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

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(54) **ELECTROPHORETIC DISPLAY DEVICE**

(56) **References Cited**

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**Jeff Mabeck**, Corvallis, OR (US)

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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 0 days.

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*Assistant Examiner* — James Jones

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§ 371 (c)(1),  
(2), (4) Date: **Jul. 29, 2010**

(57) **ABSTRACT**

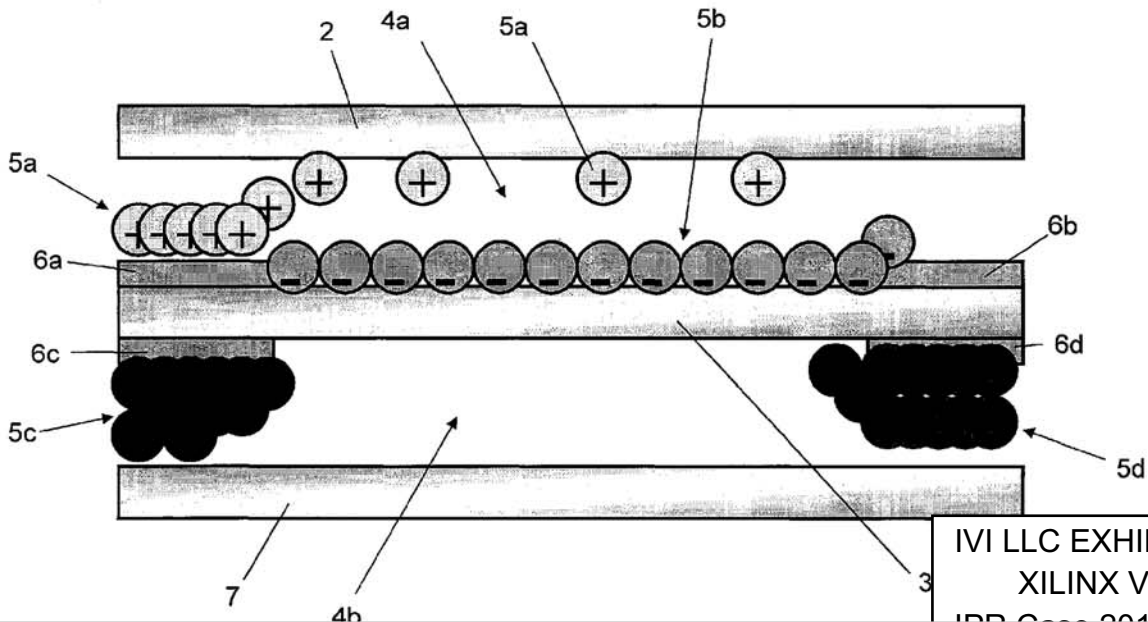
A multi-stable electrophoretic display device has a plurality of pixels and comprises a first substrate and a second substrate. The substrates are spaced apart from each other and enclose a layer of an electrophoretic medium comprising a liquid crystal material having finely divided pigment particles dispersed therein. The device further comprises electrodes for formation of a pixel area outline and applying an electric field across at least some of the electrophoretic medium in the pixel area. The electrodes occupy substantially less than the entire field of view of the display pixels and can be used to effect switching between a first optical state in which most incident light on a pixel does not impinge on a pigment particle, and a second optical state in which most incident light on a pixel impinges on pigment particles.

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PCT Pub. Date: **Sep. 3, 2009**

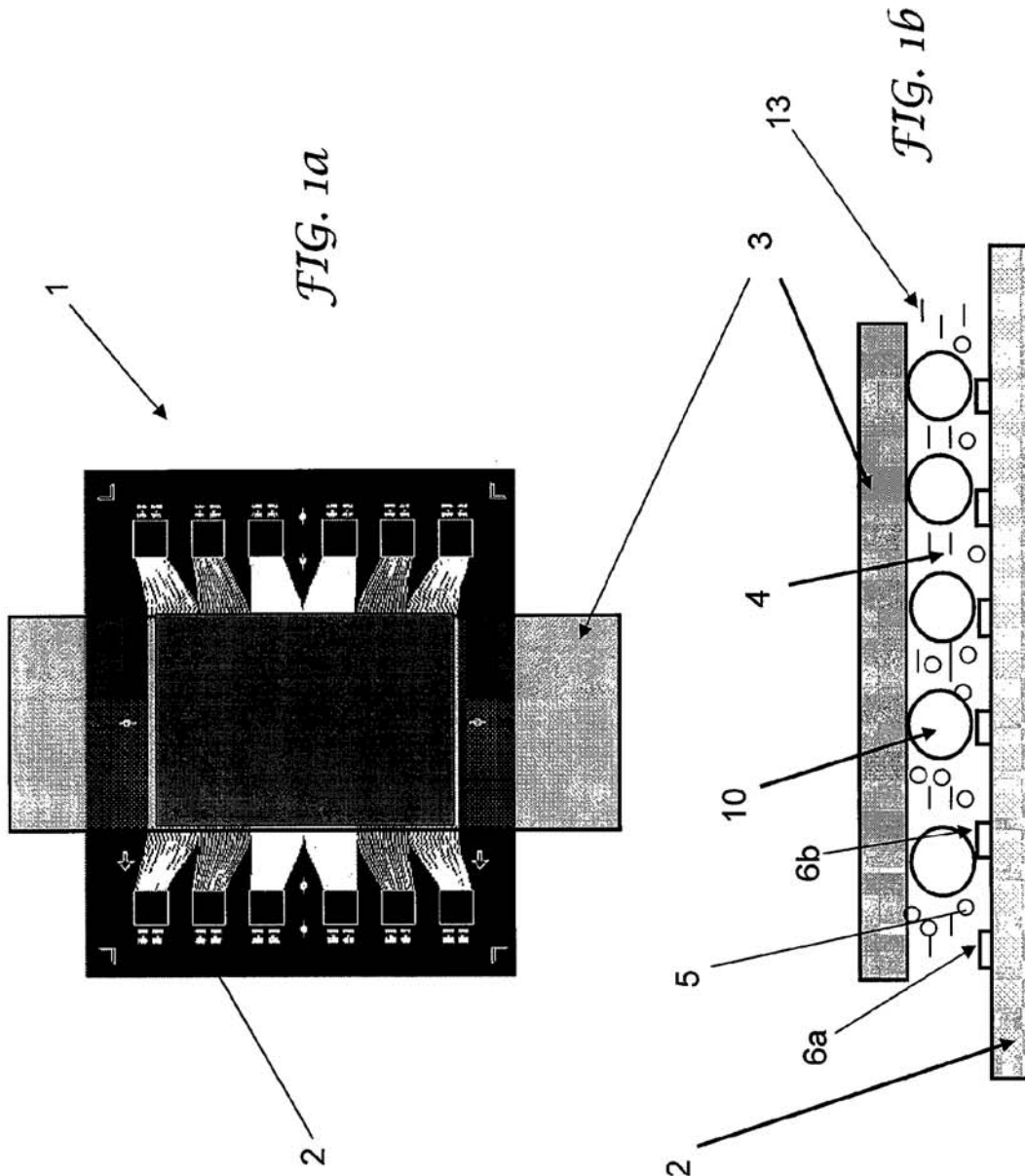
(65) **Prior Publication Data**  
US 2010/0328758 A1 Dec. 30, 2010

**22 Claims, 11 Drawing Sheets**

(51) **Int. Cl.**  
**G02B 26/00** (2006.01)  
(52) **U.S. Cl.** ..... **359/296; 359/295**  
(58) **Field of Classification Search** ..... **359/296**  
See application file for complete search history.



IVI LLC EXHIBIT 2010  
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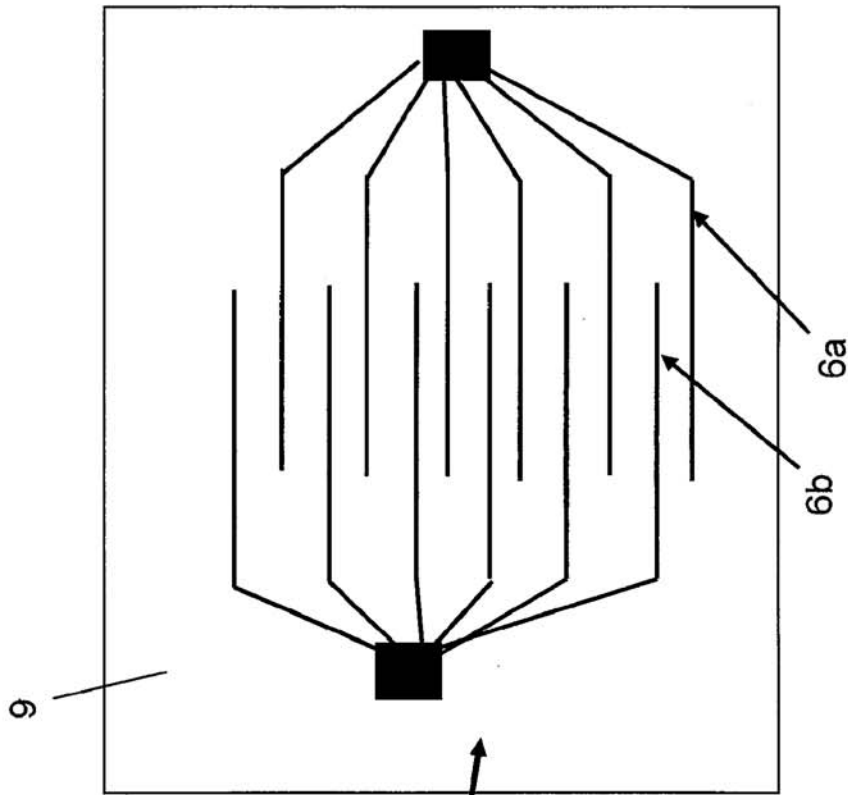


FIG. 2b

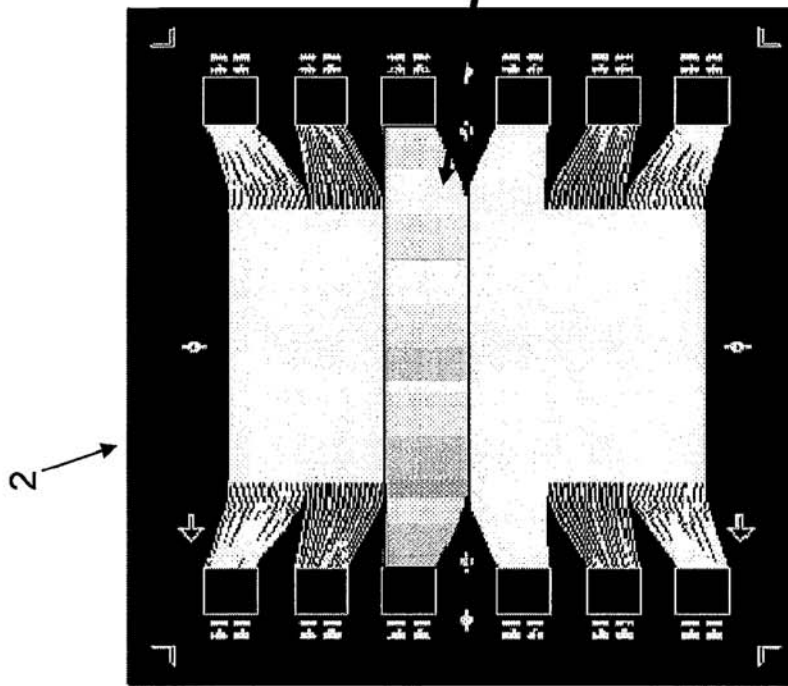


FIG. 2a

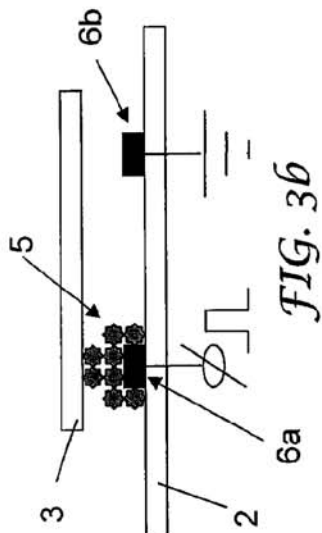


FIG. 3a

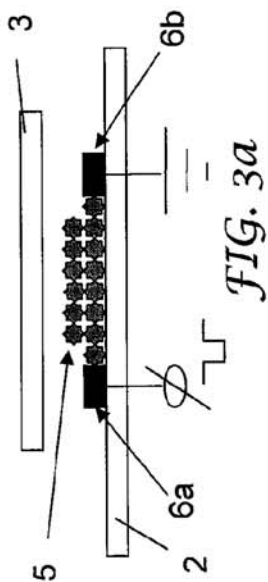


FIG. 3b

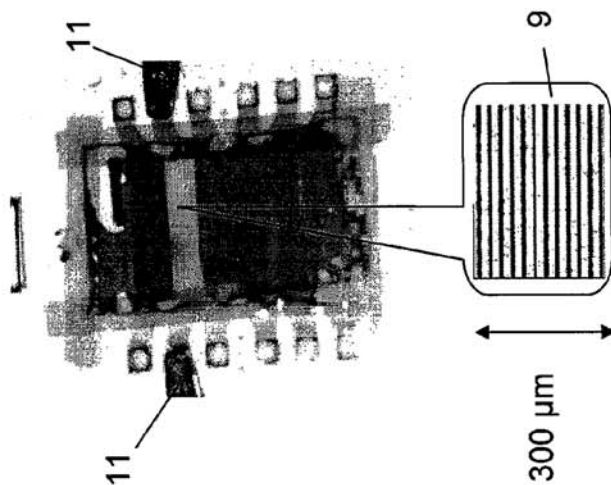


FIG. 4a

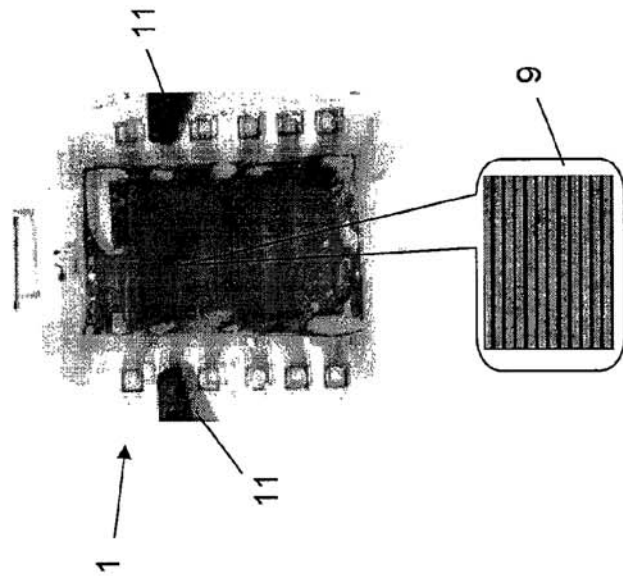


FIG. 4b

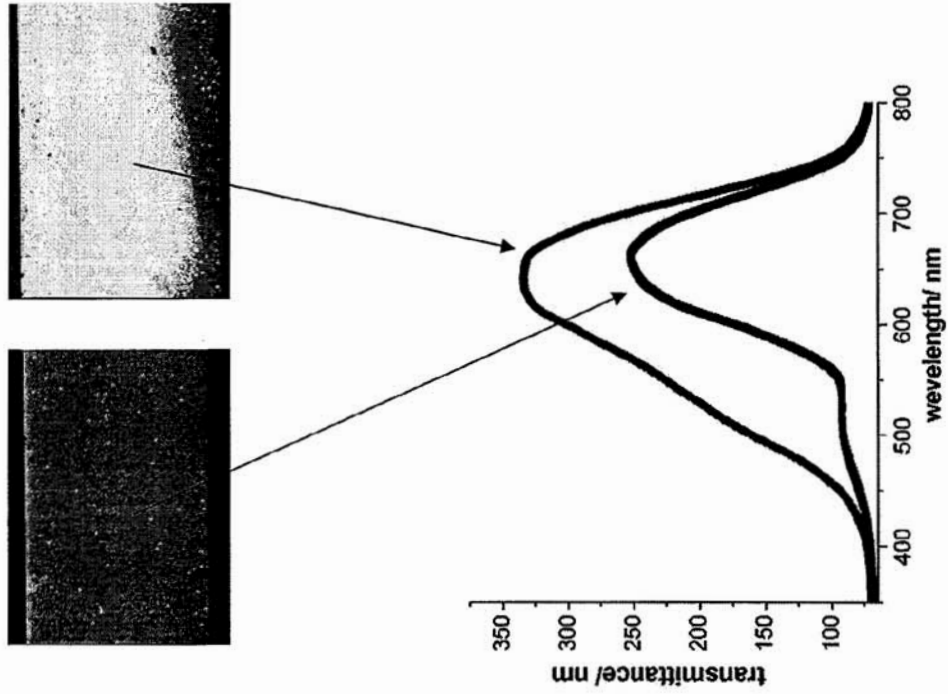


FIG. 5b

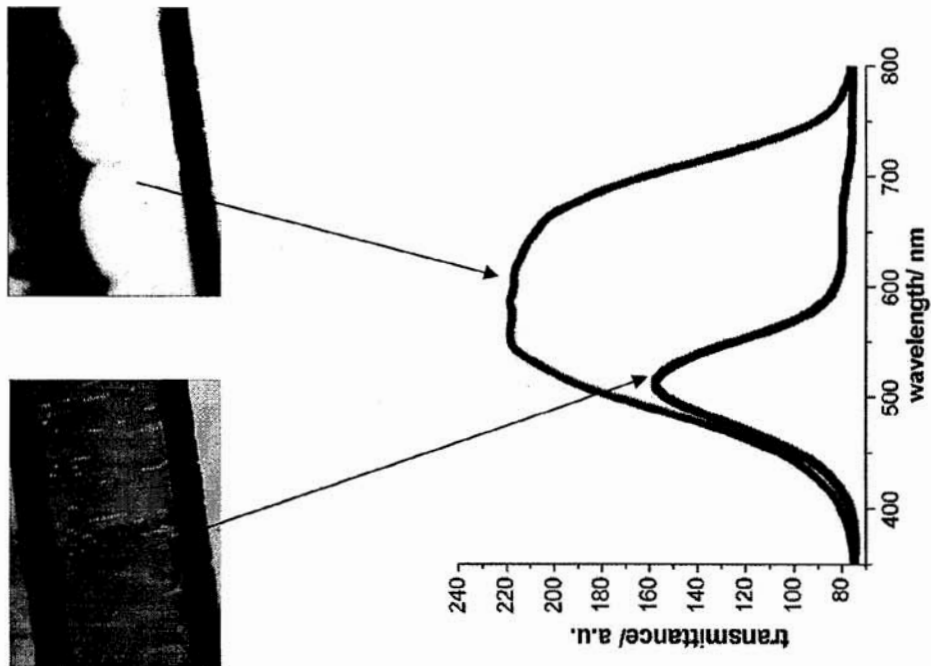


FIG. 5a

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