 ☒102 ☒103 ☐Others
(For each of the checked box(es) above, please describe below the issue and detailed description of the discussion)

Claim(s) discussed: *1-68*.

Identification of prior art discussed: *Bolender (US 2005/0030048); Mulligan et al. (US 2004/0119701)*.

Substance of Interview
(For each issue discussed, provide a detailed description and indicate if agreement was reached. Some topics may include: identification or clarification of a reference or a portion thereof, claim interpretation, proposed amendments, arguments of any applied references etc...)

Applicant's representative discussed the fundamental differences between the instant application and the prior art of record. Applicant's representative discussed proposed amendments to overcome the prior art of record pending further search and/or consideration by examiner..

Applicant recordation instructions: It is not necessary for applicant to provide a separate record of the substance of interview.

Examiner recordation instructions: Examiners must summarize the substance of any interview of record. A complete and proper recordation of the substance of an interview should include the items listed in MPEP 713.04 for complete and proper recordation including the identification of the general thrust of each argument or issue discussed, a general indication of any other pertinent matters discussed regarding patentability and the general results or outcome of the interview, to include an indication as to whether or not agreement was reached on the issues raised.

☐ Attachment

CH	/Alexander S. Beck/ Supervisory Patent Examiner, Art Unit 2629

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NOTICE OF ALLOWANCE AND FEE(S) DUE

34313 7590 04/11/2012

ORRICK, HERRINGTON & SUTCLIFFE, LLP
IP PROSECUTION DEPARTMENT
2050 Main Street, Suite 1100
IRVINE, CA 92614

EXAMINER	
HICKS, CHARLES V	
ART UNIT	PAPER NUMBER
2629	

DATE MAILED: 04/11/2012

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
11/842,747	08/21/2007	Ching-Yang Chang	22271.4002	3897

TITLE OF INVENTION: CONDUCTOR PATTERN STRUCTURE OF CAPACITIVE TOUCH PANEL

APPLN. TYPE	SMALL ENTITY	ISSUE FEE DUE	PUBLICATION FEE DUE	PREV. PAID ISSUE FEE	TOTAL FEE(S) DUE	DATE DUE
nonprovisional	NO	$1740	$300	$0	$2040	07/11/2012

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 SMALL ENTITY status shown above.

If the SMALL ENTITY is shown as YES, verify your current SMALL ENTITY status:

A. If the status is the same, pay the TOTAL FEE(S) DUE shown above.

B. If the status above is to be removed, check box 5b on Part B - Fee(s) Transmittal and pay the PUBLICATION FEE (if required) and twice the amount of the ISSUE FEE shown above, or

If the SMALL ENTITY is shown as NO:

A. Pay TOTAL FEE(S) DUE shown above, or

B. If applicant claimed SMALL ENTITY status before, or is now claiming SMALL ENTITY status, check box 5a on Part B - Fee(s) Transmittal and pay the PUBLICATION FEE (if required) and 1/2 the ISSUE FEE shown above.

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**
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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)

34313 7590 04/11/2012

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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.

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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.
11/842,747	08/21/2007	Ching-Yang Chang	22271.4002	3897

TITLE OF INVENTION: CONDUCTOR PATTERN STRUCTURE OF CAPACITIVE TOUCH PANEL

APPLN. TYPE	SMALL ENTITY	ISSUE FEE DUE	PUBLICATION FEE DUE	PREV. PAID ISSUE FEE	TOTAL FEE(S) DUE	DATE DUE
nonprovisional	NO	$1740	$300	$0	$2040	07/11/2012

EXAMINER	ART UNIT	CLASS-SUBCLASS
HICKS, CHARLES V	2629	345-173000

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 ____________
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 credit any overpayment, to Deposit Account Number ____________ (enclose an extra copy of this form).

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).

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.

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Typed or printed name ____________ Registration No. ____________

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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
11/842,747	08/21/2007	Ching-Yang Chang	22271.4002	3897

34313 7590 04/11/2012

ORRICK, HERRINGTON & SUTCLIFFE, LLP
IP PROSECUTION DEPARTMENT
2050 Main Street, Suite 1100
IRVINE, CA 92614

EXAMINER	
HICKS, CHARLES V	
ART UNIT	PAPER NUMBER
2629	

DATE MAILED: 04/11/2012

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

The Patent Term Adjustment to date is 728 day(s). If the issue fee is paid on the date that is three months after the mailing date of this notice and the patent issues on the Tuesday before the date that is 28 weeks (six and a half months) after the mailing date of this notice, the Patent Term Adjustment will be 728 day(s).

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 Customer Service Center of the Office of Patent Publication at 1-(888)-786-0101 or (571)-272-4200.

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. 11/842,747	Applicant(s) CHANG ET AL.
	Examiner CHARLES V. HICKS	Art Unit 2629

-- 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 *amendments filed 07/26/2011*.
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 *1-68*.
4. ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
   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. ☐ A SUBSTITUTE OATH OR DECLARATION must be submitted. Note the attached EXAMINER'S AMENDMENT or NOTICE OF INFORMAL PATENT APPLICATION (PTO-152) which gives reason(s) why the oath or declaration is deficient.
6. ☐ CORRECTED DRAWINGS (as "replacement sheets") must be submitted.
   (a) ☐ including changes required by the Notice of Draftsperson's Patent Drawing Review (PTO-948) attached
   1) ☐ hereto or 2) ☐ to Paper No./Mail Date _____.
   (b) ☐ 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).
7. ☐ DEPOSIT OF and/or INFORMATION about the deposit of BIOLOGICAL MATERIAL must be submitted. Note the attached Examiner's comment regarding REQUIREMENT FOR THE DEPOSIT OF BIOLOGICAL MATERIAL.

Attachment(s)

1. ☐ Notice of References Cited (PTO-892)
2. ☐ Notice of Draftperson's Patent Drawing Review (PTO-948)
3. ☐ Information Disclosure Statements (PTO/SB/08), Paper No./Mail Date _____
4. ☐ Examiner's Comment Regarding Requirement for Deposit of Biological Material
5. ☐ Notice of Informal Patent Application
6. ☐ Interview Summary (PTO-413), Paper No./Mail Date _____ .
7. ☐ Examiner's Amendment/Comment
8. ☒ Examiner's Statement of Reasons for Allowance
9. ☐ Other _____.

CH	/Alexander S. Beck/ Supervisory Patent Examiner, Art Unit 2629

DETAILED ACTION

This communication is responsive to amendments filed 07/26/201. Claims 17, 25, 35 and 44 are amended. Claims 1-68 are pending.

Allowable Subject Matter

Claims 1-68 are allowed.

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

US PG Publication No. 2005/0030048 to Bolender et al. discloses a conductor pattern structure of a capacitive touch panel, formed on a surface of a substrate (Bolender, Fig. 3B; pg. 2, par. 28), the conductor pattern structure comprising: a plurality of first-axis conductor assemblies, each first-axis conductor assembly comprising a plurality of first-axis conductor cells arranged on the surface of the substrate along a first axis in a substantially equally-spaced manner (Bolender, Fig. 3B; pg. 3, par. 35-36), a disposition zone being delimited between adjacent ones of the first-axis conductor assemblies and between adjacent ones of the first-axis conductor cells (Bolender, Fig. 3B; pg. 3, par. 35-36),a plurality of first-axis conduction lines respectively connecting between adjacent ones of the first-axis conductor cells of each first-axis conductor assembly so that the first-axis conductor cells of each respective first-axis conductor assembly are electrically connected together (Bolender, Fig. 3B; pg. 3, par. 35-36); a plurality of insulation layers, each insulation layer of the plurality of insulation layers covering a surface of each first-axis conduction line without encompassing the adjacent first-axis conductor cells (Bolender, Figs. 3B, 12; pg. 3, par. 36; pg. 7, par. 70); a plurality of second-axis conductor assemblies, each second-axis conductor assembly comprising a plurality of second-axis conductor cells arranged on the surface of the substrate along a second axis in a substantially equally-spaced manner (Bolender, Fig. 3B; pg. 3, par. 35-36), each second-axis conductor cell being set in each disposition zone (Bolender, Fig. 3B; pg. 3, par. 35-36); a plurality of second-axis conduction lines respectively connecting between adjacent ones of the second-axis conductor cells of each second-axis conductor assembly so that the second-axis conductor cells of each respective second-axis conductor assembly are electrically connected together (Bolender, Fig. 3B; pg. 3, par. 35-36); the second-axis conduction line being extended across a surface of the insulation layer of the respective first-axis conduction line (Bolender, Fig. 3B; pg. 3, par. 35-36); wherein the conductor pattern structure further comprises a plurality of signal transmission lines formed on the surface of the substrate, each signal transmission line respectively connecting each first-axis conductor assembly and each second-axis conductor assembly (Bolender, Fig. 3B; pg. 3, par. 35-36); wherein a capacitance between a first cell of the plurality of first-axis cells and a second cell of the plurality of second-axis cells is measured to detect a position of touch (Bolender, pg. 2, par. 29); wherein each second-axis conduction line terminates on the edge of each second-axis conductor cell to the adjacent second-axis conductor cells (Bolender, Fig. 3B); wherein each second-axis conduction line terminates on the edge of each second-axis conductor cell to the adjacent second-axis conductor cells (Bolender, Fig. 3B); wherein the first-axis conductor cells, the second-axis conductor cells and the first-axis conduction lines are formed simultaneously (Bolender, pg. 2, par. 23, 28).

US PG Publication No. 2004/0119701 to Mulligan et al. discloses a touch sensing system, wherein first-axis conductor cells and second-axis conductor cells have a contour of hexagonal shape (Mulligan, pg. 4, par. 38).

As to independent claims 1, 6, 17, 25, 32, 35, 42, 44, 46, 53, 58 and 66, the prior art of reference fails to teach or suggest *wherein first-axis conductor cells and the second-axis conductor cells consist of a transparent conductive material.*

Conclusion

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."

Any inquiry concerning this communication or earlier communications from the examiner should be directed to CHARLES V. HICKS whose telephone number is (571)270-7535. The examiner can normally be reached on Monday-Thursday from 7:30 to 4:00.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Alexander Beck, can be reached on 571-272-7765. 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://portal.uspto.gov/external/portal. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

/Alexander S. Beck/
Supervisory Patent Examiner, Art Unit 2629

Issue Classification	Application/Control No.	Applicant(s)/Patent Under Reexamination
	11842747	CHANG ET AL.
	Examiner	Art Unit
	CHARLES V HICKS	2629

ORIGINAL		INTERNATIONAL CLASSIFICATION					
		CLAIMED					NON-CLAIMED
CLASS	SUBCLASS						
345	173	G	0	6	F	3 / 041 (2006.01.01)	
		G	0	9	G	5 / 00 (2006.01.01)	
		G	0	1	R	27 / 26 (2006.01.01)	

CROSS REFERENCE(S)

CLASS	SUBCLASS (ONE SUBCLASS PER BLOCK)				
345	156				
324	661				

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

Final	Original	Final	Original	Final	Original	Final	Original	Final	Original	Final	Original	Final	Original	Final	Original
1	1	17	17	33	33	49	49	65	65						
2	2	18	18	34	34	50	50	66	66						
3	3	19	19	35	35	51	51	67	67						
4	4	20	20	36	36	52	52	68	68						
5	5	21	21	37	37	53	53								
6	6	22	22	38	38	54	54								
7	7	23	23	39	39	55	55								
8	8	24	24	40	40	56	56								
9	9	25	25	41	41	57	57								
10	10	26	26	42	42	58	58								
11	11	27	27	43	43	59	59								
12	12	28	28	44	44	60	60								
13	13	29	29	45	45	61	61								
14	14	30	30	46	46	62	62								
15	15	31	31	47	47	63	63								
16	16	32	32	48	48	64	64								

/CHARLES V HICKS/ Examiner.Art Unit 2629 (Assistant Examiner)	04/03/2012 (Date)	**Total Claims Allowed:** 68	
/ALEXANDER S BECK/ Supervisory Patent Examiner.Art Unit 2629 (Primary Examiner)	04/06/2012 (Date)	O.G. Print Claim(s) 1	O.G. Print Figure 2

Search Notes	Application/Control No. 11842747	Applicant(s)/Patent Under Reexamination CHANG ET AL.
	Examiner CHARLES HICKS	Art Unit 2629

SEARCHED

Class	Subclass	Date	Examiner
345	173-184	06/07/2010	CH
178	18.01-18.08	06/07/2010	CH
341	33-34	06/07/2010	CH
Above updated		12/03/2010	CH
345	173	04/03/2012	CH

SEARCH NOTES

Search Notes	Date	Examiner
Inventor search	06/07/2010	CH
East search	06/07/2010	CH
Above updated	12/03/2010	CH
345/173 (text search only - see search history printout)	04/03/2012	CH
EAST (US PAT; US PGPUB; USOCR; EPO; JPO; DERWENT; IBM_TDB; text search only - see search history printout)	04/03/2012	CH

INTERFERENCE SEARCH

Class	Subclass	Date	Examiner
345	173	04/03/2012	CH

EAST Search History

EAST Search History (Interference)

Ref #	Hits	Search Query	DBs	Default Operator	Plurals	Time Stamp
L3	0	"345"/$.ccls. and ((conductor near3 pattern) and capacitive touch and (first$5 near3 conductor) and (second$5 near3 conductor) and adjacent and insulation layers and cover$5 and connected and (transparent near3 conductive))	USPAT; UPAD	ADJ	ON	2012/04/03 17:11
L4	0	"345"/$.ccls. and (conductor pattern and capacitive touch and (first$5 near3 conductor) and (second$5 near3 conductor) and adjacent and insulation layers and cover$5 and connected and (line near5 surface near5 insulation layer) and (transparent near3 conductive))	USPAT; UPAD	ADJ	ON	2012/04/03 17:12
L5	0	"345"/$.ccls. and ((conductor near3 pattern) and capacitive touch and (first$5 near3 conductor) and (second$5 near3 conductor) and adjacent and insulation layers and connected and (transparent near3 conductive))	USPAT; UPAD	ADJ	ON	2012/04/03 17:12
L6	0	"345"/$.ccls. and ((conductor) and capacitive touch and (first$5 near3 conductor) and (second$5 near3 conductor) and adjacent and insulation layers and connected and (transparent near3 conductive))	USPAT; UPAD	ADJ	ON	2012/04/03 17:12

4/ 3/ 2012 5:16:24 PM
C:\ Users\ chicks1\ Documents\ EAST\ Workspaces\ 11842747.wsp

EAST Search History

EAST Search History (Prior Art)

Ref #	Hits	Search Query	DBs	Default Operator	Plurals	Time Stamp
S1	1	"20080264699"	US-PGPUB; USPAT	ADJ	ON	2010/06/07 10:55
S2	2	((CHING-YANG) near2 (CHANG)).INV.	US-PGPUB; USPAT	ADJ	ON	2010/06/07 10:55
S3	8	((SHUN-TA) near2 (CHIEN)).INV.	US-PGPUB; USPAT	ADJ	ON	2010/06/07 10:56
S5	3	(S2 or S3) and capacitive touch	US-PGPUB; USPAT	ADJ	ON	2010/06/07 10:56
S6	1051	(345/173-184.ccls. or 178/18.01-18.06.ccls.) and capacitive touch	US-PGPUB; USPAT	ADJ	ON	2010/06/07 11:16
S7	270	S6 and (second or y) axis	US-PGPUB; USPAT	ADJ	ON	2010/06/07 11:17
S8	3	S6 and ((second or y) axis same cell)	US-PGPUB; USPAT	ADJ	ON	2010/06/07 11:18
S9	2	"6188391".pn. or "6137427".pn.	US-PGPUB; USPAT	ADJ	ON	2010/06/07 12:35
S10	1095	(345/173-184.ccls. or 178/18.01-18.06.ccls. or 341/33-34.ccls.) and capacitive touch	US-PGPUB; USPAT	ADJ	ON	2010/06/07 12:42
S11	1	"6188391".pn. and capacit$5	US-PGPUB; USPAT	ADJ	ON	2010/06/07 12:43
S15	1	"6188391".pn. and (touch) and substrate	US-PGPUB; USPAT	ADJ	ON	2010/06/07 12:49
S16	1	"6188391".pn. and (horizontal or vertical)	US-PGPUB; USPAT	ADJ	ON	2010/06/07 12:52
S17	1	"6188391".pn. and (horizontal or vertical) and insulat$5	US-PGPUB; USPAT	ADJ	ON	2010/06/07 12:59
S18	0	"6188391".pn. and transparent	US-PGPUB; USPAT	ADJ	ON	2010/06/07 13:15
S19	1	("6188391".pn. or "6137427".pn.) and transparent	US-PGPUB; USPAT	ADJ	ON	2010/06/07 13:15
S20	16	S10 and (transparent same capacitive same cell)	US-PGPUB; USPAT	ADJ	ON	2010/06/07 13:17
S21	8	S10 and (transparent same capacitive same cell) and (transparent same insulat$5)	US-PGPUB; USPAT	ADJ	ON	2010/06/07 13:17
S22	1	"7030860".pn. and (transparent same sensor)	US-PGPUB; USPAT	ADJ	ON	2010/06/07 13:25
S23	1	"7030860".pn. and (transparent)	US-PGPUB; USPAT	ADJ	ON	2010/06/07 13:30
S24	38	S10 and ((cell or sensor) same hexagon$4)	US-PGPUB; USPAT	ADJ	ON	2010/06/07 13:41

S25	38	S24 and (capacitive same touch)	US-PGPUB; USPAT	ADJ	ON	2010/06/07 13:42
S26	3	(US-20040119701-$).did. or (US-7030860-$ or US-6188391-$).did.	US-PGPUB; USPAT	ADJ	ON	2010/10/05 15:51
S27	2	S26 and transparent	US-PGPUB; USPAT	ADJ	ON	2010/10/05 15:51
S28	1	"20080264699" and circuit	US-PGPUB; USPAT	ADJ	ON	2010/10/06 08:14
S29	1	"7030860".pn. and (ito or idium)	US-PGPUB; USPAT	ADJ	ON	2010/10/06 08:32
S30	1	"20050030048"	US-PGPUB; USPAT	ADJ	ON	2010/12/02 14:53
S31	1	"20050030048" and insulat$5	US-PGPUB; USPAT	ADJ	ON	2010/12/03 09:18
S32	1	"20050030048" and diamond	US-PGPUB; USPAT	ADJ	ON	2010/12/03 11:23
S33	1	"20050030048" and transparent	US-PGPUB; USPAT	ADJ	ON	2010/12/03 11:55
S34	1	"20050030048" and (transparent same line)	US-PGPUB; USPAT	ADJ	ON	2010/12/03 11:59
S35	1	"20050030048" and (transparent same substrate)	US-PGPUB; USPAT	ADJ	ON	2010/12/03 12:02
S36	1	"20050030048" and (transparent same insulat$5)	US-PGPUB; USPAT	ADJ	ON	2010/12/03 12:03
S37	0	"20050030048" and (hexagon$5)	US-PGPUB; USPAT	ADJ	ON	2010/12/03 12:04
S38	1	"20050030048" and (transparent same sensor)	US-PGPUB; USPAT	ADJ	ON	2010/12/03 13:06
S39	1	"20050030048" and (substrate)	US-PGPUB; USPAT	ADJ	ON	2010/12/03 14:34
S40	1	"20050030048" and (sensor)	US-PGPUB; USPAT	ADJ	ON	2010/12/03 14:38
S41	1	"20050030048" and (ito or indium)	US-PGPUB; USPAT	ADJ	ON	2010/12/03 15:26
S42	1	"20050030048" and (capacit$5)	US-PGPUB; USPAT	ADJ	ON	2010/12/03 15:33
S43	1	"20050030048" and (conductor or line)	US-PGPUB; USPAT	ADJ	ON	2010/12/03 15:49
S44	1	"20050030048" and (formed)	US-PGPUB; USPAT	ADJ	ON	2010/12/03 16:24
S45	1	"20050030048" and (single sheet)	US-PGPUB; USPAT	ADJ	ON	2010/12/03 16:28
S46	1	"20080264699" and method	US-PGPUB; USPAT	ADJ	ON	2010/12/03 17:35
S47	1	"20080264699" and construct$5	US-PGPUB; USPAT	ADJ	ON	2010/12/03 17:40
S48	1	"20050030048" and (transparent and conductive)	US-PGPUB; USPAT	ADJ	ON	2011/04/20 15:52
S49	0	"20080264699" and measured	US-PGPUB; USPAT	ADJ	ON	2011/04/20 16:08
S50	0	"20080264699" and measure	US-PGPUB; USPAT	ADJ	ON	2011/04/20 16:08
S51	0	"20080264699" and	US-PGPUB; USPAT	ADJ	ON	2011/04/20

		capacitance between				16:09
S52	1	"20080264699"	US-PGPUB; USPAT	ADJ	ON	2011/04/20 16:09
S53	0	"20080264699" and meas$7	US-PGPUB; USPAT	ADJ	ON	2011/04/20 16:15
S54	1	"20080264699" and detect$4	US-PGPUB; USPAT	ADJ	ON	2011/04/20 16:23
S55	3	(US-20040119701-$).did. or (US-7030860-$ or US-6188391-$).did.	US-PGPUB; USPAT	ADJ	ON	2011/04/20 16:24
S56	1	S55 and measur$4	US-PGPUB; USPAT	ADJ	ON	2011/04/20 16:24
S57	1	"20080264699" and "16a"	US-PGPUB; USPAT	ADJ	ON	2011/04/20 16:28
S58	0	"20080264699" and motion	US-PGPUB; USPAT	ADJ	ON	2011/04/20 18:03
S59	3	(US-20040119701-$).did. or (US-7030860-$ or US-6188391-$).did.	US-PGPUB; USPAT	ADJ	ON	2011/04/20 18:04
S60	2	S59 and motion	US-PGPUB; USPAT	ADJ	ON	2011/04/20 18:04
S61	0	"20080264699" and rigid	US-PGPUB; USPAT	ADJ	ON	2011/04/21 07:07
S62	1	"20050030048" and (transparent and conductive) and opaque	US-PGPUB; USPAT	ADJ	ON	2011/04/21 07:26
S65	1	"20050030048" and (capacit$5)	US-PGPUB; USPAT	ADJ	ON	2011/04/21 07:36
S66	10770	345/173.ccls.	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	ADJ	ON	2012/04/03 15:58
S67	487	345/173.ccls. and conductor and pattern and substrate	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	ADJ	ON	2012/04/03 15:59
S68	247	345/173.ccls. and conductor and pattern and substrate and axis	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	ADJ	ON	2012/04/03 15:59
S69	136	345/173.ccls. and conductor and pattern and substrate and (conductor near5 transparent)	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	ADJ	ON	2012/04/03 16:00
S70	17	345/173.ccls. and conductor and pattern and single substrate and (conductor near5 transparent)	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	ADJ	ON	2012/04/03 16:00

4/3/2012 5:16:06 PM
C:\Users\chicks1\Documents\EAST\Workspaces\11842747.wsp

Index of Claims	**Application/Control No.** 11842747	**Applicant(s)/Patent Under Reexamination** CHANG ET AL.
	Examiner CHARLES HICKS	**Art Unit** 2629

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

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

CLAIM		DATE								
Final	Original	06/07/2010	12/03/2010	04/03/2012						
1	1	✓	✓	=						
2	2	✓	✓	=						
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33	33		✓	=						
34	34		✓	=						
35	35		✓	=						
36	36		✓	=						

Index of Claims	Application/Control No. 11842747	Applicant(s)/Patent Under Reexamination CHANG ET AL.
	Examiner CHARLES HICKS	Art Unit 2629

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

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

CLAIM		DATE								
Final	Original	06/07/2010	12/03/2010	04/03/2012						
37	37		✓	=						
38	38		✓	=						
39	39		✓	=						
40	40		✓	=						
41	41		✓	=						
42	42		✓	=						
43	43		✓	=						
44	44		✓	=						
45	45		✓	=						
46	46			=						
47	47			=						
48	48			=						
49	49			=						
50	50			=						
51	51			=						
52	52			=						
53	53			=						
54	54			=						
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56	56			=						
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59	59			=						
60	60			=						
61	61			=						
62	62			=						
63	63			=						
64	64			=						
65	65			=						
66	66			=						
67	67			=						
68	68			=						

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). Block 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: Legibly mark-up with any corrections or use Block 1)

ORRICK, HERRINGTON & SUTCLIFFE, LLP
IP PROSECUTION DEPARTMENT
4 PARK PLAZA - SUITE 1600
IRVINE, CA 92614-2558

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

Certificate of Transmission

I hereby certify that this Fee(s) Transmittal is being filed via EFS-WEB, Mail Stop ISSUE FEE or being facsimile transmitted to the USPTO (571) 273-2885, on the date indicated below.

Sharon B. Leachman (E-Filer's name)

(signature) /s/Sharon B. Leachman

April 23, 2012 (Date)

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
11/842,747	08/21/2007	Ching-Yang Chang	22271-4002	3897

TITLE OF INVENTION: CONDUCTOR PATTERN STRUCTURE OF CAPACITIVE TOUCH PANEL

APPLN. TYPE	SMALL ENTITY	ISSUE FEE	PUBLICATION FEE	TOTAL FEE(S) DUE	DUE DATE
nonprovisional	NO	$1740	$300	$2,040	07/11/2012

EXAMINER	ART UNIT	CLASS-SUBCLASS
HICKS, CHARLES V	2629	345-173000

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 Customer Number is required.**

2. For printing on the patent front page, list (1) the names of up to 3 registered patent attorneys or agents OR, alternatively, (2) the name of a single firm (having as a member a registered attorney or agent) and the names of up to 2 registered patent attorneys or agents. If no name is listed, no name will be printed.
1. ________
2. Orrick Herrington & Sutcliffe, LLP
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. Inclusion of assignee data is only appropriate when an assignment has been previously submitted to the USPTO or is being submitted under separate cover. Completion of this form is NOT a substitute for filing an assignment.

(A) NAME OF ASSIGNEE

TPK TOUCH SOLUTIONS INC.

(B) ADDRESS:

14F., NO. 136, SEC. 3, REN-AI RD.
DA-AN DISTRICT
TAIPEI CITY, TAIWAN 106

Please check the appropriate assignee category or categories (will no be printed on the patent) ☐ individual ☒ corporation or other private group entity ☐ government

4a. The following fee(s) are enclosed:
☒ Issue Fee
☒ Publication Fee
☐ 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 to charge the required fee(s), or credit any overpayment, to Deposit Account Number 15-0665 (enclose an extra copy of this form).

5. **Change of 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 application; a registered attorney or agent; or the assignee or other party in interest as shown by records of the United States Patent and Trademark Office.

Authorized Signature /s/Robert M. Isackson

Date April 23, 2012

Typed or Printed name Robert M. Isackson

Registration No. 31,110

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Appl. No.	:	11/842,747	Confirmation No.:	3897
Applicants	:	Ching-Yang Chang, *et al.*		
Filing Date	:	August 21, 2007		
Title	:	Conductor Pattern Structure Of Capacitive Touch Panel		
Group Art Unit	:	2629		
Examiner	:	Hicks, Charles V.		
Docket No.	:	22271-4002		
Customer No.	:	34313		

Via: USPTO EFS Web
Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

COMMENTS ON STATEMENT OF REASONS FOR ALLOWANCE

Dear Sir:

In the Examiner's statement of reasons for allowance in the Notice of Allowance and Issue Fee Due mailed April 11, 2012, the Examiner described certain aspects of the alleged disclosures of the Bolender al. U.S. Patent Pub. No. 2005/0030048 and Mulligan et al. U.S. Patent Pub. No. 2004/0019701 prior art references and noted:

> As to independent claims 1, 6, 17 25, 32, 35, 42, 44, 46, 53, 58, and 66, the prior art of record fails to teach or suggest *wherein first-axis conductor cells and the second-axis conductor cells consist of a transparent conductive material.*

(Notice of Allowability, at 4) (emphasis in original).

Applicants respectfully submit that while the Examiner's statement is correct, the art of record also does not teach or suggest the claimed invention directed to, in combination with the transparent conductive material of the first- and second-axis conductor cells, such features as "a plurality of transmission lines formed on the surface of the substrate" as required by claim 11, or "a capacitance between a first cell of the plurality of first-axis cells and a second cell of the plurality of second-axis cells is measured to detect a position of touch", as in claim 17, or "a rigid substrate" as called for in independent claims 46, 53, 66 and 68.

Date: April 23, 2012

Respectfully submitted,

/s/ Robert M. Isacskon
Robert M. Isackson
Reg. No. 31,110
Tel.: (212) 506 5280

Orrick, Herrington & Sutcliffe LLP
1050 Main Street, Suite 1100
Irvine CA 92614-8255
Tel. 949-567-6700
Fax: 949-567-6710

Electronic Patent Application Fee Transmittal

Application Number:	11842747
Filing Date:	21-Aug-2007
Title of Invention:	CONDUCTOR PATTERN STRUCTURE OF CAPACITIVE TOUCH PANEL
First Named Inventor/Applicant Name:	Ching-Yang Chang
Filer:	Robert M. Isackson./SHARON LEACHMAN
Attorney Docket Number:	22271.4002

Filed as Large Entity

Utility under 35 USC 111(a) Filing Fees

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	1740	1740
Publ. Fee- early, voluntary, or normal	1504	1	300	300

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

Electronic Acknowledgement Receipt

EFS ID:	12610170
Application Number:	11842747
International Application Number:	
Confirmation Number:	3897
Title of Invention:	CONDUCTOR PATTERN STRUCTURE OF CAPACITIVE TOUCH PANEL
First Named Inventor/Applicant Name:	Ching-Yang Chang
Customer Number:	34313
Filer:	Robert M. Isackson./SHARON LEACHMAN
Filer Authorized By:	Robert M. Isackson.
Attorney Docket Number:	22271.4002
Receipt Date:	23-APR-2012
Filing Date:	21-AUG-2007
Time Stamp:	19:23:28
Application Type:	Utility under 35 USC 111(a)

Payment information:

Submitted with Payment	yes
Payment Type	Deposit Account
Payment was successfully received in RAM	$2040
RAM confirmation Number	6771
Deposit Account	150665
Authorized User	

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)	4002_IssueFeeTransmittal.pdf	1053338 32a23c943641d0ddd0af8c8aa8815b677ba4b18c	no	1
Warnings:					
Information:					
2	Amendment after Notice of Allowance (Rule 312)	4002_ResponseAfterAllowance.pdf	894822 00d2ae5aedffca2540d2d19017c3acf9f24da0ce	no	2
Warnings:					
Information:					
3	Fee Worksheet (SB06)	fee-info.pdf	31774 2304525918f12a5fcdc609969cf0854ab9061874	no	2
Warnings:					
Information:					
		Total Files Size (in bytes):	1979934		

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.
11/842,747	07/10/2012	8217902	22271.4002	3897

34313 7590 06/20/2012

ORRICK, HERRINGTON & SUTCLIFFE, LLP
IP PROSECUTION DEPARTMENT
2050 Main Street, Suite 1100
IRVINE, CA 92614

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 939 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):

Ching-Yang Chang, Taipei, TAIWAN;
Shun-Ta Chien, Taipei, TAIWAN;