

(12) United States Patent

Kim et al.

(10) Patent No.: US 6,580,487 B1

(45) **Date of Patent: Jun. 17, 2003**

(54) FRINGE FIELD SWITCHING LIQUID CRYSTAL DISPLAY

(75) Inventors: Eun Sik Kim, Kyoungki-do (KR); Young Keun Lee, Kyoungki-do (KR)

(73) Assignee: Boe-Hydis Technology Co., Ltd.,

Kyoungki-do (KR)

(*) Notice: Subject to any disclaimer, the term of this

patent is extended or adjusted under 35

U.S.C. 154(b) by **●** days.

(21) Appl. No.: **09/606,731**

(22) Filed: Jun. 29, 2000

(30) Foreign Application Priority Data

Jun.	29, 1999 (KR)	
(51)	Int. Cl. ⁷	G02F 1/1343
(52)	U.S. Cl	
(58)	Field of Search	

(56) References Cited

U.S. PATENT DOCUMENTS

4,542,96 ● A	9/1	985	Yang
4,643,533 A	2/1	987	Armitage
5,3 09 ,264 A	5/1	994	Lien et al.
5,576,862 A	11/1	996	Sugiyama et al.
5,914,762 A	* 6/1	999	Lee et al 349/141
5,959,7 0 8 A	9/1	999	Lee et al.
6,233,034 B1	* 5/2	00 1	Lee et al 349/141
6,256, 0 81 B1	* 7/2	00 1	Lee et al 349/141

FOREIGN PATENT DOCUMENTS

JP	55138922	10/1980
JP	57069281	4/1982
JP	58083478	5/1983
JP	60222825	11/1985
JP	©2© 71616	3/1990
JP	1116712●	6/1999
JP	11282427	10/1999

* cited by examiner

Primary Examiner—Toan Ton

(74) Attorney, Agent, or Firm—Ladas & Parry

(57) ABSTRACT

Disclosed is a fringe field switching liquid crystal display capable of improving picture quality by minimizing vertical components in a fringe field. The fringe field liquid crystal display includes: a lower substrate; a gate bus line extended on the lower substrate in a selected direction; a data bus line disposed to cross the gate bus line, thereby defining a sub pixel; a thin film transistor disposed at an intersection of the gate bus line and the data bus line; a counter electrode formed at each sub pixel and formed in shape of a rectangular plate, the counter electrode to which a common signal is continuously transmitted; and a pixel electrode electrically connected to the thin film transistor and comprising a plurality of teeth which are overlapped with the counter electrode so as to form a fringe field with the counter electrode, wherein the counter comprises a plurality of slits, and the slits are disposed between the teeth of the pixel electrode, and the counter electrode and the pixel electrode are made of a transparent conductor.

1 Claim, 5 Drawing Sheets

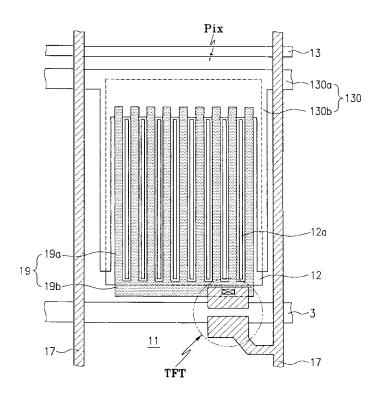




FIG.1
(PRIOR ART)

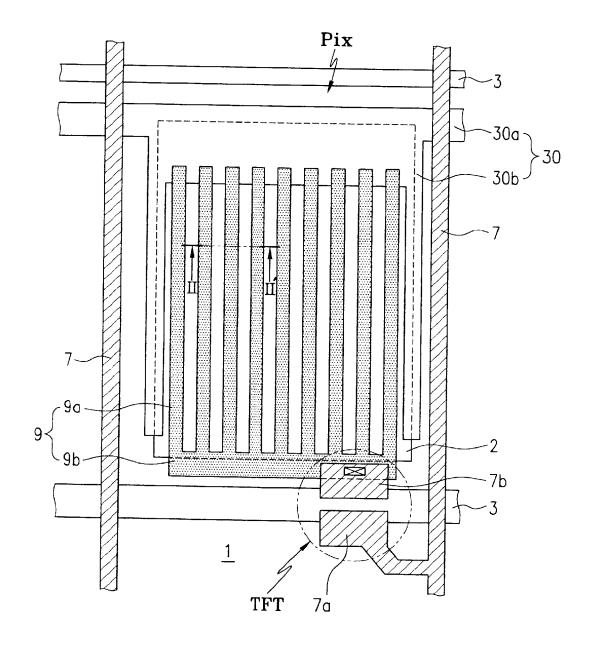


FIG.2

(PRIOR ART)

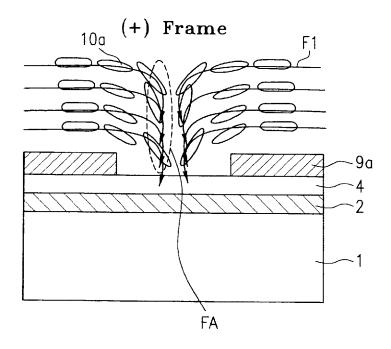


FIG.3

(PRIOR ART)

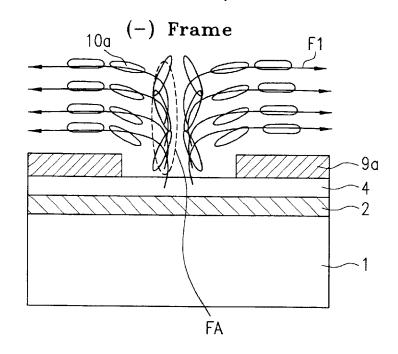


FIG.4

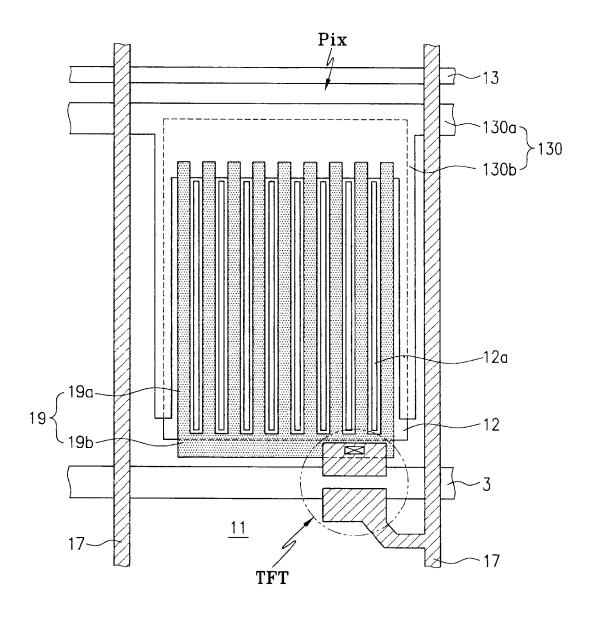
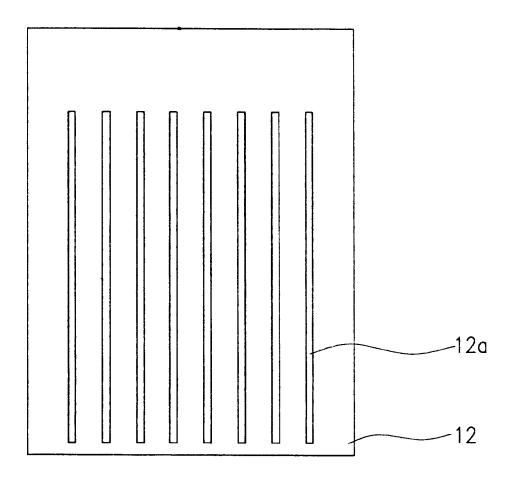




FIG.5





DOCKET A L A R M

Explore Litigation Insights



Docket Alarm provides insights to develop a more informed litigation strategy and the peace of mind of knowing you're on top of things.

Real-Time Litigation Alerts



Keep your litigation team up-to-date with **real-time** alerts and advanced team management tools built for the enterprise, all while greatly reducing PACER spend.

Our comprehensive service means we can handle Federal, State, and Administrative courts across the country.

Advanced Docket Research



With over 230 million records, Docket Alarm's cloud-native docket research platform finds what other services can't. Coverage includes Federal, State, plus PTAB, TTAB, ITC and NLRB decisions, all in one place.

Identify arguments that have been successful in the past with full text, pinpoint searching. Link to case law cited within any court document via Fastcase.

Analytics At Your Fingertips



Learn what happened the last time a particular judge, opposing counsel or company faced cases similar to yours.

Advanced out-of-the-box PTAB and TTAB analytics are always at your fingertips.

API

Docket Alarm offers a powerful API (application programming interface) to developers that want to integrate case filings into their apps.

LAW FIRMS

Build custom dashboards for your attorneys and clients with live data direct from the court.

Automate many repetitive legal tasks like conflict checks, document management, and marketing.

FINANCIAL INSTITUTIONS

Litigation and bankruptcy checks for companies and debtors.

E-DISCOVERY AND LEGAL VENDORS

Sync your system to PACER to automate legal marketing.

