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(54) Gray scale and color cholesteric liquid crystal displays

(57) A cholesteric liquid crystal display (10) with gray scales is disclosed which includes a substrate (15), a patterned first conductor (20) disposed over the substrate, and a layer (30) including a cholesteric liquid crystal material dispersed over the first patterned conductor. The display further includes a patterned second conductor (40) disposed over the layer including cholesteric liquid crystal, and control means for applying voltages across particular portions of the patterned first and second conductors to cause electric fields to portions of the cholesteric liquid crystal layer to directly change its reflectance to a particular state having a selected gray level. The gray scale of the display can thus be obtained by a single pulse voltage independent of the initial state of the said display.

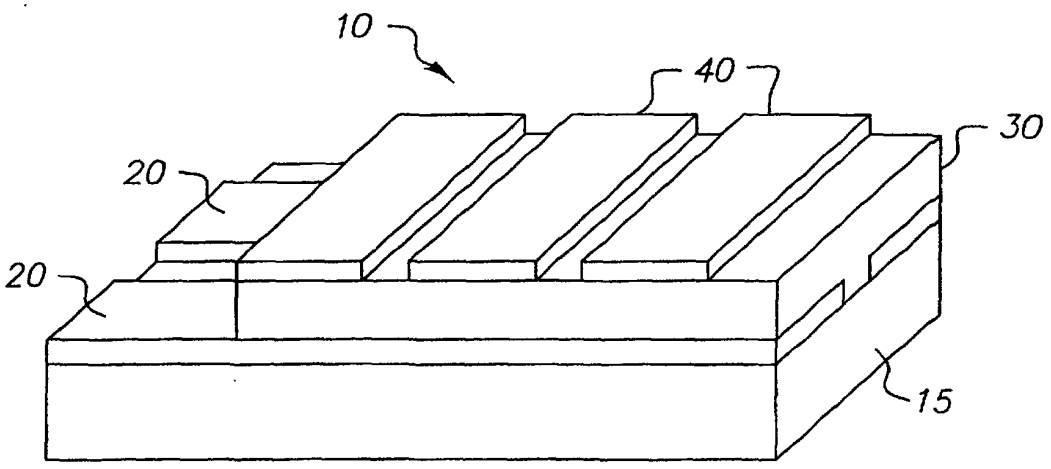

FIG. 1

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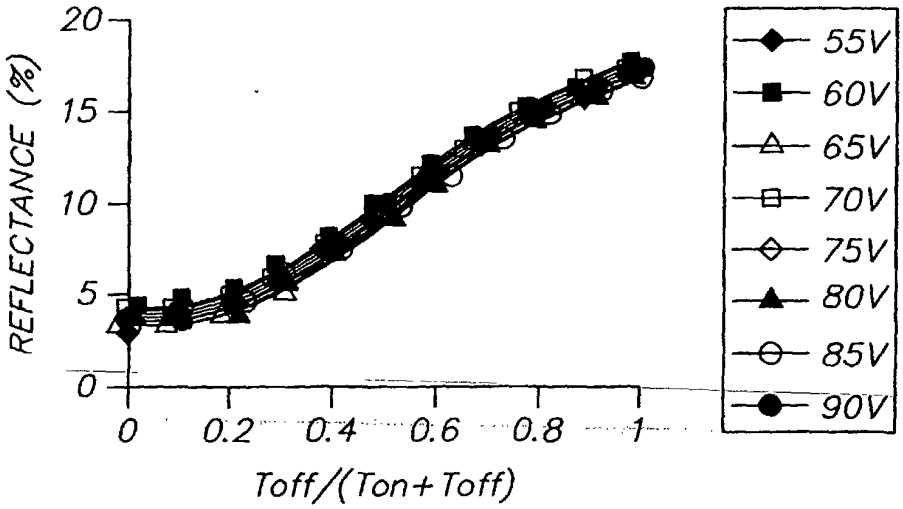
20
15
10
5
0
REFLECTANCE (%)
0
0.2
0.4
0.6
0.8
1
Toff/(Ton+Toff)
55V
60V
65V
70V
75V
80V
85V
90V

FIG. 6B

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EUROPEAN SEARCH REPORT

Application Number
EP 02 07 8067

DOCUMENTS CONSIDERED TO BE RELEVANT

Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (Int.Cl.7)
X	EP 1 116 771 A (EASTMAN KODAK CO) 18 July 2001 (2001-07-18) * column 2, line 28 - column 9, line 6; figure 2B *	1,2,4,5	G02F1/137 G02F1/1334 G09G3/36
Y		3,6	
Y	US 6 061 107 A (DOANE J WILLIAM ET AL) 9 May 2000 (2000-05-09) * column 1, line 22 - column 4, line 49; figures 1A-C,5 *	1,2,5	
Y,D	US 5 251 048 A (DOANE J WILLIAM ET AL) 5 October 1993 (1993-10-05) * column 1, line 21 - column 5, line 65 *	1-5	
Y	WO 01 20592 A (PHEIFFER MATHIAS ;THREE FIVE SYSTEMS INC (US)) 22 March 2001 (2001-03-22) * page 1, line 19 - page 6, line 26; figures 2,4,5 *	3,4	
Y,D	HUANG X Y ET AL: "FULL COLOR (4096 COLORS) REFLECTIVE CHOLESTERIC LIQUID CRYSTAL DISPLAY" PROCEEDINGS OF THE 18TH. INTERNATIONAL DISPLAY RESEARCH CONFERENCE. ASIA DISPLAY 98. SEOUL, SEPT. 28 - OCT. 1, 1998, INTERNATIONAL DISPLAY RESEARCH CONFERENCE. IDRC, SAN JOSE, CA: SID, US, vol. CONF. 18, 28 October 1998 (1998-10-28), pages 883-886, XP000921814 * page 883 - page 884; figure 1 *	6	TECHNICAL FIELDS SEARCHED (Int.Cl.7) G02F G09G

The present search report has been drawn up for all claims

Place of search	Date of completion of the search	Examiner
MUNICH	17 March 2003	Thomas, K

CATEGORY OF CITED DOCUMENTS

X : particularly relevant if taken alone
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A : technological background
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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

EPO FORM 1503 03.82 (P04C01)

ANNEX TO THE EUROPEAN SEARCH REPORT ON EUROPEAN PATENT APPLICATION NO. EP 02 07 8067

This annex lists the patent family members relating to the patent documents cited in the above-mentioned European search report. The members are as contained in the European Patent Office EDP file on
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17-03-2003

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For more details about this annex : see Official Journal of the European Patent Office, No. 12/82

专利名称(译)	灰度和彩色胆甾型液晶显示器		
公开(公告)号	EP1283435A3	公开(公告)日	2003-05-21
申请号	EP2002078067	申请日	2002-07-26
[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		
[标]发明人	STEPHENSON STANLEY WARD EASTMAN KODAK COMPANY		
发明人	MI, XIANG-DONG, EASTMAN KODAK COMPANY STEPHENSON, STANLEY WARD, EASTMAN KODAK COMPANY		
IPC分类号	G02F1/1334 G02F1/13 G02F1/133 G02F1/137 G09G3/20 G09G3/36		
CPC分类号	G02F1/13718 G02F2203/30 G09G3/2011 G09G3/2014 G09G3/3629 G09G2300/0486 G09G2310/06		
代理机构(译)	家长，YVES		
优先权	09/923659 2001-08-07 US		
其他公开文献	EP1283435A2		
外部链接	Espacenet		

摘要(译)

公开了一种具有灰度级的胆甾型液晶显示器（10），其包括基板（15），设置在基板上方的图案化第一导体（20），以及包括分散在第一图案上的胆甾型液晶材料的层（30）导体。显示器还包括设置在包括胆甾型液晶的层上方的图案化的第二导体（40），以及用于在图案化的第一和第二导体的特定部分上施加电压以使胆甾型液晶层的部分直接产生电场的控制装置。将其反射率改变为具有选定灰度级的特定状态。因此，可以通过与所述显示器的初始状态无关的单个脉冲电压来获得显示器的灰度级。

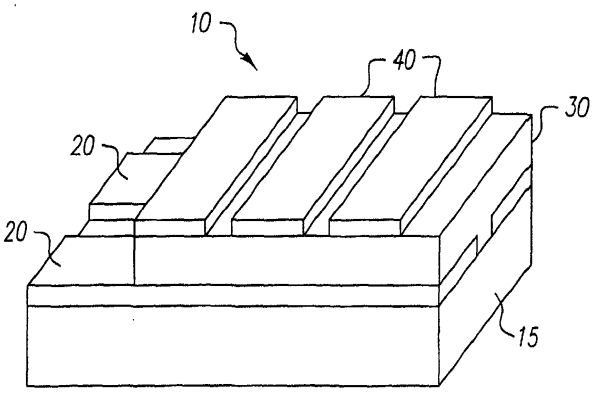

FIG. 1