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# United States Patent [19]

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Shimada et al.

[45] Date of Patent: **Jun. 27, 2000**

[54] ACTIVE MATRIX DISPLAY DEVICE AND ITS DRIVING METHOD

5,253,091 10/1993 Kimura et al. .... 345/87

### FOREIGN PATENT DOCUMENTS

[75] Inventors: Takayuki Shimada, Nara-ken; Toshihiro Yamashita; Yutaka Takafuji, both of Nara, all of Japan

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2 146 478 4/1985 United Kingdom .

[73] Assignee: Sharp Kabushiki Kaisha, Osaka, Japan

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[21] Appl. No.: 08/266,159

Patent Abstracts of Japan, vol. 14, No. 580 (E-1017) Dec. 25, 1990 & JP-A-02 252 378 (SONY) Oct. 11, 1990 (pp. 501-507).

[22] Filed: Jun. 27, 1994

Japan Display '89, Emoto et al: 0.92 in. Active-Matrix LCD With Fully Integrated Poly-Si TFT Drivers of New Circuit Configuration, pp. 152-154.

### Related U.S. Application Data

[63] Continuation of application No. 08/009,115, Jan. 26, 1993, abandoned.

Primary Examiner—Regina Liang  
Attorney, Agent, or Firm—Nixon & Vanderhye, P.C.

### Foreign Application Priority Data

Jan. 31, 1992 [JP] Japan ..... 4-016266

### [57] ABSTRACT

[51] Int. Cl.<sup>7</sup> ..... G09G 3/36

To enhance the display quality by improving the writing characteristic of active matrix display device.

[52] U.S. Cl. .... 345/94; 345/208

[58] Field of Search ..... 345/100, 89, 90, 345/94, 95, 208, 99, 204, 87; 359/54

A plurality of signal lines of video signals are provided for pixels of each column arranged in two-dimensional array, and the driving element of each pixel is designed to be driven by any one of the signal lines, so that the scanning time of each line may be extended longer than one horizontal scanning period.

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13 Claims, 8 Drawing Sheets

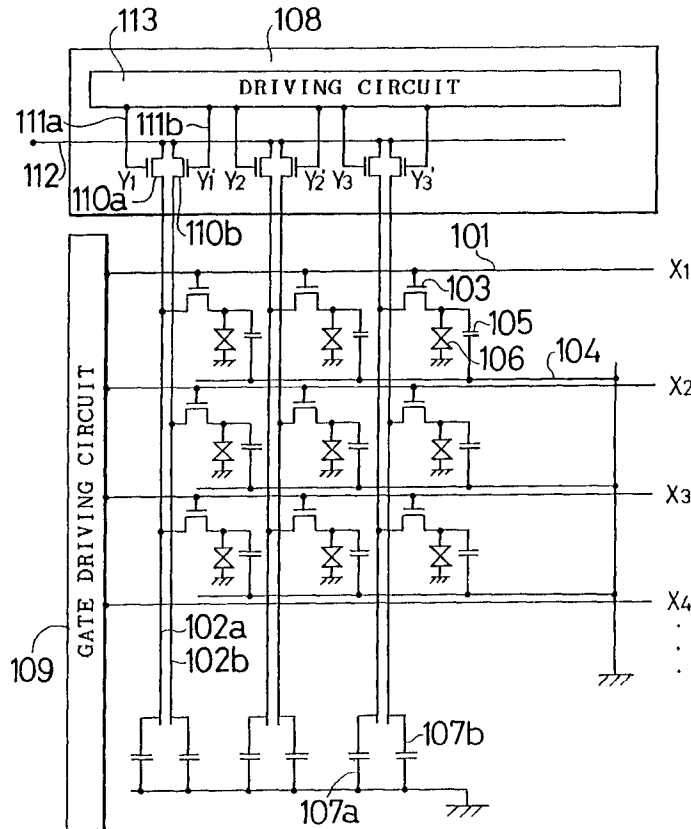


Fig. 1 (Prior Art)

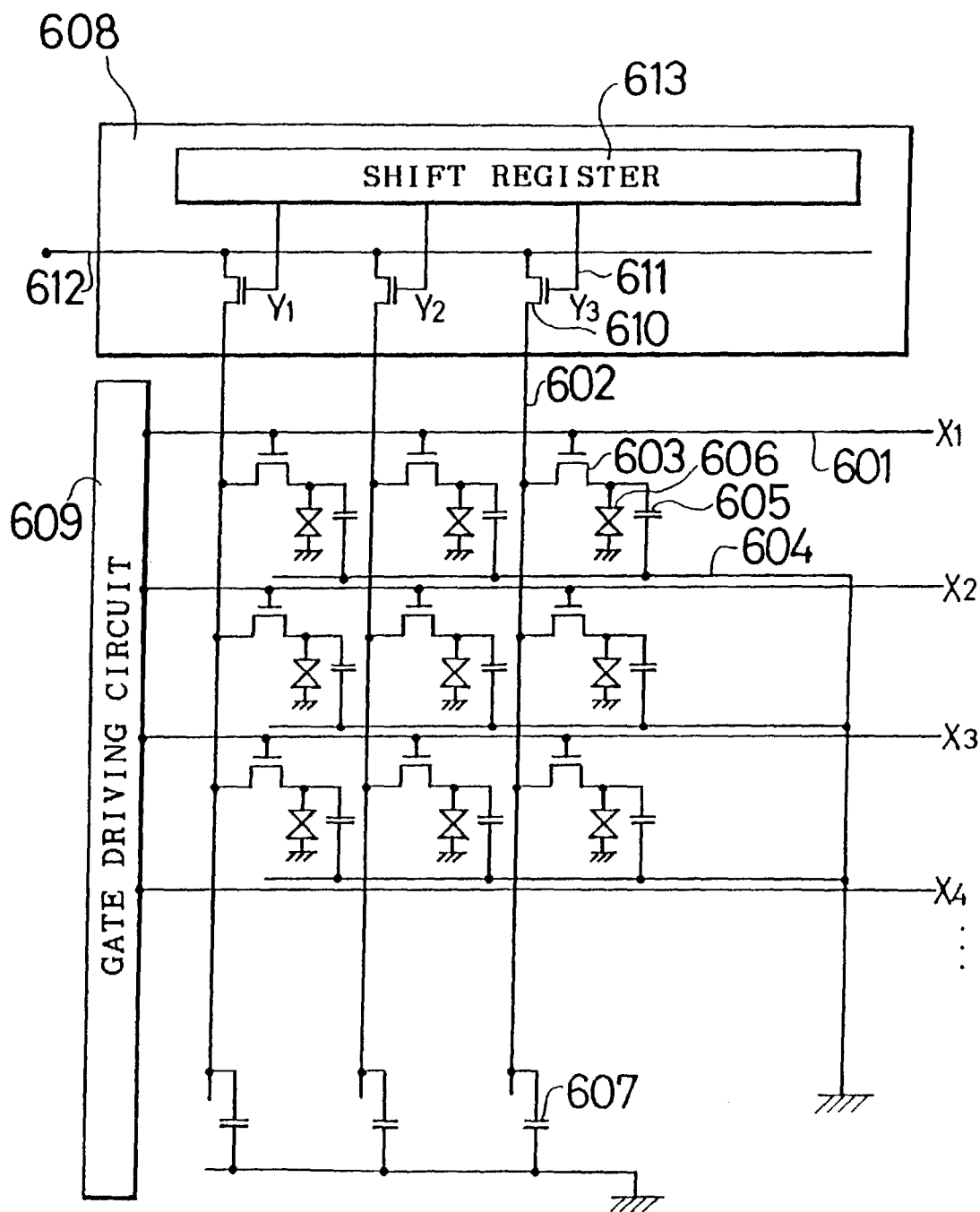


Fig. 2 (Prior Art)

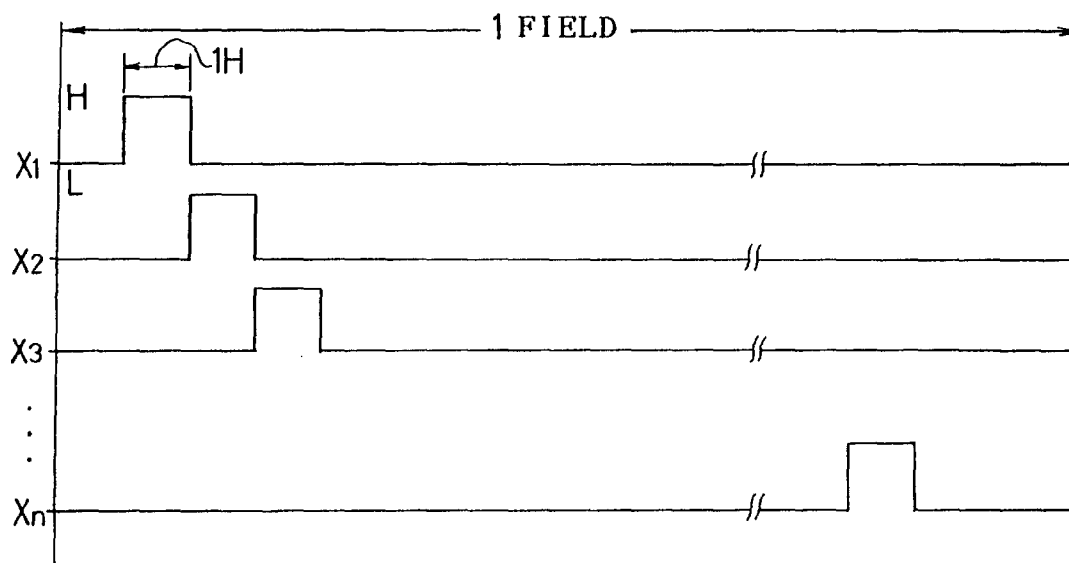


Fig. 3 (Prior Art)

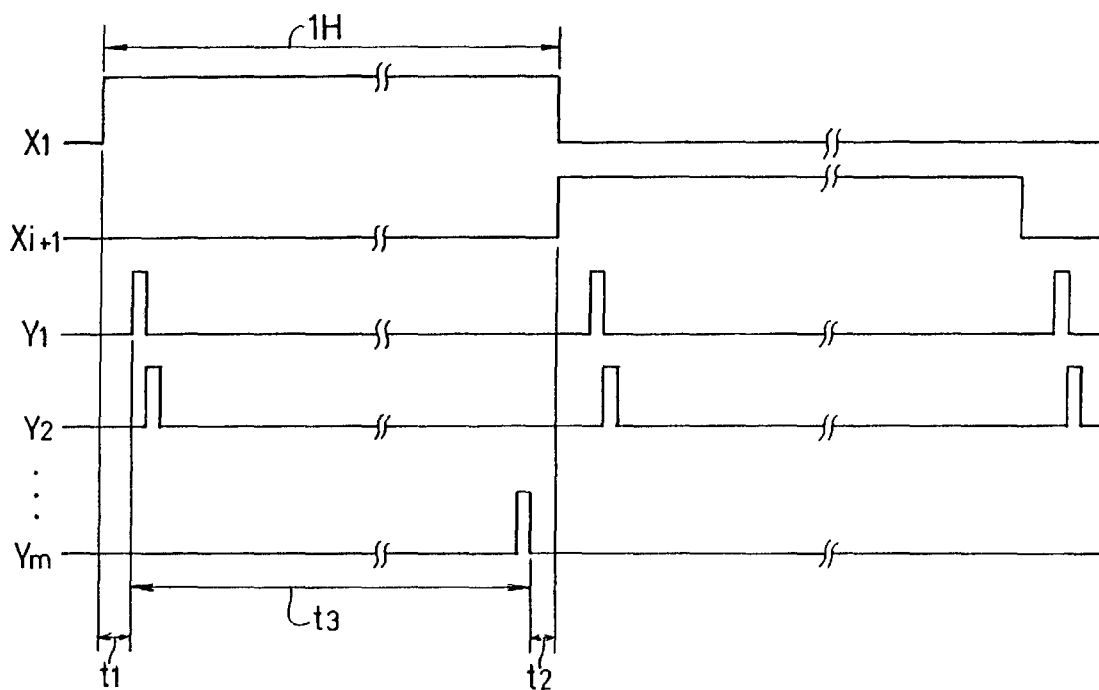
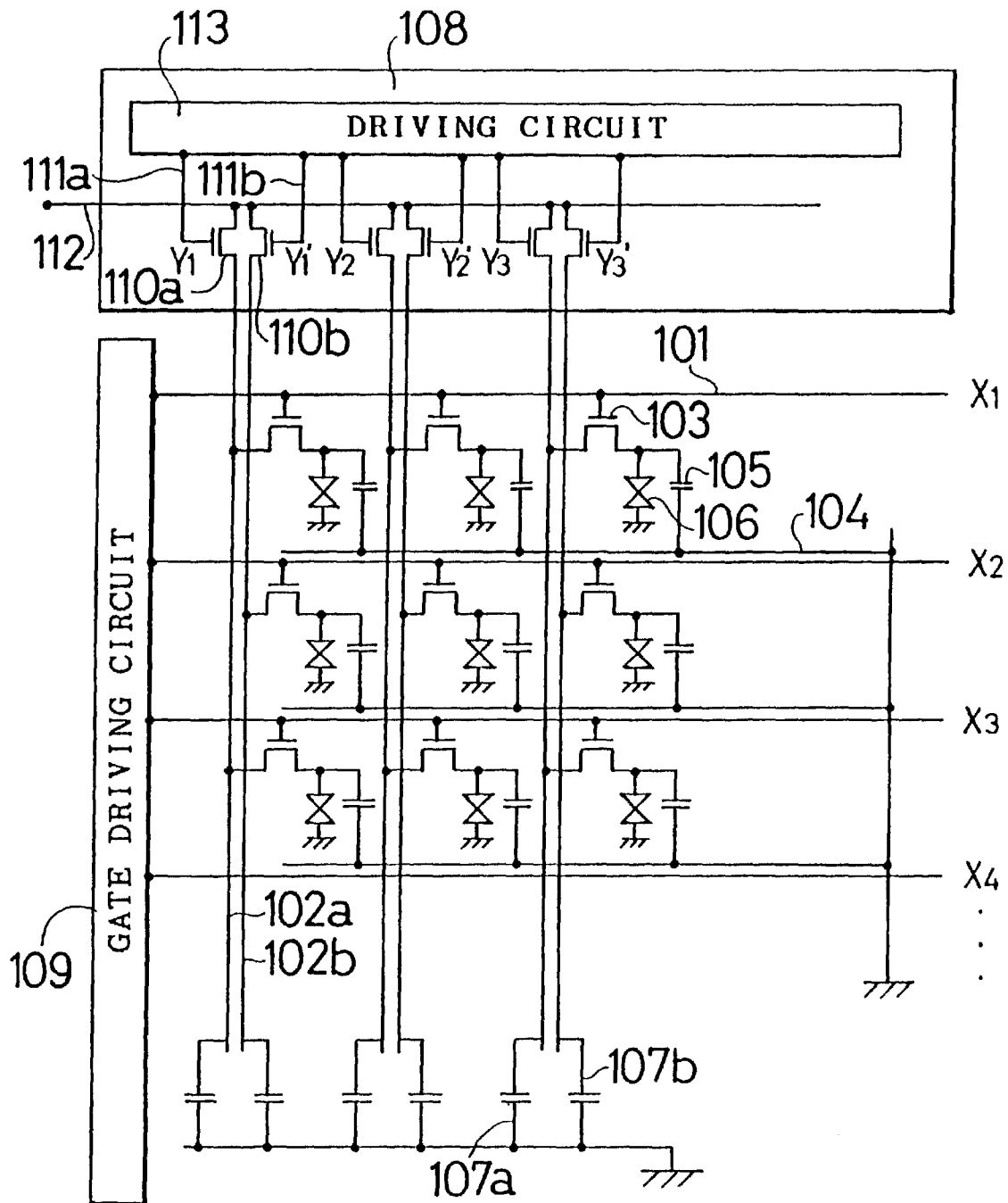


Fig. 4



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