

EXHIBIT 6

US008471994B2

(12) **United States Patent**
Kataoka et al.(10) **Patent No.:** **US 8,471,994 B2**
(45) **Date of Patent:** **Jun. 25, 2013**(54) **LIQUID CRYSTAL DISPLAY DEVICE AND METHOD FOR FABRICATING THE SAME**(75) Inventors: **Shingo Kataoka**, Kawasaki (JP); **Arihiro Takeda**, Kawasaki (JP); **Takahiro Sasaki**, Kawasaki (JP); **Tsutomu Seino**, Kawasaki (JP); **Yoshio Koike**, Kawasaki (JP); **Hidefumi Yoshida**, Kawasaki (JP); **Yuichi Inoue**, Kawasaki (JP); **Kazutaka Hanaoka**, Kawasaki (JP); **Seiji Tanuma**, Kawasaki (JP); **Takatoshi Mayama**, Kawasaki (JP); **Kimiaki Nakamura**, Kawasaki (JP); **Hideo Chida**, Kawasaki (JP); **Seiji Doi**, Kawasaki (JP); **Tetsuya Fujikawa**, Kawasaki (JP); **Takashi Takagi**, Kawasaki (JP); **Hiroyasu Inoue**, Kawasaki (JP)(73) Assignee: **Sharp Kabushiki Kaisha**, Osaka (JP)

(*) Notice: Subject to any disclaimer, the term of this patent is extended or adjusted under 35 U.S.C. 154(b) by 0 days.

(21) Appl. No.: **13/051,386**(22) Filed: **Mar. 18, 2011**(65) **Prior Publication Data**

US 2011/0216274 A1 Sep. 8, 2011

Related U.S. Application Data

(60) Division of application No. 12/268,722, filed on Nov. 11, 2008, now Pat. No. 7,952,675, which is a continuation of application No. 11/542,308, filed on Oct. 2, 2006, now Pat. No. 7,486,366, which is a division of application No. 09/903,010, filed on Jul. 11, 2001, now Pat. No. 7,145,622.

(30) **Foreign Application Priority Data**

Sep. 27, 2000 (JP) 2000-295266

(51) **Int. Cl.**
G02F 1/1343 (2006.01)(52) **U.S. Cl.**
USPC **349/143**; 349/130; 349/139; 349/142; 349/144; 257/E21.31; 257/E21.302; 257/E21.414(58) **Field of Classification Search**
USPC 349/130, 139, 142-144
See application file for complete search history.(56) **References Cited****U.S. PATENT DOCUMENTS**4,834,509 A 5/1989 Gunjima et al.
5,566,008 A * 10/1996 Yoshida et al. 349/86

(Continued)

FOREIGN PATENT DOCUMENTSEP 272585 6/1988
EP 0 884 626 12/1998

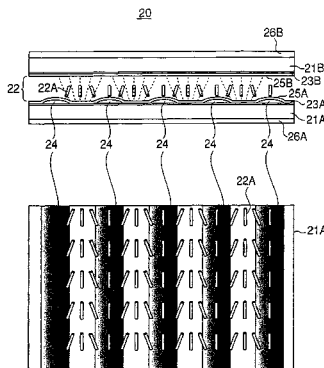
(Continued)

OTHER PUBLICATIONSGolden View Display Inc., webpage, http://www.goldenviewdisplay.com/lcd_explained.html, pp. 1-3, downloaded Mar. 7, 2013.

(Continued)

Primary Examiner — A. Sefer(74) *Attorney, Agent, or Firm* — Greer Burns & Crain, Ltd.(57) **ABSTRACT**

A liquid crystal display device including first and second substrates, with a liquid crystal layer sealed therebetween; and first and second electrodes formed, respectively, on the first and second substrates. A first molecule orientation film is formed on the first substrate so as to cover the first electrode and a second molecule orientation film formed on the second substrate so as to cover the second electrode. A polarizer with a light absorption axis P is provided outside of the first substrate, and an analyzer with a light absorption axis A is provided outside of the second substrate. The light absorption axis A crosses the light absorption axis P. A plurality of micro structures are associated with at least one of the first and second electrodes, wherein the micro structures are obliquely arranged with respect to the light absorption axis P and the light absorption axis A.

21 Claims, 65 Drawing Sheets

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U.S. PATENT DOCUMENTS

5,691,791	A *	11/1997	Nakamura et al.	349/113
5,959,763	A	9/1999	Bozler et al.	
6,452,653	B1	9/2002	Yamanaka et al.	
6,671,019	B1	12/2003	Petschek et al.	
6,690,441	B2	2/2004	Moriya	
6,710,837	B1	3/2004	Song et al.	
6,724,452	B1	4/2004	Takeda et al.	
2003/0071952	A1	4/2003	Yoshida et al.	
2003/0202146	A1	10/2003	Takeda et al.	
2004/0075798	A1	4/2004	Inoue et al.	
2004/0080697	A1	4/2004	Song et al.	
2005/0128397	A1	6/2005	Sasaki et al.	
2005/0259209	A1	11/2005	Takeda et al.	
2009/0290111	A1	11/2009	Sasaki et al.	

FOREIGN PATENT DOCUMENTS

JP	61-011725	1/1986
JP	10-239669	9/1998
JP	11-242225	9/1999
JP	11-352489	12/1999
JP	11-352491	12/1999
JP	11352490	12/1999
JP	2000-155317	6/2000
JP	2000-193976	7/2000

OTHER PUBLICATIONS

Liquid crystal display, Wikipedia, the free encyclopedia, webpage, http://en.wikipedia.org/wiki/Liquid_crystal_display, pp. 1-19, downloaded Mar. 7, 2013.

* cited by examiner

FIG. 1A
PRIOR ART

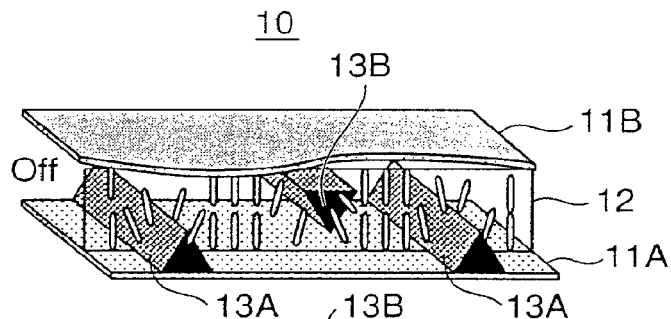


FIG. 1B
PRIOR ART

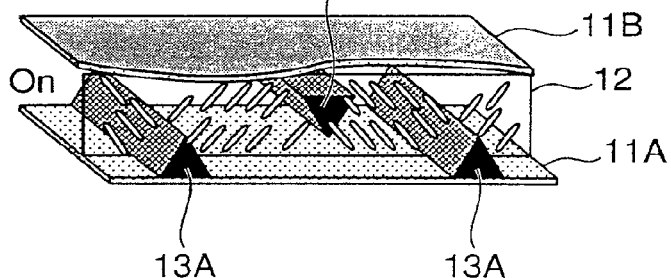
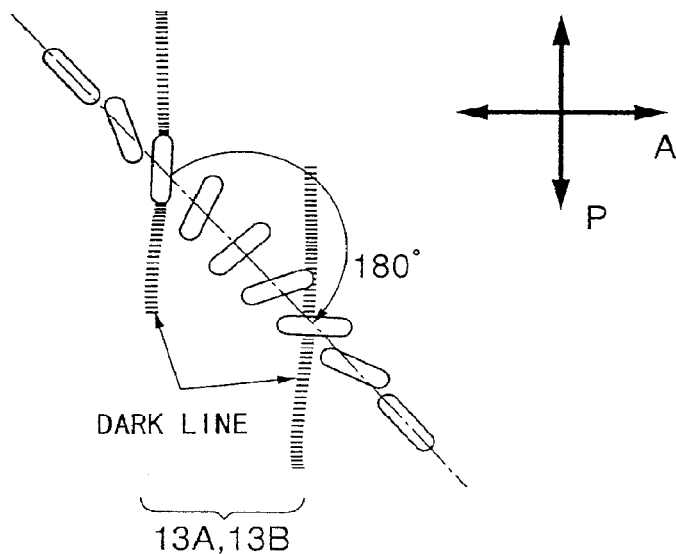
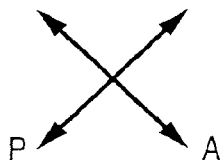
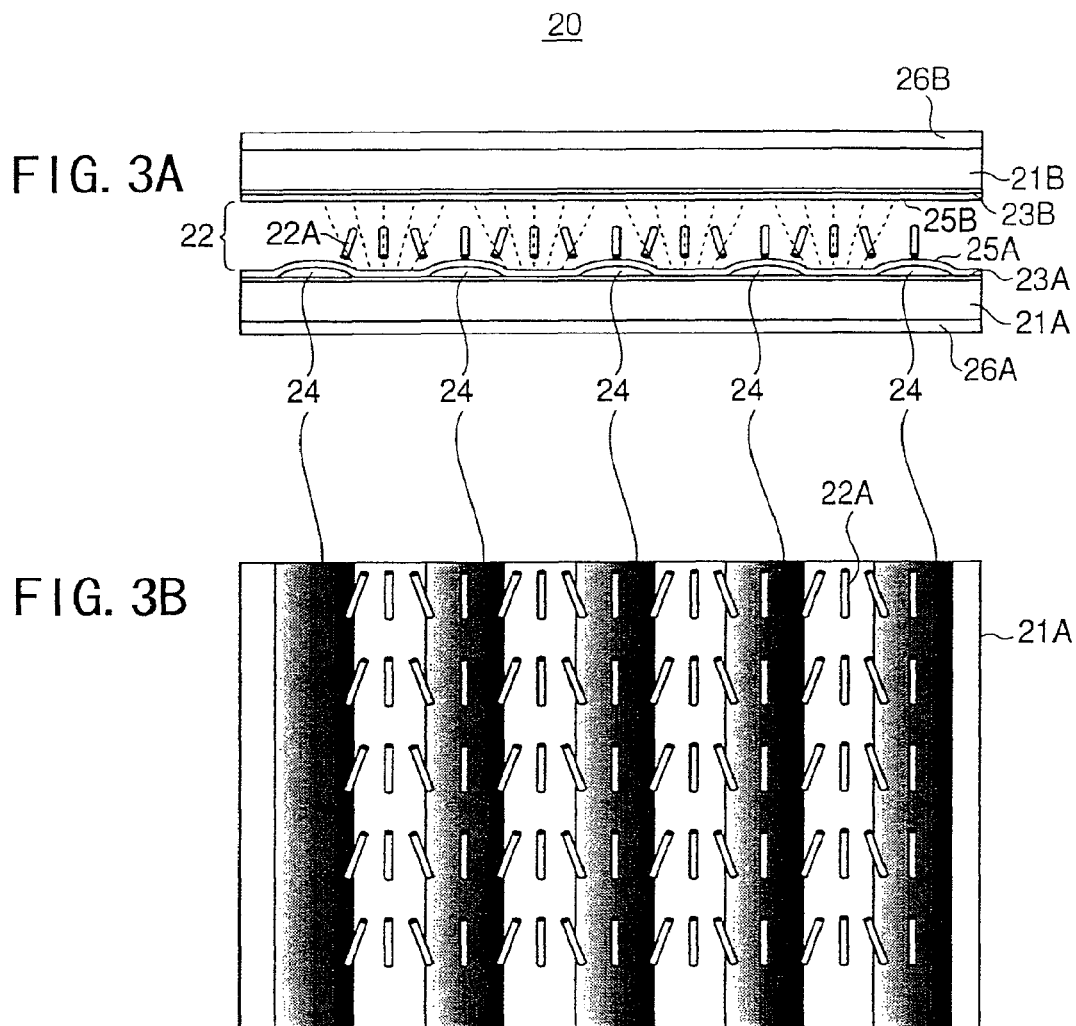


FIG. 2 PRIOR ART





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