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(12) **United States Patent**  
**Childs et al.**

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(54) **ACTIVE MATRIX DISPLAY DEVICES, AND THEIR MANUFACTURE**

(58) **Field of Classification Search** ..... 438/59, 438/72, 34; 257/59, 72, 88, E25.005, E27.133; 313/34

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See application file for complete search history.

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(73) Assignee: **Koninklijke Philips Electronics N.V.**, Eindhoven (NL)

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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 226 days.

(Continued)

This patent is subject to a terminal disclaimer.

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Primary Examiner—Quoc Hoang

(86) PCT No.: **PCT/IB03/00699**

(74) Attorney, Agent, or Firm—Paul Im

§ 371 (c)(1),  
(2), (4) Date: **Sep. 15, 2004**

(57) **ABSTRACT**

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Physical barriers (210) are present between neighboring pixels (200) on a circuit substrate (100) of an active-matrix display device, such as an electroluminescent display formed with LEDs (25) of organic semiconductor materials. The invention forms at least parts of the barriers (210) with metal or other electrically-conductive material (240) that is insulated (40) from the LEDs but connected to the circuitry (4, 5, 6, 9, 140, 150, 160, T1, T2, Tm, Tg, Ch etc.) within the substrate (100). This conductive barrier material (240) may back up or replace, for example, matrix addressing lines (150) and/or form an additional component either within the pixel array or outside. The additional component comprising the conductive barrier material (240) is advantageously a capacitor (Ch), or an inductor (L) or transformer (W), or even an aerial.

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(65) **Prior Publication Data**

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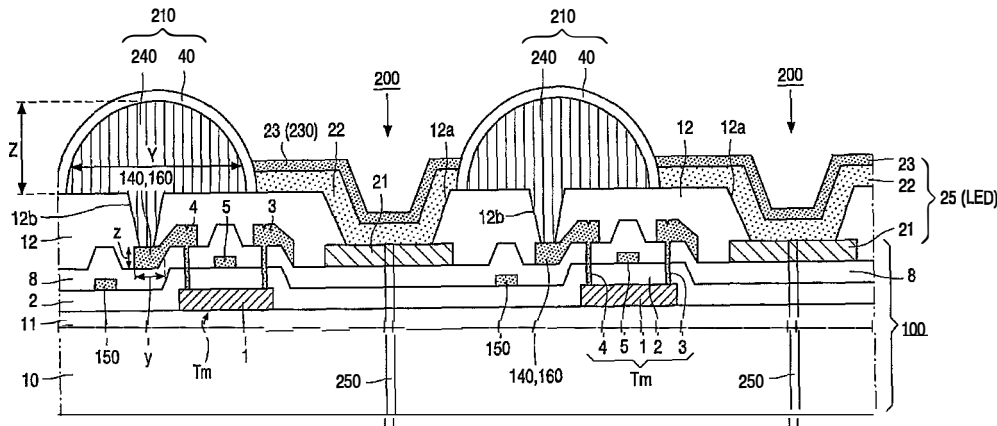
(30) **Foreign Application Priority Data**

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Jul. 11, 2002 (GB) ..... 0216057.0

(51) **Int. Cl.**  
**H01L 29/04** (2006.01)

(52) **U.S. Cl.** ..... **257/59; 257/72; 257/E25.005; 257/E27.133**

**13 Claims, 11 Drawing Sheets**



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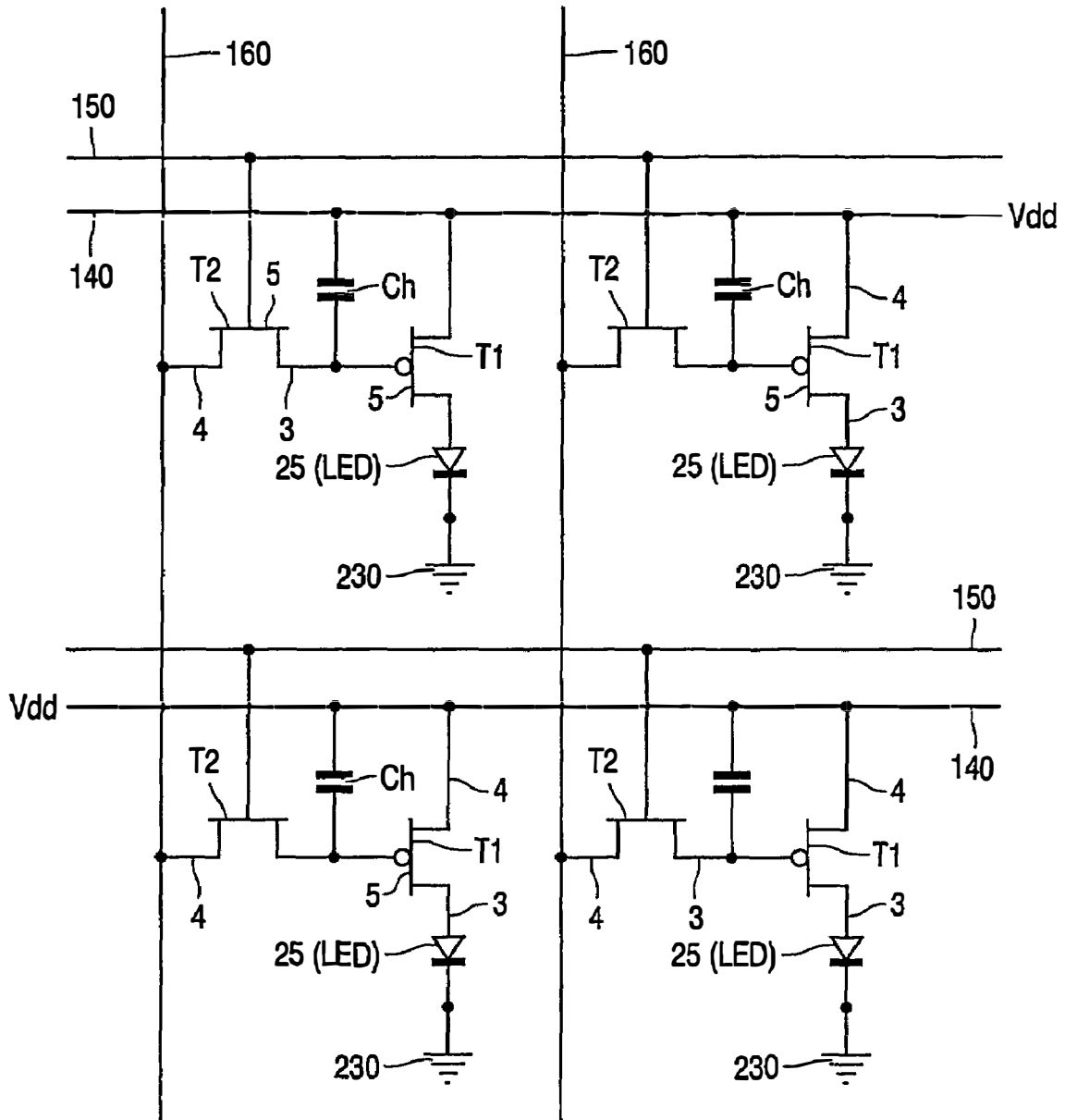


FIG. 1

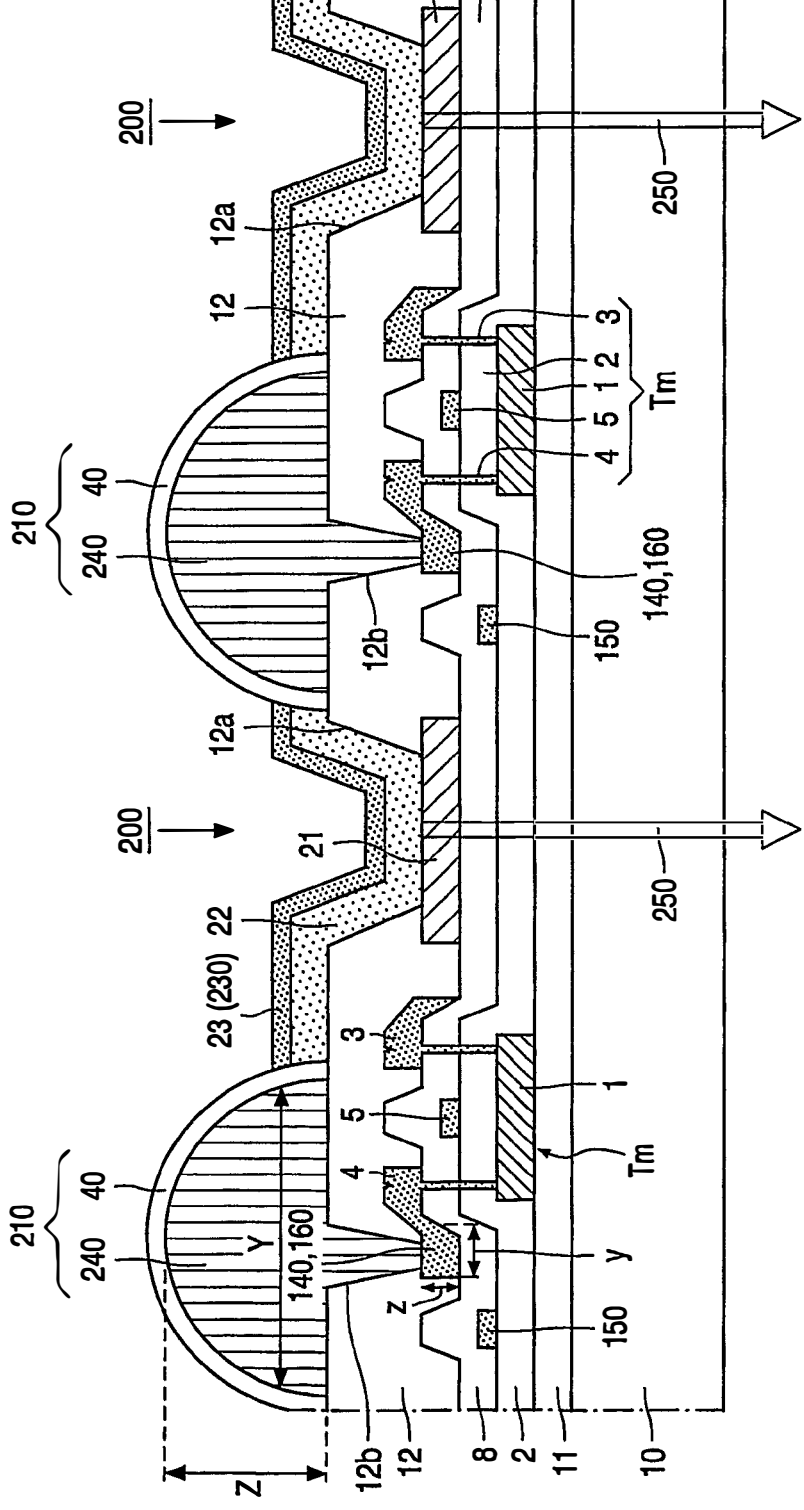


FIG. 2

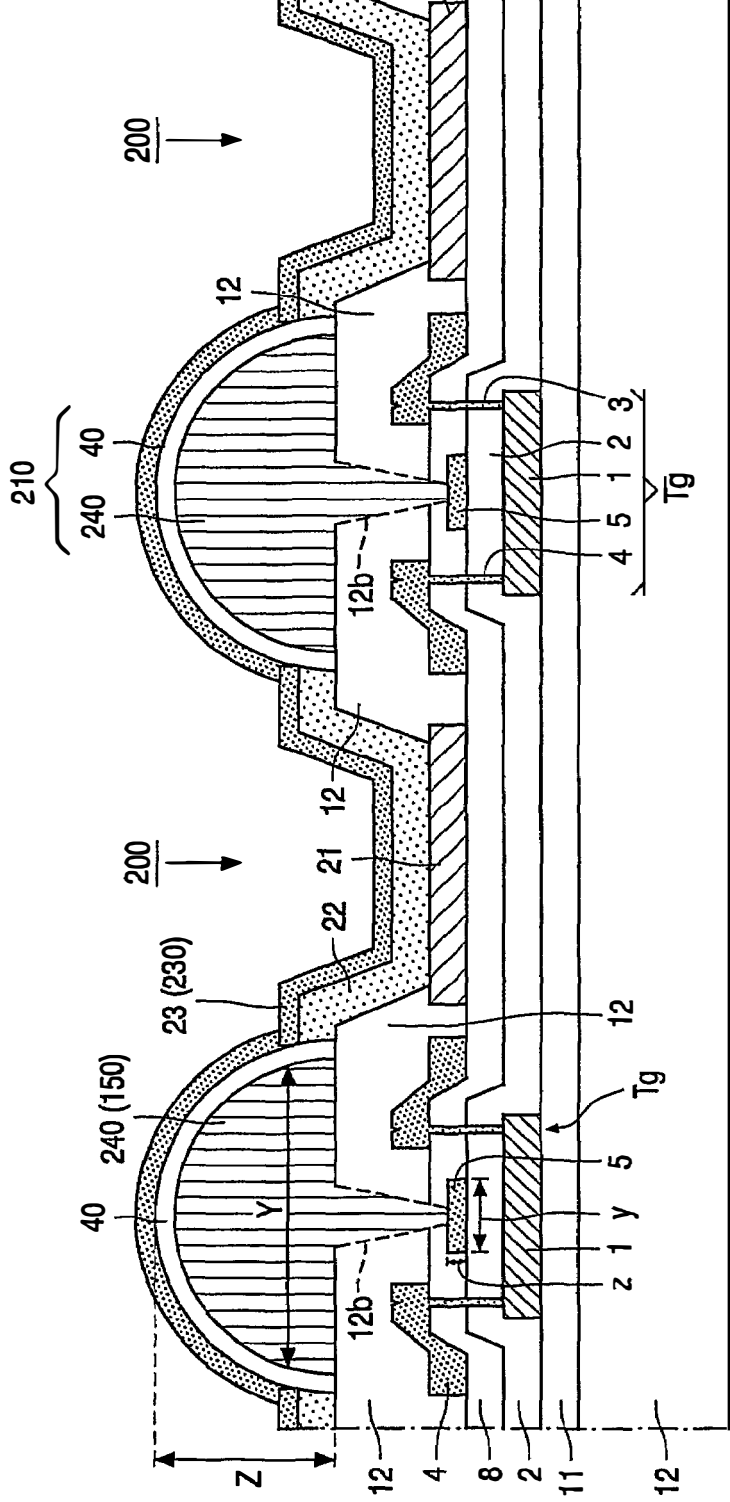


FIG. 3

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