



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

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(54) **LIQUID CRYSTAL DISPLAY WHEREIN EACH PIXELS OF FIRST LAYER IS OPTICALLY ALIGNED WITH RESPECTIVE GROUP OF PIXELS OF SECOND LAYER**

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(\* ) Notice: Under 35 U.S.C. 154(b), the term of this patent shall be extended for 0 days.

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(30) **Foreign Application Priority Data**

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(51) **Int. Cl.<sup>7</sup>** ..... **G02F 1/1347**; G02F 1/1333; G02F 1/1335

(52) **U.S. Cl.** ..... **349/74**; 349/75; 349/78; 349/86; 349/117

(58) **Field of Search** ..... 349/74, 86, 117, 349/77, 75, 78

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*Primary Examiner*—William L. Sikes

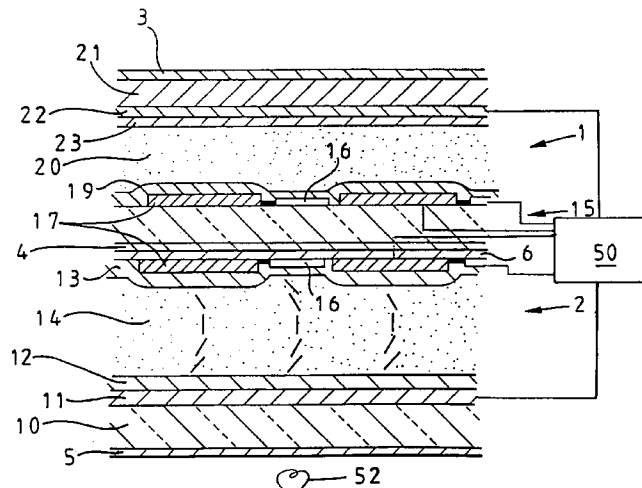
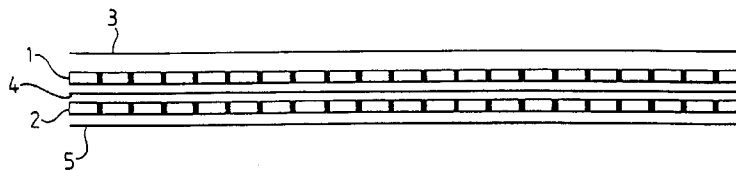
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(57) **ABSTRACT**

A color display includes a first layer of pixels, each of which has an independently controllable light attenuation so as to control the display intensity of each display pixel independently. A second layer of pixels is provided in which the color of each pixel can be independently controlled. Thus, each effective display pixel can be controlled, independently of the other pixels, with respect to its intensity and chrominance.

**31 Claims, 13 Drawing Sheets**



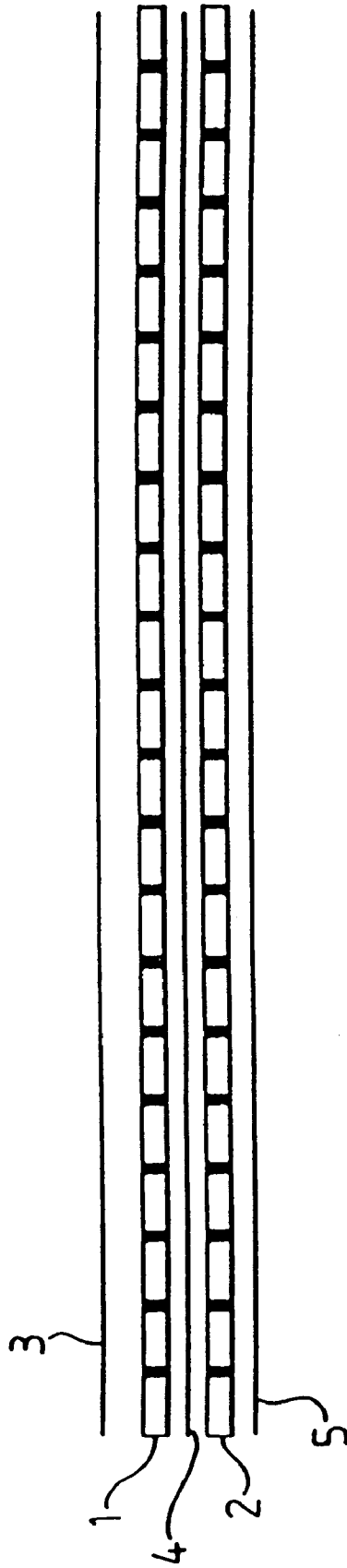


FIG 1

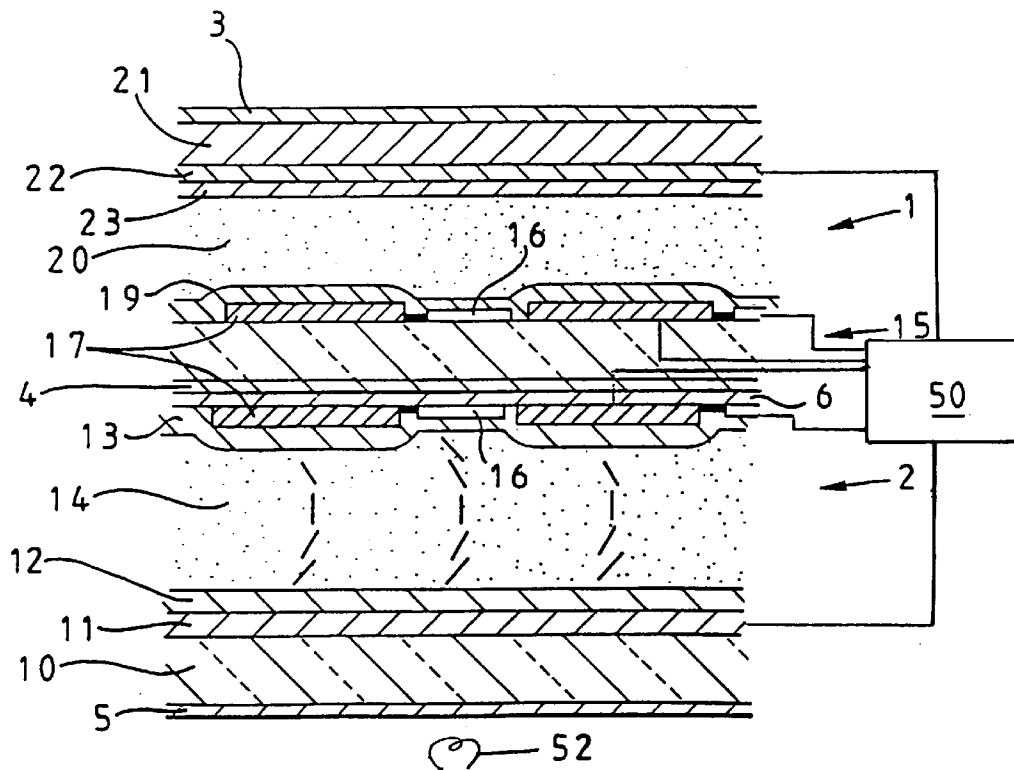


FIG 2a

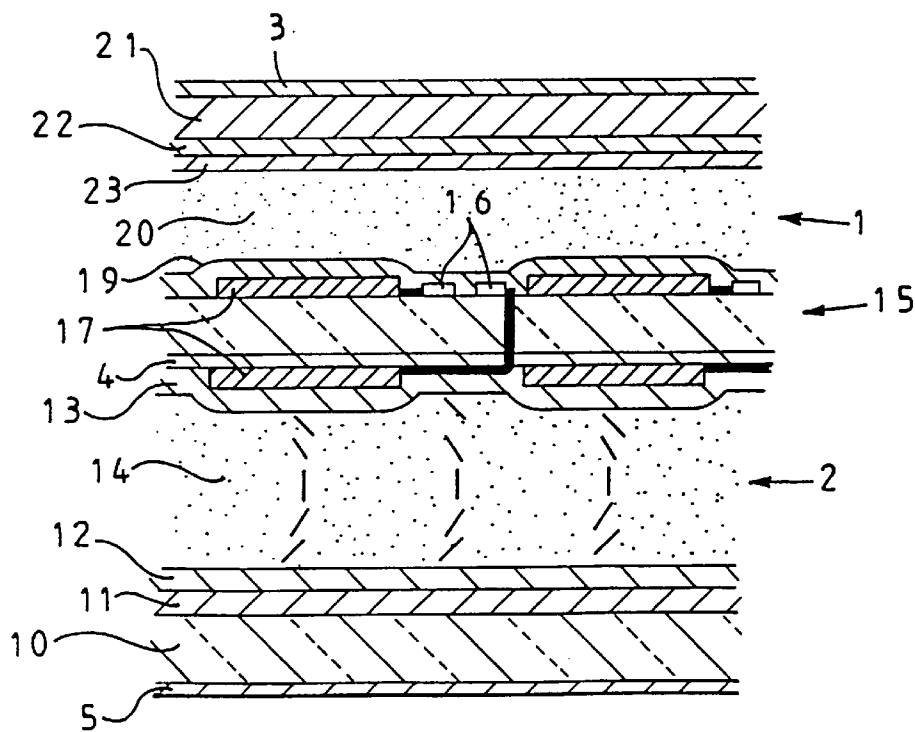


FIG 2b

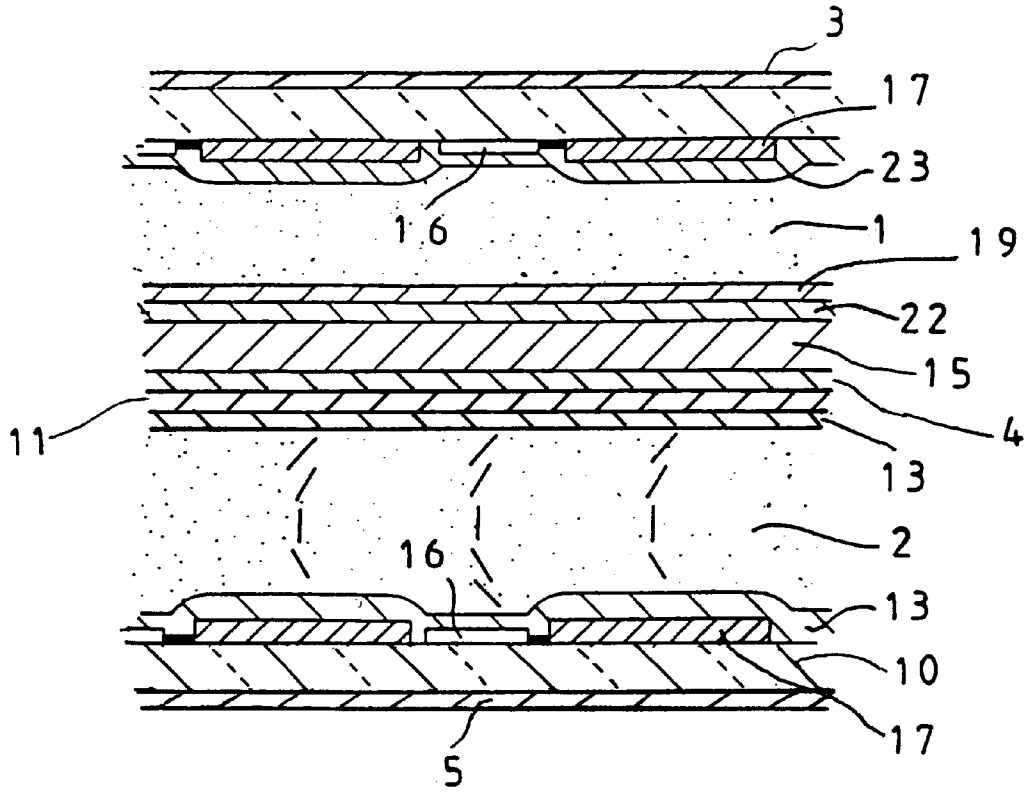


FIG 2c

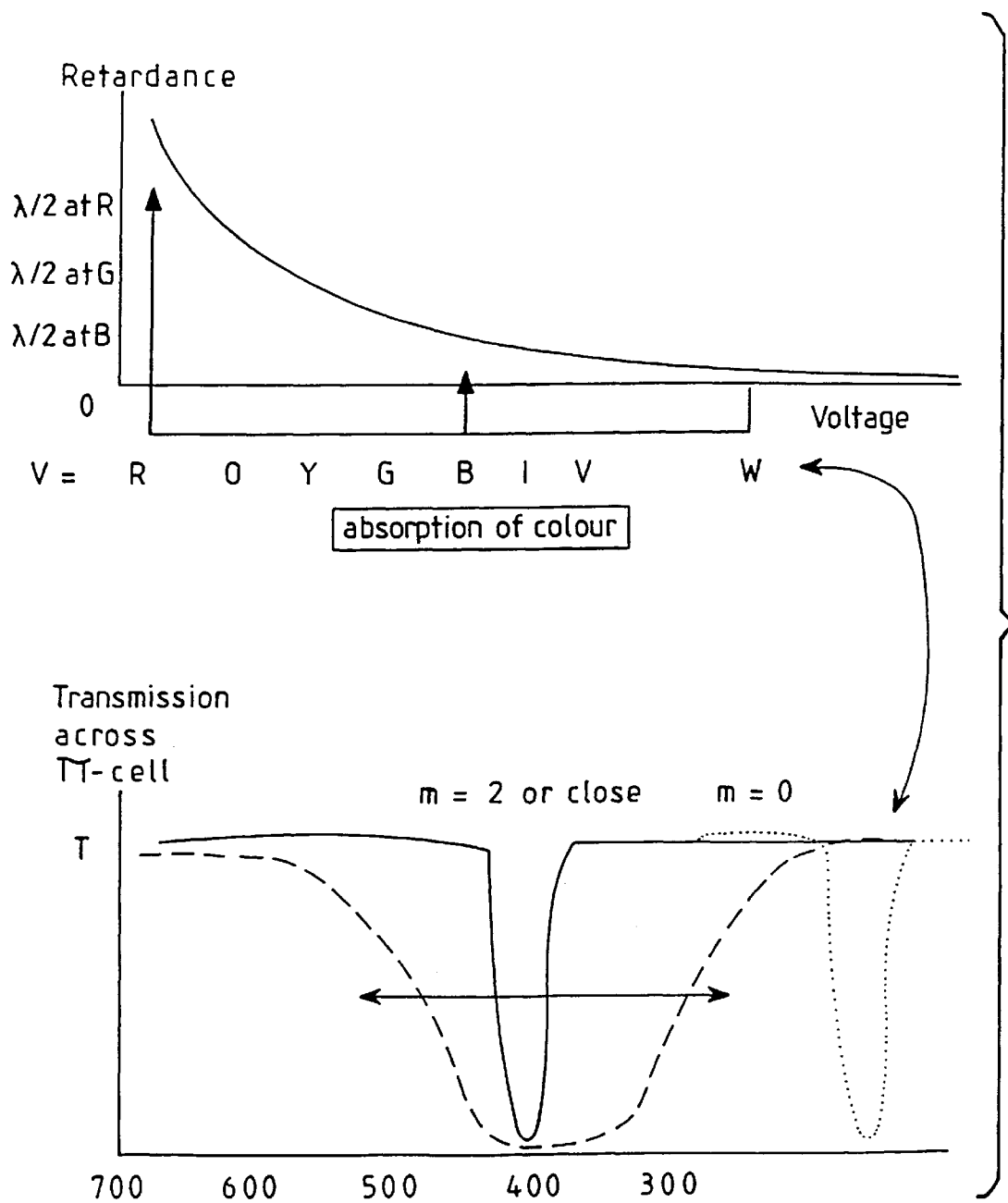


FIG 3

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