



(12) **EUROPEAN PATENT APPLICATION**

(88) Date of publication A3:
07.05.2008 Bulletin 2008/19

(51) Int Cl.:
G09G 3/36^(2006.01) G02F 1/137^(2006.01)

(43) Date of publication A2:
07.07.2004 Bulletin 2004/28

(21) Application number: **03079142.0**

(22) Date of filing: **19.12.2003**

(84) Designated Contracting States:
AT BE BG CH CY CZ DE DK EE ES FI FR GB GR HU IE IT LI LU MC NL PT RO SE SI SK TR
Designated Extension States:
AL LT LV MK

(72) Inventor: **Mi, Xiang-Dong**
c/o Eastman Kodak Company
Rochester,
New York 14650-2201 (US)

(30) Priority: **31.12.2002 US 334571**

(74) Representative: **Hyden, Martin Douglas et al**
Rouse Patents
1st Floor
228-240 Banbury Road
Oxford OX2 7BY (GB)

(71) Applicant: **Industrial Technology Research Institute**
Sec. 4 Chu Tung, Hsin Chu
Taiwan 310 (CN)

(54) **A method for writing pixels in a cholesteric liquid crystal display**

(57) A method for writing pixels in a cholesteric liquid crystal display having opposing rows and columns of electrodes and cholesteric liquid crystal material disposed between the rows and columns of electrodes to define an array of pixels, the cholesteric liquid crystals having a plurality of reflective states stable in the absence of an electrical field, one state having a minimum reflection, and another state with maximum reflection includes the steps of: applying voltages to the row and column electrodes to establish a pre-selection pixel voltage having a magnitude and duration effective to change at least one possible reflective state, but ineffective to drive the liquid crystal material to a common state; applying voltages to the row and column electrodes to establish a selection pixel voltage for selecting a final reflective state for the pixel; and applying voltages to the row and column electrodes to establish a post selection pixel voltage for achieving a final desired reflective state.

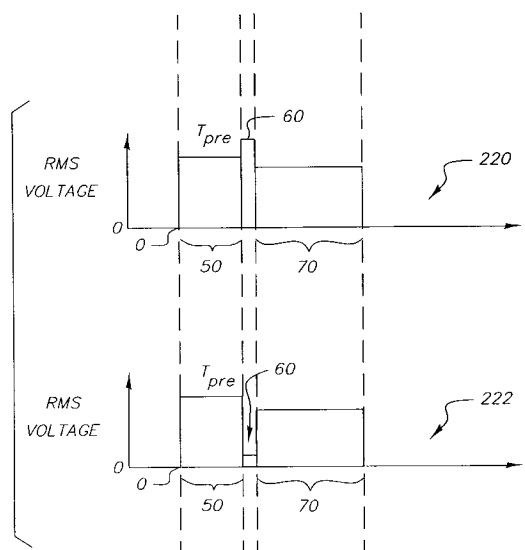


FIG. 4A



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EUROPEAN SEARCH REPORT

Application Number
EP 03 07 9142

DOCUMENTS CONSIDERED TO BE RELEVANT			
Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (IPC)
X	HUANG X-Y ET AL: "LP-1: LATE-NEWS POSTER: GRAY SCALE OF BISTABLE REFLECTIVE CHOLESTERIC DISPLAYS" 1998 SID INTERNATIONAL SYMPOSIUM DIGEST OF TECHNICAL PAPERS. ANAHEIM, CA, MAY 17 - 22, 1998, SID INTERNATIONAL SYMPOSIUM DIGEST OF TECHNICAL PAPERS, SANTA ANA, CA : SID, US, vol. VOL. 29, 17 May 1998 (1998-05-17), pages 810-813, XP000792570 * the whole document *	1-11	INV. G09G3/36 ADD. G02F1/137
X	US 2002/180683 A1 (YAGI TSUKASA [JP] ET AL) 5 December 2002 (2002-12-05) * paragraph [0038] - paragraph [0057] * * abstract; figures 3-6,8-10 *	1-11	
			TECHNICAL FIELDS SEARCHED (IPC)
			G09G G02F
The present search report has been drawn up for all claims			
Place of search Munich		Date of completion of the search 20 December 2007	Examiner Wolfrum, Georg
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	

2
EPO FORM 1503 03.82 (P04C01)



European Patent
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Application Number

EP 03 07 9142

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:
- 1-11
- ☐ The present supplementary 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 (Rule 164 (1) EPC).



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: 1-11

A method for writing pixels in a cholesteric liquid crystal display having opposing rows and columns of electrodes and cholesteric liquid crystal material disposed between the rows and columns of electrodes to define an array of pixels, the cholesteric liquid crystals having a plurality of reflective states stable in the absence of an electrical field, one state having a minimum reflection, and another state with maximum reflection, comprising the steps of:

- a) in a pre-selection step, applying voltages to the row and column electrodes to establish a pre-selection pixel voltage having a magnitude and duration effective to change at least one possible reflective state, but ineffective to drive the liquid crystal material to a common state;
- b) in a selection step, applying voltages to the row and column electrodes to establish a selection pixel voltage for selecting a final reflective state for the pixel; and
- c) in a post-selection step, applying voltages to the row and column electrodes to establish a post selection pixel voltage for achieving a final desired reflective state, wherein as a result of the pre-selection step the liquid crystal material is left in a dynamic process, which is an evolution from a planar state to a homeotropic state, an evolution from a focal conic state to a homeotropic state, an evolution from a focal conic state to a planar state, or an evolution from a planar state to a focal conic state.

2. claims: 12-26



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:

A method for writing pixels in a cholesteric liquid crystal display having opposing rows and columns of electrodes and cholesteric liquid crystal material disposed between the rows and columns of electrodes to define an array of pixels, the cholesteric liquid crystals having a plurality of reflective states stable in the absence of an electrical field, one state having a minimum reflection, and another state with maximum reflection, comprising the steps of:

- a) in a pre-selection step, applying voltages to the row and column electrodes to establish a pre-selection pixel voltage having a magnitude and duration effective to change at least one possible reflective state, but ineffective to drive the liquid crystal material to a common state;
- b) in a selection step, applying voltages to the row and column electrodes to establish a selection pixel voltage for selecting a final reflective state for the pixel; and
- c) in a post-selection step, applying voltages to the row and column electrodes to establish a post selection pixel voltage for achieving a final desired reflective state, wherein the pre-selection, selection, and post selection pixel voltages are formed from row and column voltage pulses, of which at least one is unipolar and wherein the unipolar voltage has two voltage levels.

专利名称(译)	一种在胆甾型液晶显示器中写入像素的方法		
公开(公告)号	EP1435602A3	公开(公告)日	2008-05-07
申请号	EP2003079142	申请日	2003-12-19
[标]申请(专利权)人(译)	伊斯曼柯达公司		
申请(专利权)人(译)	伊士曼柯达公司		
当前申请(专利权)人(译)	工业技术研究院		
发明人	MI, XIANG-DONG C/O EASTMAN KODAK COMPANY		
IPC分类号	G09G3/36 G02F1/137 G02F1/141 G02F1/13 G02F1/133 G09G3/20		
CPC分类号	G09G3/3629 G02F1/13718 G09G2300/0486 G09G2310/06		
优先权	10/334571 2002-12-31 US		
其他公开文献	EP1435602A2		
外部链接	Espacenet		

摘要(译)

一种用于在胆甾型液晶显示器中写入像素的方法，所述胆甾型液晶显示器具有相对的行和列的电极以及设置在所述电极的行和列之间的胆甾型液晶材料以限定像素阵列，所述胆甾型液晶具有在其中稳定的多个反射状态。没有电场，一个具有最小反射的状态，另一个具有最大反射的状态包括以下步骤：向行和列电极施加电压以建立具有有效改变的幅度和持续时间的预选像素电压。至少一种可能的反射状态，但无法将液晶材料驱动到共同状态；向行和列电极施加电压以建立选择像素电压，用于选择像素的最终反射状态；并且向行和列电极施加电压以建立后选择像素电压，以实现最终所需的反射状态。

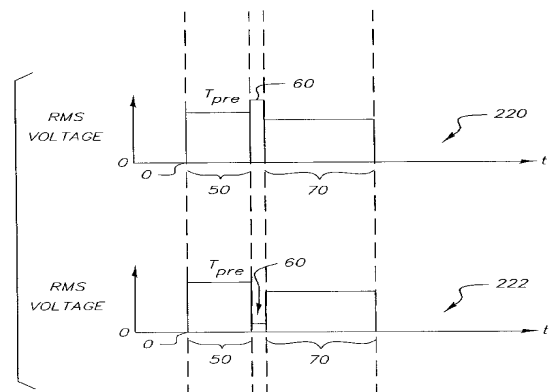


FIG. 4A