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**Shimoda et al.**

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(54) **DISPLAY PANEL**

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(\* ) Notice: Subject to any disclaimer, the term of this patent is extended or adjusted under 35 U.S.C. 154(b) by 441 days.

2004/0003939 A1\* 1/2004 Nishi et al. .... 174/250  
2004/0160170 A1 8/2004 Sato et al.  
2004/0165003 A1 8/2004 Shirasaki  
2004/0256617 A1 12/2004 Yamada et al.  
2005/0062409 A1\* 3/2005 Yamazaki et al. .... 313/504

(Continued)

FOREIGN PATENT DOCUMENTS

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CN 1434668 A 8/2003

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(Continued)

OTHER PUBLICATIONS

(30) **Foreign Application Priority Data**

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(Continued)

(51) **Int. Cl.**

**H01J 1/62** (2006.01)

Primary Examiner—Aaron Williams

(52) **U.S. Cl.** ..... **313/500**; 345/44; 345/45; 313/505; 315/169.3

(74) *Attorney, Agent, or Firm*—Frishauf, Holtz, Goodman & Chick, P.C.

(58) **Field of Classification Search** ..... None  
See application file for complete search history.

(57) **ABSTRACT**

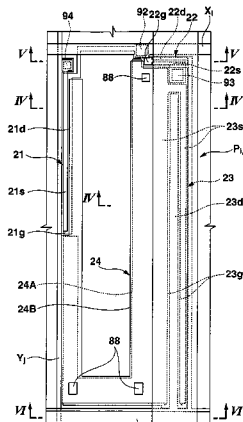
(56) **References Cited**

U.S. PATENT DOCUMENTS

5,684,365 A 11/1997 Tang et al.  
6,297,589 B1 10/2001 Miyaguchi et al.  
6,717,357 B2 4/2004 Okuyama et al.  
6,839,057 B2 1/2005 Iguchi  
7,358,529 B2 4/2008 Childs et al.  
7,402,948 B2 7/2008 Yamazaki et al.  
2003/0047730 A1\* 3/2003 Konuma ..... 257/42  
2003/0137325 A1 7/2003 Yamazaki et al.  
2003/0146693 A1\* 8/2003 Ishihara et al. .... 313/504  
2003/0151355 A1 8/2003 Hosokawa  
2003/0168992 A1 9/2003 Noguchi et al.  
2003/0193056 A1 10/2003 Takayama et al.

A display panel includes a transistor array substrate which has a plurality of transistors including at least a driving transistor, and a plurality of pixel electrodes electrically connected to the driving transistor of the plurality of transistors. A plurality of light-emitting layers are provided on the pixel electrodes. A counter electrode is provided on the light-emitting layers. Each of a plurality of interconnections is arranged between the pixel electrodes adjacent to each other and electrically connected to the counter electrode.

**21 Claims, 21 Drawing Sheets**



U.S. PATENT DOCUMENTS

2005/0073264 A1\* 4/2005 Matsumoto ..... 315/169.3  
 2005/0088086 A1\* 4/2005 Park et al. .... 313/506  
 2005/0258741 A1\* 11/2005 Kim et al. .... 313/503  
 2006/0066535 A1 3/2006 Shirasaki et al.

TW 591574 A 5/2002  
 TW 521336 A 2/2003  
 TW 584824 A 4/2004  
 TW 594628 A 6/2004  
 WO WO 03/079441 A1 9/2003  
 WO WO 2004/019314 A1 3/2004

FOREIGN PATENT DOCUMENTS

CN 1437177 A 8/2003  
 EP 1 331 666 A2 7/2003  
 EP 1 349 208 A1 10/2003  
 JP 8-330600 A 12/1996  
 JP 2001-195008 A 7/2001  
 JP 2002-352963 A 12/2002  
 JP 2003-076327 A 3/2003  
 JP 2003-186420 A 7/2003  
 JP 2003-288994 A 10/2003  
 JP 2003-317971 A 11/2003  
 JP 2004-258172 A 9/2004  
 JP 2006-004731 A 1/2006  
 KR 2002-0000875 A 1/2002  
 KR 10-2004-0051611 A 6/2004

OTHER PUBLICATIONS

Japanese Office Action (and English translation thereof) dated Apr. 30, 2008 issued in a counterpart Japanese Application in *related* U.S. Appl. No. 11/235,579.  
 Chinese Office Action (and English translation thereof) dated Jun. 6, 2008, issued in a counterpart Chinese Application.  
 Chinese Office Action (and English translation thereof) dated Jun. 6, 2008, issued in *related* U.S. Appl. No. 11/235,579 in counterpart Chinese Application No. 2005800157971.  
 Japanese Office Action (and English translation thereof) dated Jun. 10, 2008, issued in a counterpart Japanese Application.  
 Japanese Office Action (and English translation thereof) dated Sep. 9, 2008, issued in a counterpart Japanese Application.

\* cited by examiner

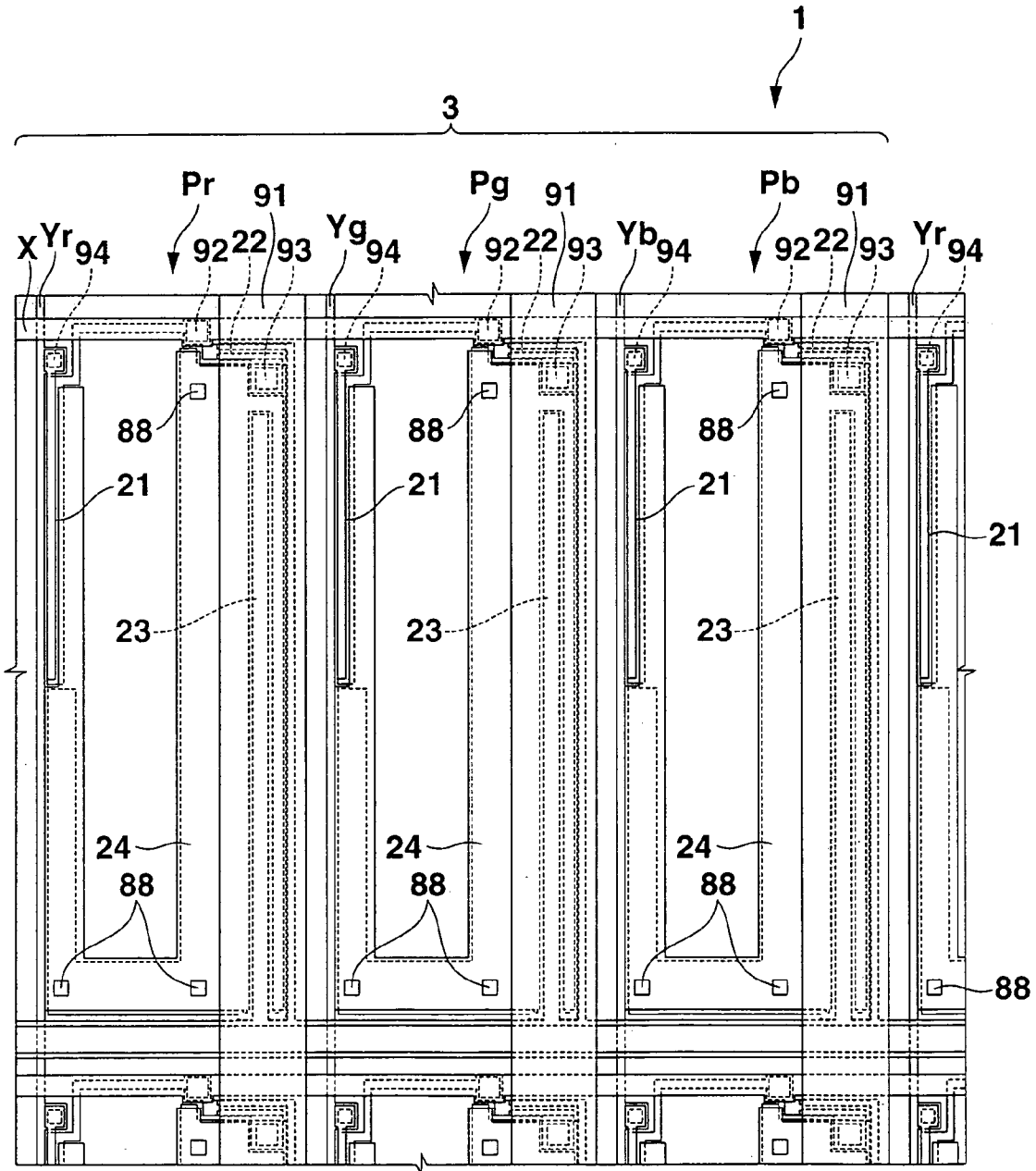


FIG.1

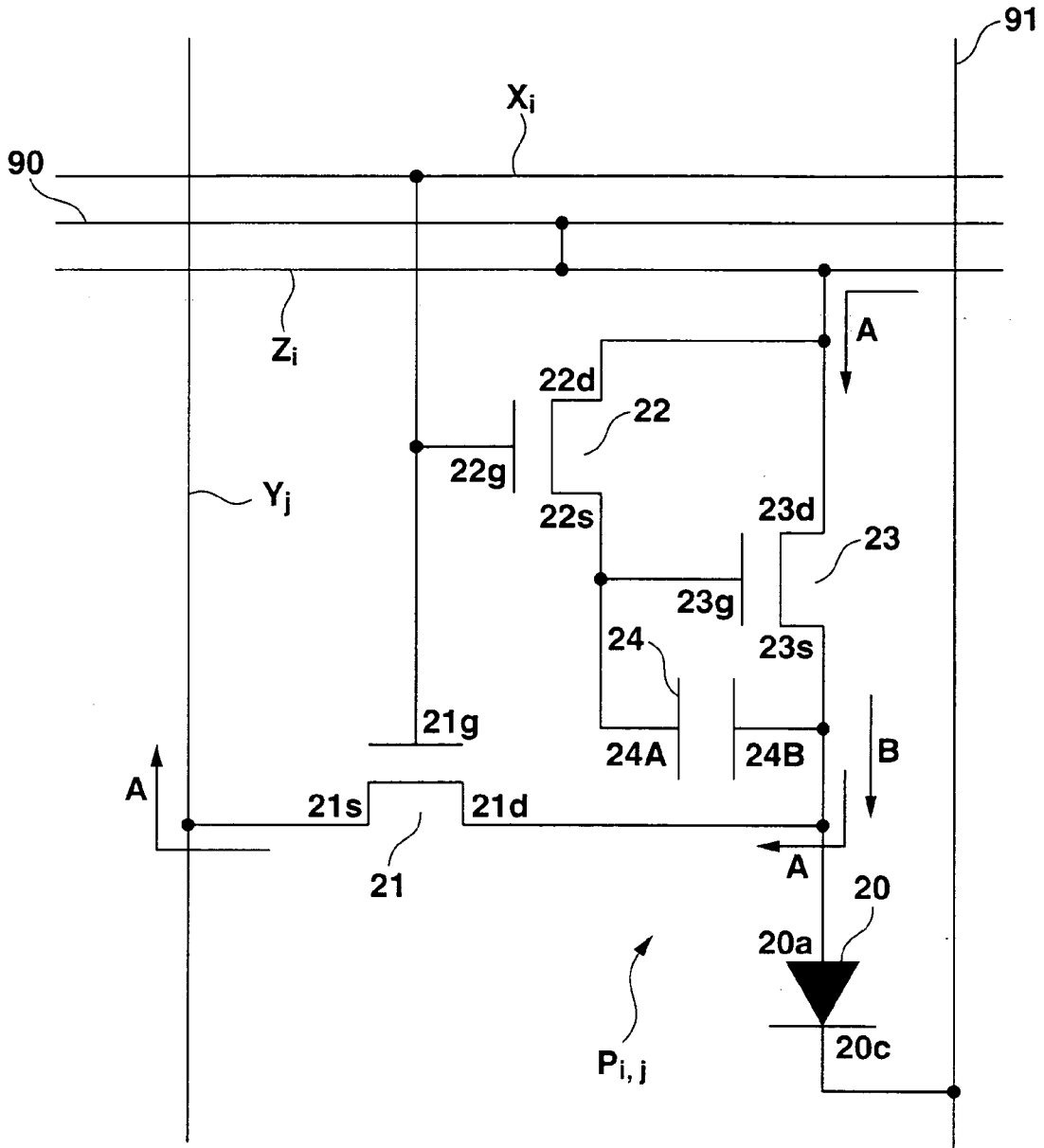


FIG.2

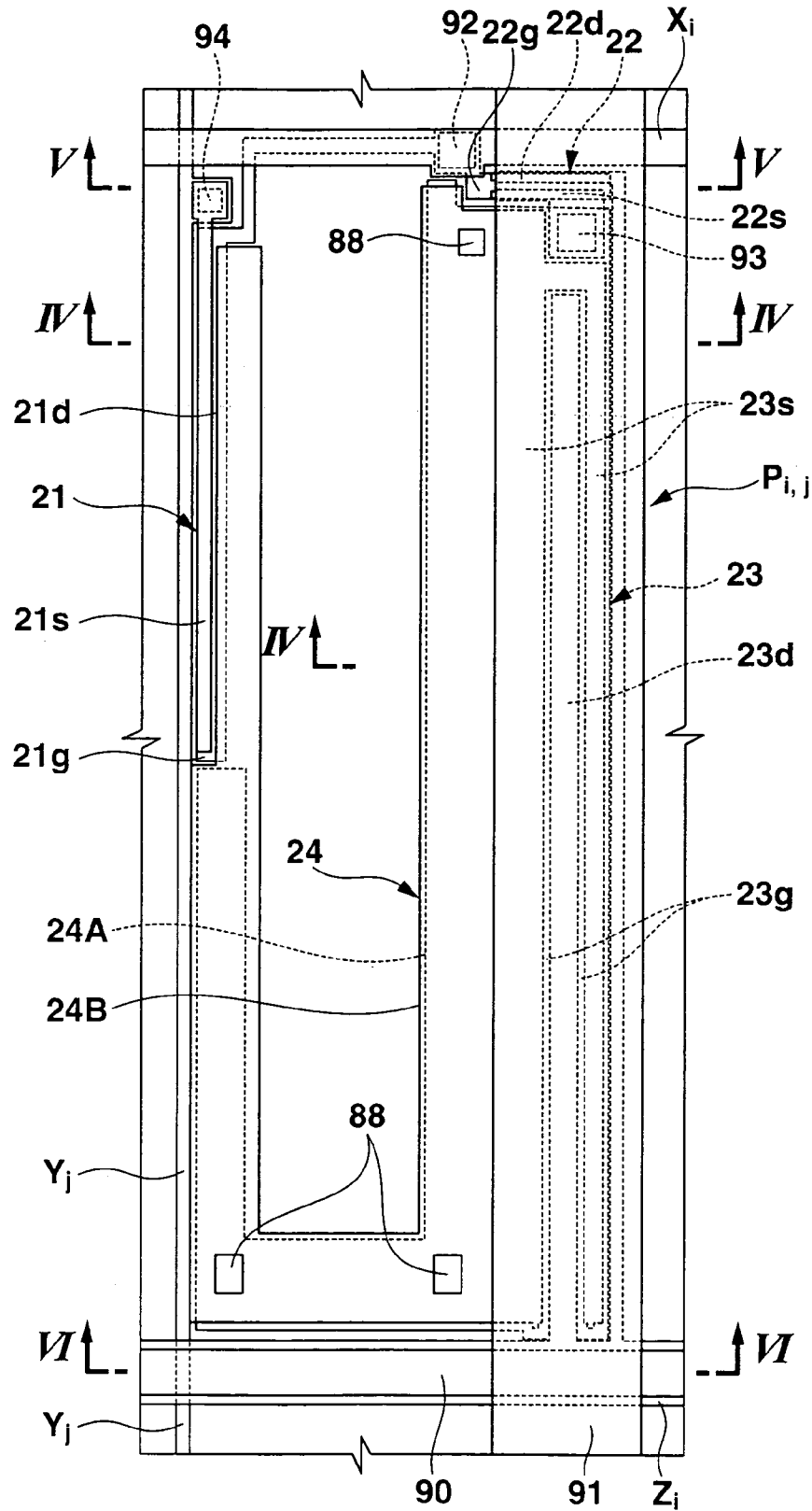


FIG. 3

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