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(54) **Active matrix light modulators, use of an active matrix light modulator, and display**

(57) An active matrix light modulator, such as a thresholdless antiferroelectric active matrix liquid crystal display, comprises an active matrix of control elements 18 disposed at intersections of data lines 22 and scan lines 20, and an array 10 of pixels which are selectively addressable by data and scan signals applied to the control elements 18 by a data driver 12 and a scan driver 14. Such addressing is controlled so that a voltage is applied to each pixel during a corresponding addressing frame by the application of data and scan signals to an associated one of the control elements 18 in order to select the optical level of the pixel for each frame, and bipolar switching is applied to control the voltage applied to the pixel during successive subframes such that, when one optical level is selected for the frame, a positive voltage is applied to the pixel during one subframe of the frame and a negative voltage of equal magnitude but opposite polarity is applied to the pixel during another subframe of the frame and, when another optical level is selected for the frame, an intermediate voltage (preferably zero voltage) is applied to the pixel during both of the subframes of the frame, so as to provide DC balancing within the frame. The required grey level within each frame is accurately reproduced and is substantially independent of the previous state of the pixel. The use

of such modulators to reduce the effects of asymmetrical optical performance and colour-sequential displays are also disclosed.

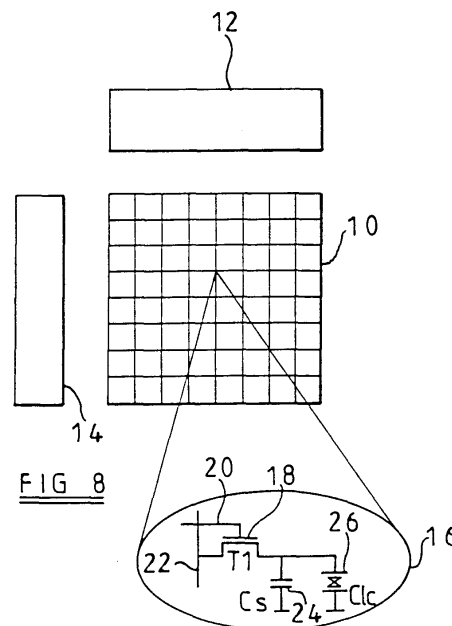
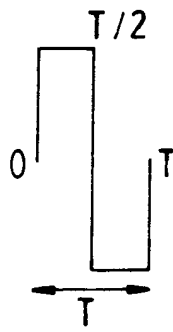


FIG 3a





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EUROPEAN SEARCH REPORT

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Y	* Abstract * * page 2, line 13 - page 3, line 8 * * page 4, line 57 - page 8, line 4; figures 1-6 * * page 8, line 44 - line 46 * * page 9, line 17 - line 43; figures 9,10 * * page 11, line 44 - page 12, line 1; figures 14A-15C * ---	7,8,13, 17-20, 31,32, 37,41-44	
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The present search report has been drawn up for all claims			
Place of search THE HAGUE		Date of completion of the search 15 December 1999	Examiner Corsi, F
CATEGORY OF CITED DOCUMENTS X : particularly relevant if taken alone Y : particularly relevant if combined with another document of the same category A : technological background O : non-written disclosure P : intermediate document		T : theory or principle underlying the invention E : earlier patent document, but published on, or after the filing date D : document cited in the application L : document cited for other reasons & : member of the same patent family, corresponding document	

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CLAIMS INCURRING FEES

The present European patent application comprised at the time of filing more than ten claims.

- Only part of the claims have been paid within the prescribed time limit. The present European search report has been drawn up for the first ten claims and for those claims for which claims fees have been paid, namely claim(s):
- No claims fees have been paid within the prescribed time limit. The present European search report has been drawn up for the first ten claims.

LACK OF UNITY OF INVENTION

The Search Division considers that the present European patent application does not comply with the requirements of unity of invention and relates to several inventions or groups of inventions, namely:

see sheet B

- All further search fees have been paid within the fixed time limit. The present European search report has been drawn up for all claims.
- As all searchable claims could be searched without effort justifying an additional fee, the Search Division did not invite payment of any additional fee.
- Only part of the further search fees have been paid within the fixed time limit. The present European search report has been drawn up for those parts of the European patent application which relate to the inventions in respect of which search fees have been paid, namely claims:
- None of the further search fees have been paid within the fixed time limit. The present European search report has been drawn up for those parts of the European patent application which relate to the invention first mentioned in the claims, namely claims:



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Application Number
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DOCUMENTS CONSIDERED TO BE RELEVANT			
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The present search report has been drawn up for all claims			TECHNICAL FIELDS SEARCHED (Int.Cl.6)
Place of search THE HAGUE		Date of completion of the search 15 December 1999	Examiner Corsi, F
CATEGORY OF CITED DOCUMENTS X : particularly relevant if taken alone Y : particularly relevant if combined with another document of the same category A : technological background O : non-written disclosure P : intermediate document		T : theory or principle underlying the invention E : earlier patent document, but published on, or after the filing date D : document cited in the application L : document cited for other reasons & : member of the same patent family, corresponding document	

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LACK OF UNITY OF INVENTION
SHEET B

Application Number
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The Search Division considers that the present European patent application does not comply with the requirements of unity of invention and relates to several inventions or groups of inventions, namely:

1. Claims: 1-49

Reduction of asymmetrical optical performance in active matrix light modulators with pixels having three optical transmission states and polarity inversion in subframes.

2. Claims: 50-60

Colour display with active matrix spatial light modulator and illumination system and polarity inversion in subframes.



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Application Number
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DOCUMENTS CONSIDERED TO BE RELEVANT			
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The present search report has been drawn up for all claims			TECHNICAL FIELDS SEARCHED (Int.Cl.6)
Place of search THE HAGUE		Date of completion of the search 15 December 1999	Examiner Corsi, F
CATEGORY OF CITED DOCUMENTS X : particularly relevant if taken alone Y : particularly relevant if combined with another document of the same category A : technological background O : non-written disclosure P : intermediate document		T : theory or principle underlying the invention E : earlier patent document, but published on, or after the filing date D : document cited in the application L : document cited for other reasons & : member of the same patent family, corresponding document	

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