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(71) Applicant: **SHARP KABUSHIKI KAISHA**
Osaka 545 (JP)

(72) Inventors:
- **Cairns, Graham Andrew**
  Oxford OX2 8NH (GB)
- **Brownlow, Michael James**
  Oxford OX4 4YB (GB)
- **Walton, Harry Garth**
  Oxford OX4 3NE (GB)
- **Kay, Andrew**
  Oxford OX4 1HA (GB)

(74) Representative: **Asquith, Julian Peter**
Marks & Clerk,
4220 Nash Court,
Oxford Business Park South
Oxford OX4 2RU (GB)

(54) Automated analysis of images for liquid crystal displays.

(57) 1. A driving arrangement for an active matrix liquid crystal display comprises:

(a) a multi-format digital data driver arranged to operate in a plurality of different display modes, to receive digital input data in a plurality of different formats, and to drive data lines of the liquid crystal display so as to cause an image to be displayed in the display corresponding to said input data; and

(b) data analysis means arranged to receive said digital input data, to determine the format of the input data, and to control the data driver to operate in the display mode corresponding to the format of the input data.

There is also provided a method of reducing the power required to display a sequence of images on a liquid crystal display, in which images are analysed and if consecutive images are the same, or substantially the same, then the liquid crystal display is not updated with at least the subsequent image.

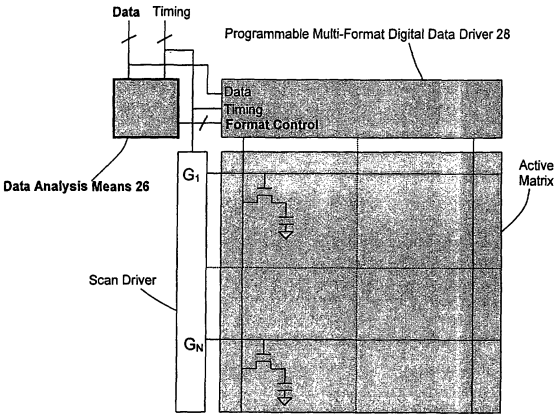

Figure 9 Basic embodiment of the invention – content driven format control

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EUROPEAN SEARCH REPORT

Application Number
EP 01 30 7410

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)
A	EP 0 930 716 A (SHARP KK) 21 July 1999 (1999-07-21) * abstract * * column 1, line 15 - line 51; figure 1 * * column 3, line 41 - column 4, line 37 * * column 5, line 58 - column 7, line 5; figure 5 * ---	1-5,9-16	G09G3/36
E	US 2002/041245 A1 (DACHS CATHERINE ROSINDA MARIE ET AL) 11 April 2002 (2002-04-11) * abstract * * paragraph [0004] * * paragraph [0015] * * paragraph [0073] - paragraph [0074]; figures 11,12 * ---	1-5,9-16	
E	US 2002/000970 A1 (AKIMOTO HAJIME ET AL) 3 January 2002 (2002-01-03) * abstract * * paragraph [0011] - paragraph [0016]; figure 1 * * paragraph [0045] - paragraph [0049]; figures 1-12 * * paragraph [0057] - paragraph [0067]; figure 7 * ---	1-5,9-16	TECHNICAL FIELDS SEARCHED (Int.Cl.7) G09G H03M
X	EP 0 655 725 A (ROHM CO LTD) 31 May 1995 (1995-05-31) * the whole document * ---	6,7,17, 18,25-28	
X	EP 0 651 367 A (ROHM CO LTD) 3 May 1995 (1995-05-03) * abstract * * claim 1; figures 2,5 * * column 2, line 3 - column 3, line 5; figure 5 * * column 6, line 41 - column 6, line 49; figure 4 * --- -/--	6,17,18	

The present search report has been drawn up for all claims

Place of search	Date of completion of the search	Examiner
MUNICH	11 March 2003	Wolff, L

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

EPO FORM 1503 03.82 (P04C01)

European Patent Office

EUROPEAN SEARCH REPORT

Application Number
EP 01 30 7410

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	US 5 812 149 A (KAWASAKI YUJI ET AL) 22 September 1998 (1998-09-22) * the whole document * ---	6,17	
A	PATENT ABSTRACTS OF JAPAN vol. 014, no. 105 (E-0895), 26 February 1990 (1990-02-26) & JP 01 307384 A (MATSUSHITA ELECTRIC IND CO LTD), 12 December 1989 (1989-12-12) * abstract * -----	6,8, 17-40	
			TECHNICAL FIELDS SEARCHED (Int.Cl.7)

The present search report has been drawn up for all claims

Place of search	Date of completion of the search	Examiner
MUNICH	11 March 2003	Wolff, L

CATEGORY OF CITED DOCUMENTS

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EPO FORM 1503 03.82 (P04C01)

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Application Number
EP 01 30 7410

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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LACK OF UNITY OF INVENTION SHEET B

Application Number
EP 01 30 7410

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: 1-5,9-16

The set of claims 1 to 5 and 9 to 16 define a driver dedicated to active matrix liquid crystal display, this driver having the specific features of receiving multi format digital data in order to display images in accordance with, and comprising a data analysis means permitting to control the data driver according to the digital data format: : The driver is operated either in low resolution display mode in order to save power consumption or in high resolution mode in order to display high picture quality.

2. Claims: 6-8,17-40

The set of claims 6 to 8 and 17 to 40 define an apparatus and a method of reducing the power consumption required to display images. This method is based on image processing which comprises the step of analysing the image, comparing the current picture with the previous one and according to the obtained result, the final step is to update or not the displayed picture on the liquid crystal display leading to reduced power consumption.

ANNEX TO THE EUROPEAN SEARCH REPORT ON EUROPEAN PATENT APPLICATION NO. EP 01 30 7410

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.

11-03-2003

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EPO FORM P0459

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

专利名称(译)	液晶显示器图像的自动分析。		
公开(公告)号	EP1184836A3	公开(公告)日	2003-05-07
申请号	EP2001307410	申请日	2001-08-31
[标]申请(专利权)人(译)	夏普株式会社		
申请(专利权)人(译)	夏普株式会社		
当前申请(专利权)人(译)	夏普株式会社		
[标]发明人	CAIRNS GRAHAM ANDREW BROWNLOW MICHAEL JAMES WALTON HARRY GARTH KAY ANDREW		
发明人	CAIRNS, GRAHAM ANDREW BROWNLOW, MICHAEL JAMES WALTON, HARRY GARTH KAY, ANDREW		
IPC分类号	G02F1/1368 G02F1/133 G09G3/20 G09G3/36 G09G5/00		
CPC分类号	G09G3/3611 G09G3/2025 G09G3/3614 G09G3/3648 G09G3/3688 G09G5/005 G09G5/006 G09G2310/027 G09G2310/04 G09G2320/103 G09G2330/021 G09G2330/022 G09G2340/0428		
代理机构(译)	阿斯奎斯，朱利安PETER		
优先权	2000021712 2000-09-05 GB		
其他公开文献	EP1184836B1 EP1184836A2		
外部链接	Espacenet		

摘要(译)

1.一种用于有源矩阵液晶显示器的驱动装置，包括：（a）多格式数字数据驱动器，用于以多种不同的显示模式操作，以多种不同的格式接收数字输入数据，并驱动液晶显示器的数据线，以使图像显示在与所述输入数据相对应的显示器中；（b）数据分析装置，用于接收所述数字输入数据，确定输入数据的格式，以及控制数据驱动器在与输入数据的格式对应的显示模式下操作。还提供了一种降低在液晶显示器上显示图像序列所需的功率的方法，其中分析图像并且如果连续图像相同或基本相同，则不更新液晶显示器。至少后续的图像。

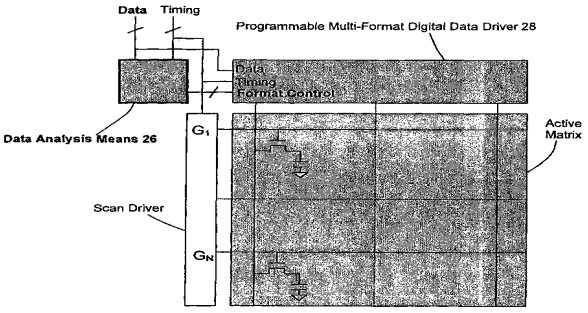

Figure 9 Basic embodiment of the invention – content driven format control