



United States Patent [19]
Yamada et al.

[11] **Patent Number:** **6,072,450**
[45] **Date of Patent:** **Jun. 6, 2000**

- [54] **DISPLAY APPARATUS** 5,302,966 4/1994 Stewart 315/169.3
- 5,427,858 6/1995 Nakamura et al. 428/421
- [75] Inventors: **Hiroyasu Yamada, Hachioji; Tomoyuki Shirasaki, Higashiyamato; Yoshihiro Kawamura, Fussa, all of Japan** 5,640,067 6/1997 Yamauchi et al. 313/504
- 5,684,365 11/1997 Tang et al. 345/76
- 5,828,181 10/1998 Okuda 345/76
- 5,847,516 12/1998 Kishita et al. 315/169.3
- [73] Assignee: **Casio Computer Co., Ltd., Tokyo, Japan** 5,909,081 6/1999 Eida et al. 313/504

[21] Appl. No.: **08/976,217**

[22] Filed: **Nov. 21, 1997**

[30] **Foreign Application Priority Data**

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 Nov. 28, 1996 [JP] Japan 8-331389

[51] **Int. Cl.⁷** **H01L 27/12**

[52] **U.S. Cl.** **345/76; 345/36; 345/45; 313/500; 313/504; 315/169.3**

[58] **Field of Search** **345/36, 45, 76; 313/498-512; 315/169.3**

[56] **References Cited**

U.S. PATENT DOCUMENTS

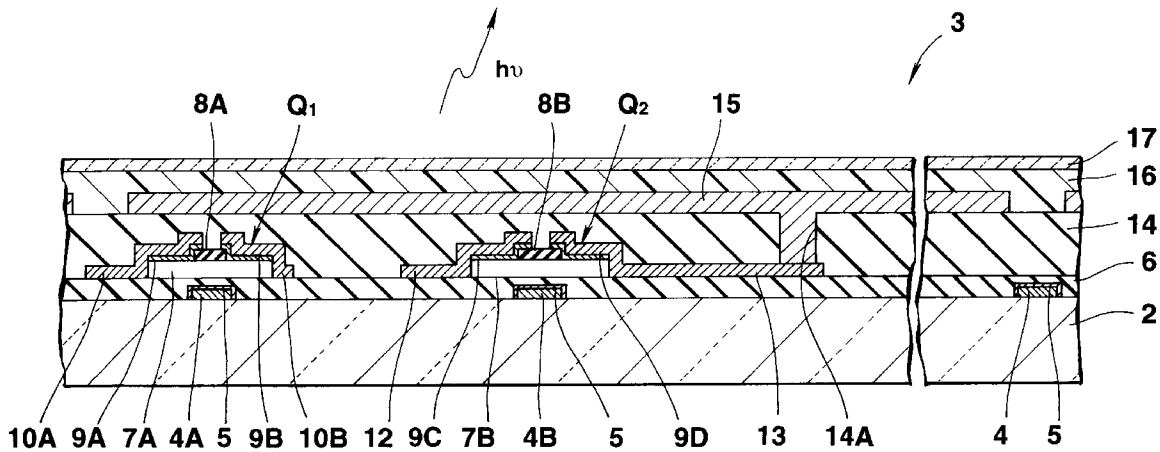
5,302,468 4/1994 Nimike et al. 313/500

Primary Examiner—Bipin Shalwala
Assistant Examiner—Vincent E. Kovalick
Attorney, Agent, or Firm—Frishauf, Holtz, Goodman, Langer & Chick, P.C.

[57] **ABSTRACT**

Selection transistors and drive transistors are formed in individual pixel areas on a substrate. Cathode electrodes which reflect visible light are formed above the selection transistors and the drive transistors so as to cover the pixel areas, with flat insulation films between the cathode electrodes and the selection and drive transistors. An organic EL layer and an anode electrode are sequentially formed on the cathode electrodes.

18 Claims, 21 Drawing Sheets



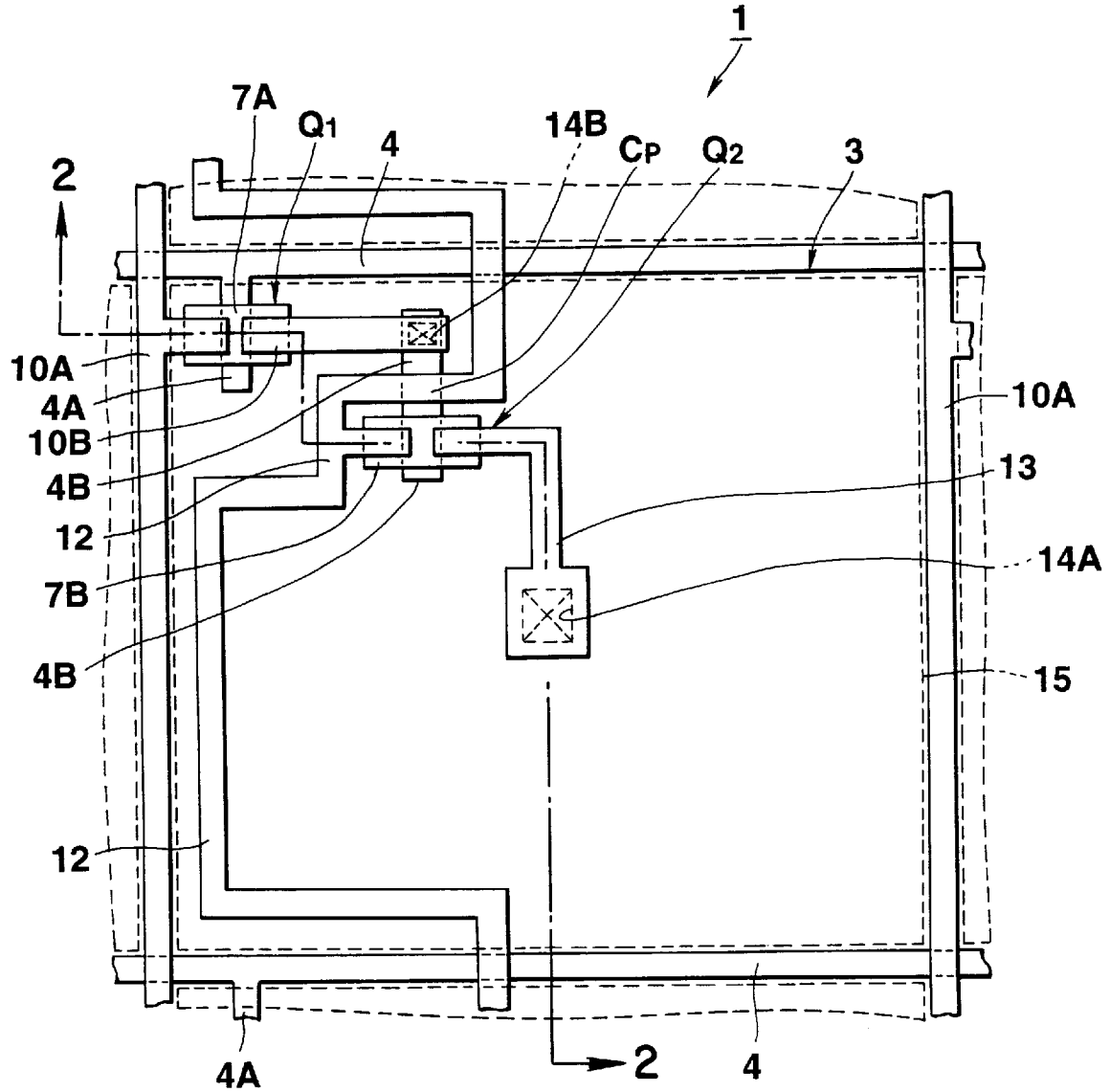


FIG.1

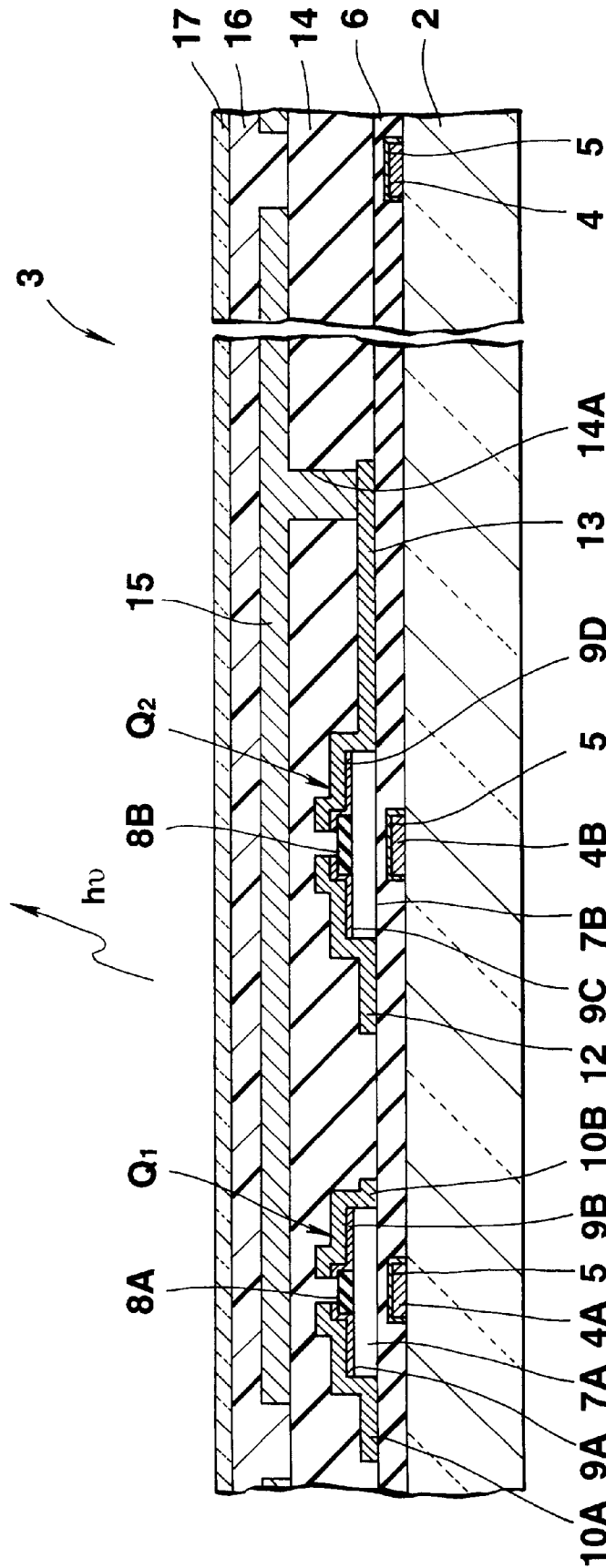


FIG.2

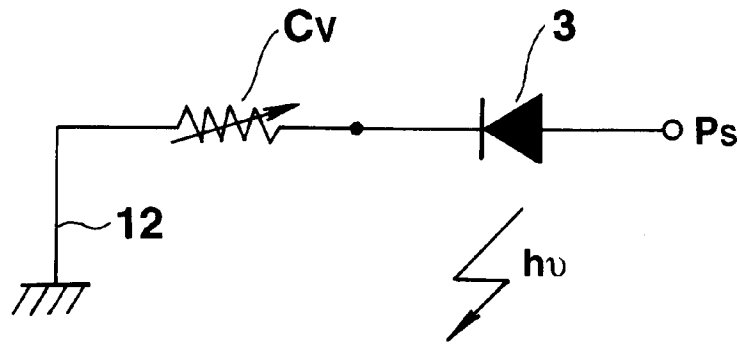


FIG.3

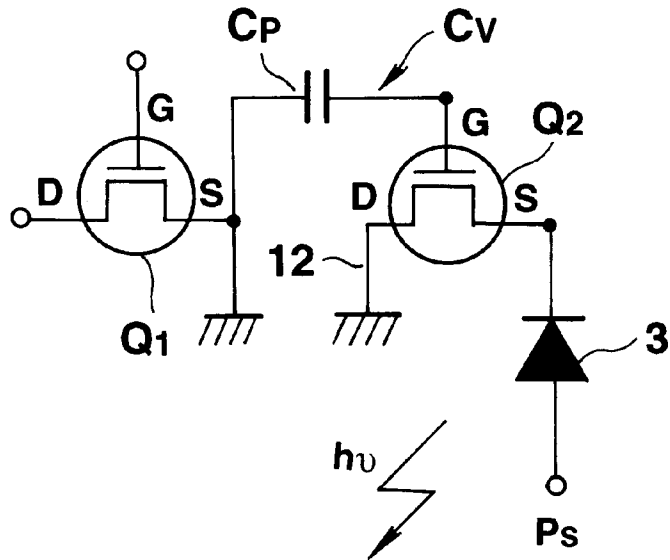


FIG.4

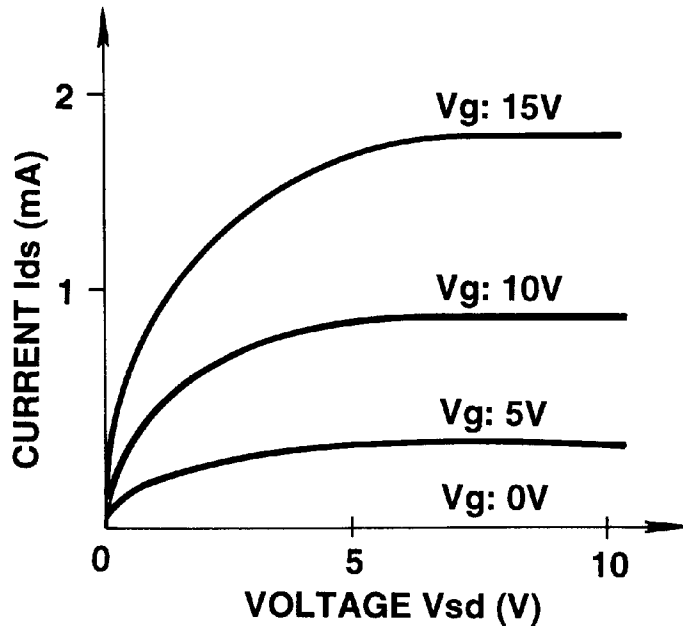


FIG.5

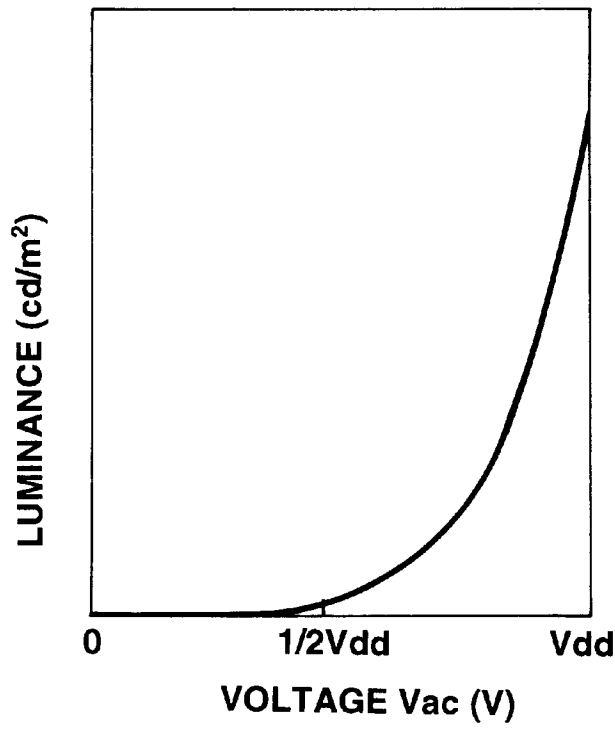


FIG.6

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