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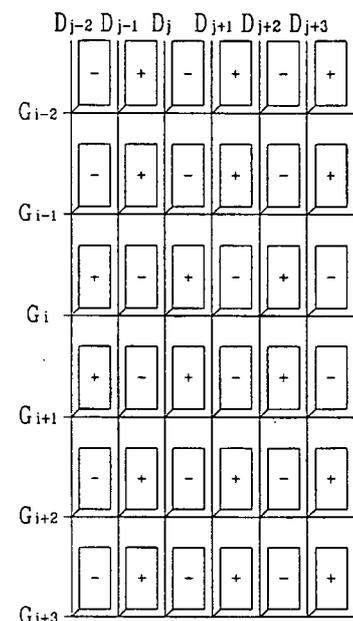
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(54) **Liquid crystal display, apparatus for driving a liquid crystal display, and method of generating gray voltages**

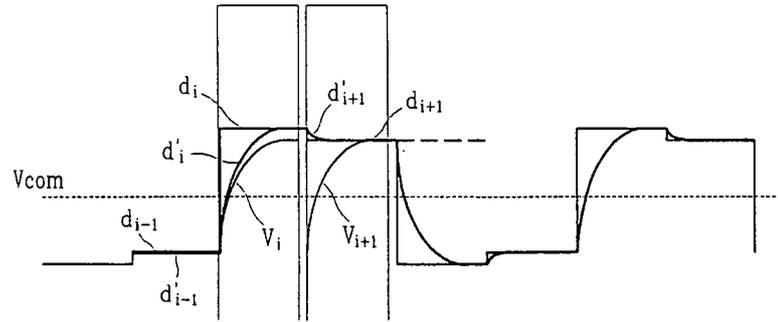
(57) A liquid crystal display, apparatus for driving a liquid crystal display and a method of driving gray voltages for the same. The liquid crystal display includes a plurality of gate lines transmitting gate signals, a plurality of data lines intersecting the plurality of gate lines and transmitting data voltages, and a plurality of pixel rows. Each pixel row includes a plurality of pixels, and each pixel includes a switching element connected to one of the plurality of gate lines and one of the plurality of data lines. The polarity of the data voltages supplied to the plurality of pixels are inverted by a pixel group including two or more pixel rows. The absolute values of the data voltages applied to one row of the pixel group with respect to a first predetermined voltage are greater than the absolute values of the data voltages applied to another row of the pixel group for the same grays.

FIG. 3



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FIG. 4





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	WO 01/24154 A (KONINKL PHILIPS ELECTRONICS NV [NL]; HAGINO SHUJI [NL]; FURUI YUKO [NL]) 5 April 2001 (2001-04-05) * figures 2,7 *	1,3,4	INV. G09G3/36
X	----- US 6 075 507 A (MIYAHARA TAE [JP] ET AL) 13 June 2000 (2000-06-13) * column 2, line 22 - line 29 * * column 4, line 6 - line 35; figures 4,7 * * column 5, line 53 - line 56; figures 5,6 * * paragraph [0001] *	1,3,4,17	
X	----- JP 10 301538 A (SHARP KK) 13 November 1998 (1998-11-13) * figures 6-9,12,16 *	17	
X	----- JP 11 271716 A (TOKYO SHIBAURA ELECTRIC CO) 8 October 1999 (1999-10-08) * paragraph [0023] - paragraph [0034]; claim 2 *	1,2,4-6	
The present search report has been drawn up for all claims			TECHNICAL FIELDS SEARCHED (IPC) G09G
Place of search Munich		Date of completion of the search 26 March 2008	Examiner Gundlach, Harald
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:
- 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: 1-4,17

With regard to the cited prior art, in particular W001/24154 and US6075507, claims 1,3,4,17 do not appear to be new or inventive.

The remaining claim 2 concerns a liquid crystal display solving the problem how to cope with voltage drop on data lines for line-paired pixel dot-inversion due to the RC delay.

2. claims: 5-16

With regard to the cited prior art, in particular W001/24154, the objective problem to be solved by this invention can be construed as how to adapt the gray voltage generation to variations in the inversion pattern.

3. claims: 18-19

With regard to the cited prior art, in particular W001/24154, the objective problem to be solved by this invention can be construed as how to generate the reference voltages required for compensation of grey scale generation in line-paired pixel dot-inversion.

**ANNEX TO THE EUROPEAN SEARCH REPORT
ON EUROPEAN PATENT APPLICATION NO.**

EP 02 01 9833

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 The European Patent Office is in no way liable for these particulars which are merely given for the purpose of information.

26-03-2008

Patent document cited in search report		Publication date	Patent family member(s)	Publication date
WO 0124154	A	05-04-2001	JP 2001108964 A	20-04-2001
US 6075507	A	13-06-2000	JP 3039404 B2	08-05-2000
			JP 10171412 A	26-06-1998
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JP 10301538	A	13-11-1998	JP 3343048 B2	11-11-2002
JP 11271716	A	08-10-1999	NONE	

专利名称(译)	液晶显示器，用于驱动液晶显示器的装置和产生灰度电压的方法		
公开(公告)号	EP1293957A3	公开(公告)日	2008-04-30
申请号	EP2002019833	申请日	2002-09-06
[标]申请(专利权)人(译)	三星电子株式会社		
申请(专利权)人(译)	SAMSUNG ELECTRONICS CO. , LTD.		
当前申请(专利权)人(译)	三星DISPLAY CO. , LTD.		
发明人	MOON, SEUNG-HWAN, SHINBANPO 4-CHA APT.210-404, KANG, NAM-SOO, PURUN MAEUL JOOKONG 5-DANJI		
IPC分类号	G09G3/36 G02F1/133 G02F1/136 G09G3/20		
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优先权	1020010055036 2001-09-07 KR		
其他公开文献	EP1293957A2 EP1293957B1		
外部链接	Espacenet		

摘要(译)

液晶显示器，用于驱动液晶显示器的装置和用于驱动液晶显示器的灰度电压的方法。液晶显示器包括传输栅极信号的多条栅极线，与多条栅极线交叉并传输数据电压的多条数据线，以及多个像素行。每个像素行包括多个像素，并且每个像素包括连接到多条栅极线之一和多条数据线之一的开关元件。提供给多个像素的数据电压的极性被包括两个或更多个像素行的像素组反转。相对于第一预定电压施加到像素组的一行的数据电压的绝对值大于施加到相同灰度的像素组的另一行的数据电压的绝对值。

