

(12) **United States Patent**
Philipp

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(54) **TOUCHSCREEN ELECTRODE CONFIGURATION**
(75) Inventor: **Harald Philipp**, Hamble (GB)
(73) Assignee: **Atmel Corporation**, San Jose, CA (US)
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8,031,174 B2 10/2011 Hamblin
8,040,326 B2 10/2011 Hotelling
8,049,732 B2 11/2011 Hotelling
8,179,381 B2 5/2012 Frey
8,179,384 B2 5/2012 Sakashita
8,217,902 B2 7/2012 Chang
2002/0186210 A1 12/2002 Itoh
2008/0117186 A1 5/2008 Wang
2008/0309635 A1 12/2008 Matsuo
2009/0153502 A1 6/2009 Jiang
2009/0184940 A1* 7/2009 Silk et al. 345/173
2009/0219258 A1* 9/2009 Geaghan et al. 345/173
2009/0273577 A1* 11/2009 Chen et al. 345/174
2009/0315854 A1 12/2009 Matsuo
2010/0026664 A1* 2/2010 Geaghan 345/174

(Continued)

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FOREIGN PATENT DOCUMENTS

JP 2008-145998 6/2008
W● W● 2012/129247 9/2012

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G08C 21/00 (2006.01)
G06F 3/045 (2006.01)
G06F 3/033 (2013.01)
G06F 3/044 (2006.01)

OTHER PUBLICATIONS

"2009--Conductive Inkjet Technology", [online]. [retrieved Apr. 20, 2010]. Retrieved from the Internet: <URL: <http://www.conductiveinkjet.com/about-us/latest-news/2009.aspx>>, 1 pg.

(Continued)

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USPC 345/173; 178/18.01; 178/18.02;
178/18.03; 178/18.05; 178/18.06; 178/19.03

Primary Examiner — Alexander S Beck

Assistant Examiner — Nguyen H Truong

(74) *Attorney, Agent, or Firm* — Baker Botts LLP

(58) **Field of Classification Search**

USPC 345/173-178; 178/18.01-18.03, 18.05,
178/18.06, 19.03

(57)

ABSTRACT

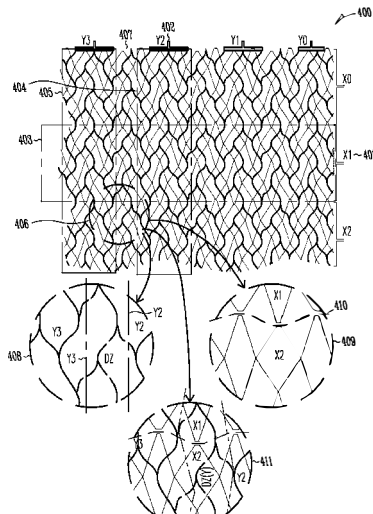
A touchscreen includes touchscreen electrode elements distributed across an active area of a substrate, and the touchscreen overlays a display. The touchscreen electrode elements are configured to avoid creating moiré patterns between the display and the touchscreen, such as angled, wavy, zig-zag, or randomized lines. In a further example, the electrodes form a mesh pattern configured to avoid moiré patterns.

(56) **References Cited**

U.S. PATENT DOCUMENTS

7,663,607 B2 2/2010 Hotelling
7,864,503 B2 1/2011 Chang
7,875,814 B2* 1/2011 Chen et al. 178/18.07
7,920,129 B2 4/2011 Hotelling
8,031,094 B2 10/2011 Hotelling

11 Claims, 7 Drawing Sheets



(56)

References Cited

U.S. PATENT DOCUMENTS

2010/0028811	A1	2/2010	Geaghan	
2010/0045614	A1*	2/2010	Gray et al.	345/173
2010/0079387	A1	4/2010	Rosenblatt	
2010/0328228	A1	12/2010	Elias	
2011/0032193	A1	2/2011	Szalkowski	
2011/0095996	A1*	4/2011	Yilmaz	345/173
2012/0242588	A1	9/2012	Myers	
2012/0242592	A1	9/2012	Rothkopf	
2012/0243151	A1	9/2012	Lynch	
2012/0243719	A1	9/2012	Franklin	
2013/0076612	A1	3/2013	Myers	

OTHER PUBLICATIONS

“Cambrios Technologies Corporation Awarded Department of Defense Contract for Flexible Solar Cells”, [online]. [retrieved Apr. 20, 2010]. Retrieved from the Internet: <URL: <http://www.cambrios.com/200/DOD_Release.htm>, (Apr. 12, 2010), 2 pgs.

“New Silver Conductive Inks Target High-Growth Touch Screen and LED Markets”, [online]. [retrieved Apr. 20, 2010]. Retrieved from the Internet: <URL: http://www2.dupont.com/MCM/en_US/news_events/article20100413.html>, (Apr. 13, 2010), 3 pgs.

“Printing of Antennas and Flexible Circuits”, *Core Applications & Technologies*, (c) 2009 Conductive Inkjet Technology Ltd., (Oct. 2009), 23 pgs.

Hörteis, M., et al., “Fine Line Printed and Plated Contacts on High HMIC Emitters Enabling 20% Cell Efficiency”, *2009 34th IEEE Photovoltaic Specialists Conference (PVSC)*, (2009), 000060-000065.

U.S. Appl. No. 13/288,385, filed Nov. 3, 2011, Yilmaz.

Office Action for U.S. Appl. No. 13/312,702, Mar. 16, 2012.

U.S. Appl. No. 61/454,936, filed Mar. 21, 2011, Myers.

U.S. Appl. No. 61/454,950, filed Mar. 21, 2011, Lynch.

U.S. Appl. No. 61/454,894, filed Mar. 21, 2011, Rothkopf.

Office Action for U.S. Appl. No. 13/408,762, May 9, 2012.

Office Action for U.S. Appl. No. 13/408,762, Sep. 7, 2012.

* cited by examiner

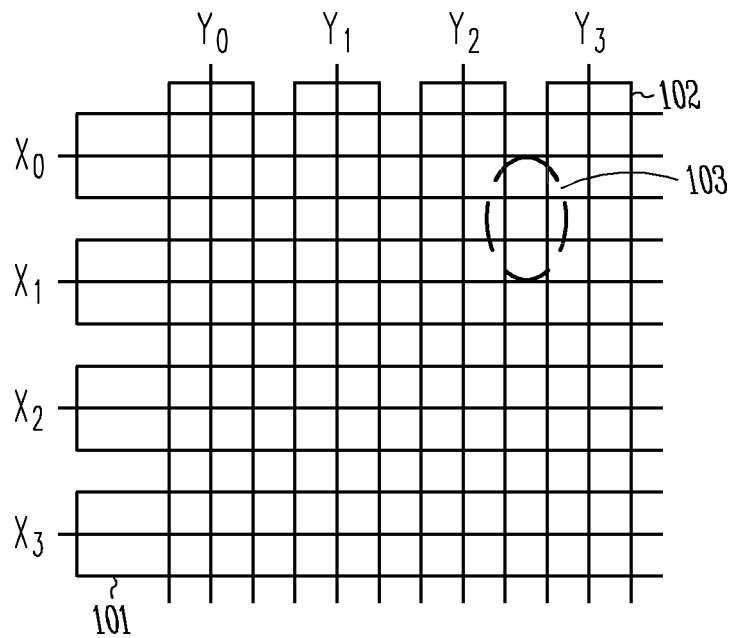


Fig. 1

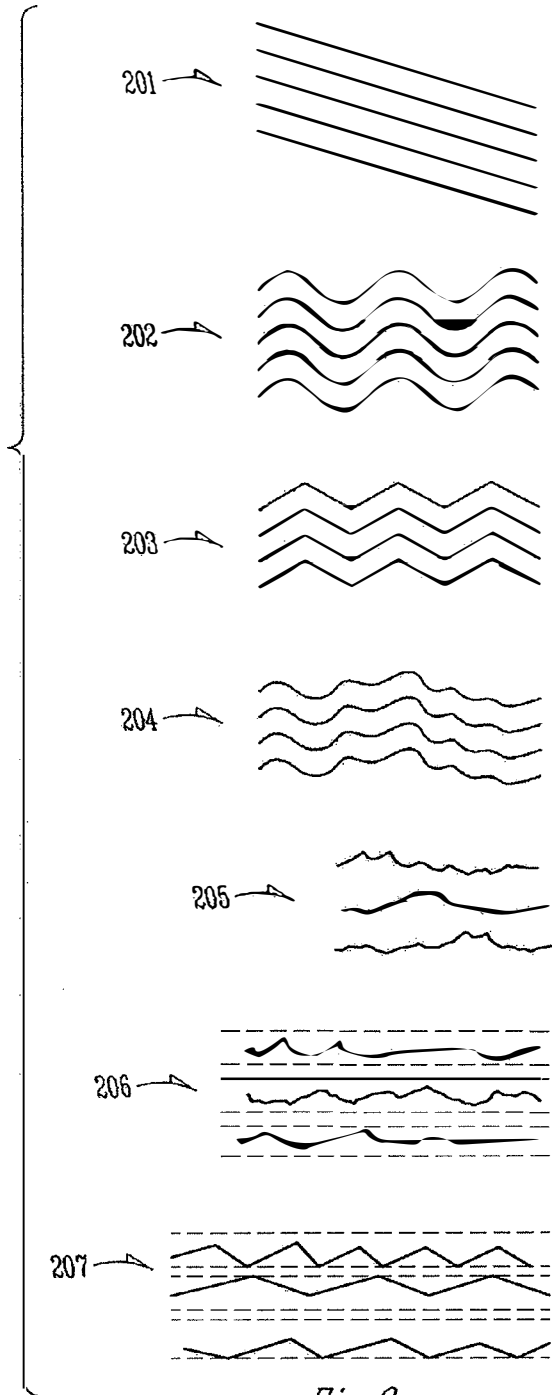


Fig. 2

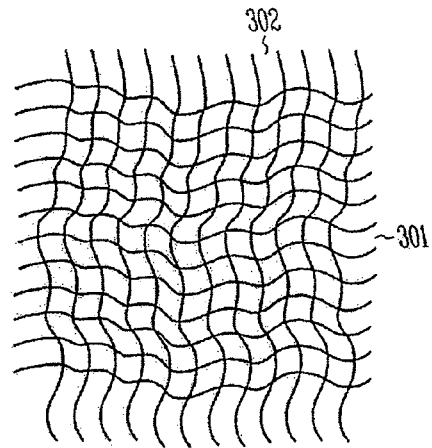


Fig. 3

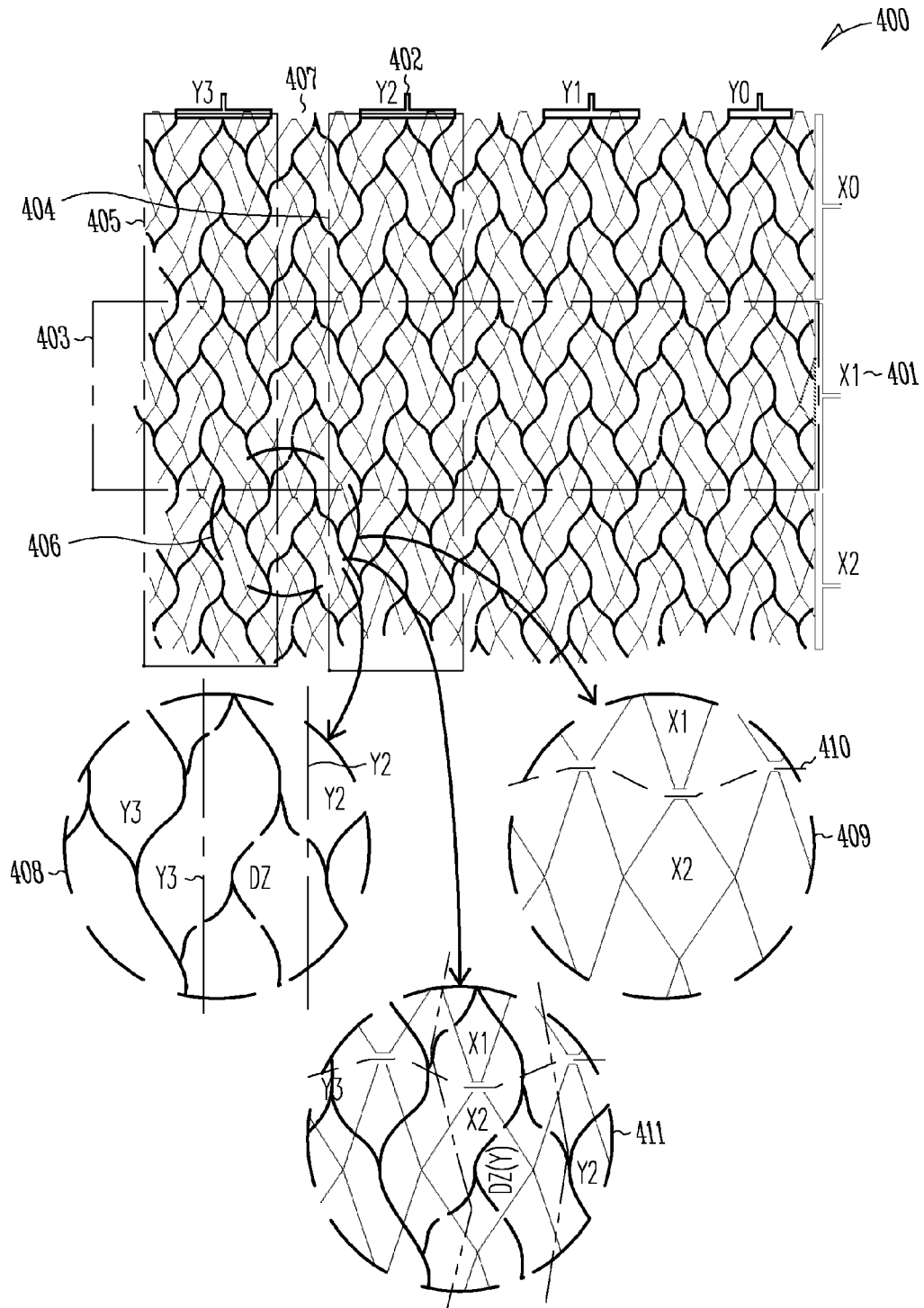


Fig. 4

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