(19) Europäisches Patentamt
European Patent Office
Office européen des brevets

(11) **EP 1 863 008 A3**

(12) **EUROPEAN PATENT APPLICATION**

(88) Date of publication A3:
01.07.2009 Bulletin 2009/27

(43) Date of publication A2:
05.12.2007 Bulletin 2007/49

(21) Application number: **07108548.4**

(22) Date of filing: **21.05.2007**

(51) Int Cl.:
G09G 3/34 *(2006.01)*

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

(30) Priority: **02.06.2006 EP 06290910**

(71) Applicant: **Thomson Licensing**
92100 Boulogne-Billancourt (FR)

(72) Inventors:
- **Ploquin, Didier**
  38500 Parthenay de Bretagne (FR)
- **Machand, Philippe**
  35500 Vitre (FR)
- **Morizot, Gérard**
  35500 Voiron (FR)

(74) Representative: **Lindemann, Robert**
Deutsche Thomson OHG
European Patent Operations
Karl-Wiechert-Allee 74
30625 Hannover (DE)

(54) Method and circuit for controlling the backlighting system of a display apparatus

(57) In a display device images are reproduced by controlling the amount of light provided by a light source by means of light modulators for individual pixels. Subsequent images are synchronised to each other by synchronisation signals (VB) regularly occurring at intervals corresponding to first time periods. The backlight is controlled to emit light during fractions of second time periods or whole second time periods which are equal to or shorter than first time periods. Several of the second time periods may be nested and evenly distributed within the first time period. The signals for driving the backlight are preferably generated in synchronism with the horizontal pixel clock. Each of the fractions of second time periods or whole second time periods during which light is emitted is divided into a number of elementary steps, wherein each elementary step corresponds to a number of pixel clock periods. The number of elementary steps is chosen according to the desired ratio of control of the backlight or contrast ratio, e.g. 100 elementary steps for a contrast ratio of 1:100. During each of the second time periods the backlight is controlled to be on for a number of elementary steps corresponding to the desired contrast ratio.

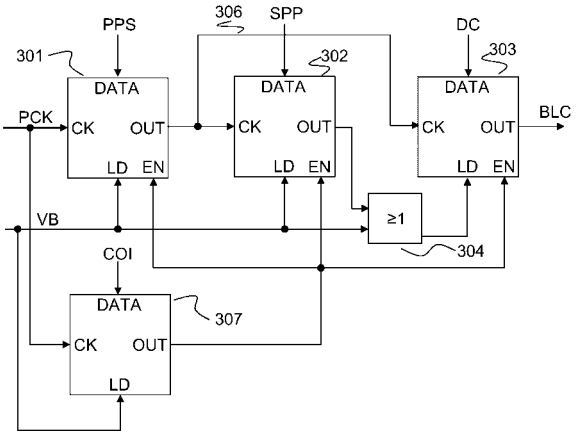

Fig. 5

EP 1 863 008 A3

Europäisches Patentamt
European Patent Office
Office européen des brevets

EUROPEAN SEARCH REPORT

Application Number
EP 07 10 8548

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	US 2005/078081 A1 (ODA KYOICHIRO [JP] ET AL) 14 April 2005 (2005-04-14) * paragraph [0160] - paragraph [0163]; figure 4 * * paragraph [0195] - paragraph [0199]; figures 9,10 * * paragraph [0202] - paragraph [0206]; figures 12,13 * -----	1-11	INV. G09G3/34
X	EP 0 685 831 A1 (SHARP KK [JP]) 6 December 1995 (1995-12-06) * column 13, line 32 - column 16, line 32; figures 1,7-15 * * column 21, line 14 - column 22, line 14; figures 1,2 * * column 25, line 48 - column 26, line 11; figure 2 * * column 28, line 14 - column 29, line 19; figure 2 * * column 30, line 34 - column 32, line 47; figure 2 * -----	1-11	
X	US 2004/160435 A1 (CUI YING [US] ET AL) 19 August 2004 (2004-08-19) * paragraph [0045] - paragraph [0048]; figure 5 * -----	1,9	TECHNICAL FIELDS SEARCHED (IPC) G09G
X	US 5 184 117 A (GAUTHIER LLOYD W [US]) 2 February 1993 (1993-02-02) * column 2, line 63 - column 5, line 7; figures 1,2 * -----	1,9	
A	EP 1 489 590 A (MATSUSHITA ELECTRIC IND CO LTD [JP]) 22 December 2004 (2004-12-22) * paragraph [0008] - paragraph [0011]; figures 20-22 * * paragraph [0016] - paragraph [0038]; figures 1-9 * -----	1-11	

-/--

The present search report has been drawn up for all claims

Place of search	Date of completion of the search	Examiner
Munich	12 May 2009	Morris, David

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

6

EPO FORM 1503 03.82 (P04C01)

Europäisches Patentamt
European Patent Office
Office européen des brevets

EUROPEAN SEARCH REPORT

Application Number
EP 07 10 8548

DOCUMENTS CONSIDERED TO BE RELEVANT

Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (IPC)
A	US 2005/052398 A1 (TAKAOKA HIRONORI [JP] ET AL) 10 March 2005 (2005-03-10) * paragraph [0039] - paragraph [0043]; figure 2 *	1-11	
A	US 2003/011559 A1 (ADACHI KATSUMI [JP] ET AL) 16 January 2003 (2003-01-16) * paragraph [0011] - paragraph [0014] * * paragraph [0052] - paragraph [0063]; figures 1-5,11 *	1-11	

TECHNICAL FIELDS SEARCHED (IPC)

The present search report has been drawn up for all claims

Place of search	Date of completion of the search	Examiner
Munich	12 May 2009	Morris, David

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)

ANNEX TO THE EUROPEAN SEARCH REPORT ON EUROPEAN PATENT APPLICATION NO. EP 07 10 8548

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.

12-05-2009

Patent document cited in search report	Publication date	Patent family member(s)	Publication date
US 2005078081 A1	14-04-2005	NONE	
EP 0685831 A1	06-12-1995	DE 69512704 D1	18-11-1999
		DE 69512704 T2	27-04-2000
		JP 3027298 B2	27-03-2000
		JP 7325286 A	12-12-1995
US 2004160435 A1	19-08-2004	CN 1521723 A	18-08-2004
		EP 1593111 A2	09-11-2005
		JP 2006517303 T	20-07-2006
		KR 20050097546 A	07-10-2005
		TW 270838 B	11-01-2007
		WO 2004075155 A2	02-09-2004
US 5184117 A	02-02-1993	NONE	
EP 1489590 A	22-12-2004	CA 2458214 A1	09-10-2003
		CN 1565014 A	12-01-2005
		WO 03083820 A1	09-10-2003
		TW 256032 B	01-06-2006
		US 2005007389 A1	13-01-2005
US 2005052398 A1	10-03-2005	NONE	
US 2003011559 A1	16-01-2003	US 2007030241 A1	08-02-2007

EPO FORM P0459

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