



(12) **EUROPEAN PATENT APPLICATION**

(88) Date of publication A3:
10.10.2007 Bulletin 2007/41

(51) Int Cl.:
G09G 3/28 (2006.01)

(43) Date of publication A2:
14.07.2004 Bulletin 2004/29

(21) Application number: **04290015.9**

(22) Date of filing: **06.01.2004**

(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

- **Thebault, Cedric**
78050 Villingen (DE)
- **Correa, Carlos**
78056 Villingen-Schwenningen (DE)

(30) Priority: **10.01.2003 EP 03290062**

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

(74) Representative: **Ruellan-Lemonnier, Brigitte Thomson,**
European Patent Operations,
46 Quai Alphonse Le Gallo
92648 Boulogne Cedex (FR)

(72) Inventors:
• **Weitbruch, Sebastien**
78087 Monchweiler (DE)

(54) **Method for optimizing brightness in a display device and apparatus for implementing the method**

(57) The invention relates to a method for optimizing brightness in a display device having a plurality of luminous elements corresponding to the pixels of a picture, wherein the time duration of a video frame or video field is divided into a plurality of sub fields during which the luminous elements can be activated for light emission with sustain pulses corresponding to a sub field code word which is used for brightness control, the total number of sustain pulses being determined in view of a selected power mode function of picture load the method including the following steps:

- setting a threshold value in relation to the picture load,
- comparing, for a frame, the number of the current sustain pulse to said threshold value,
- if the number of the current sustain pulses is below the threshold value, the sustain pulses are generated at a fixed frequency,
- if the number of the current sustain pulses is above the threshold value, the sustain pulses are generated at an evolving frequency.

This invention applies mainly to PDP and all displays controlled by using a PWM.

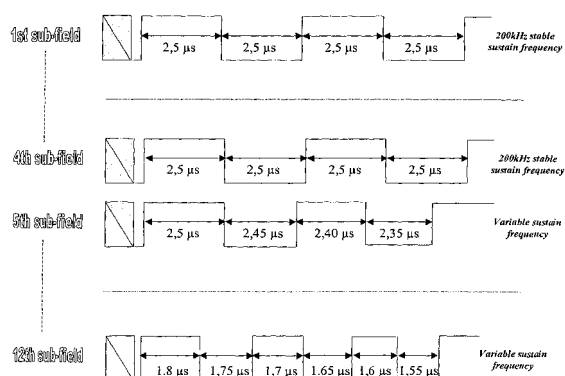


FIGURE 6



European Patent
Office

EUROPEAN SEARCH REPORT

Application Number
EP 04 29 0015

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 5 745 085 A (UEDA TOSHIO ET AL) 28 April 1998 (1998-04-28) * column 4, line 16 - column 5, line 21 * * column 8, line 47 - column 9, line 3 * * figures 1,9,12,13 * -----	1,2,4,6	INV. G09G3/28
A	US 5 329 288 A (KIM SANG-CHEOL) 12 July 1994 (1994-07-12) * column 1, line 43 - line 54 * * column 2, line 52 - line 64 * * column 3, line 59 - column 5, line 2 * * figures 2-4 * -----	1,6	
A,D	WO 02/11111 A (THOMSON LICENSING ET AL) 7 February 2002 (2002-02-07) * page 11, line 30 - page 12, line 31 * * page 19, line 10 - line 22 * * page 23, line 7 - line 8 * * figures 5,9,10 * -----	1,6	
A	US 6 496 165 B1 (SATO NARUHIRO ET AL) 17 December 2002 (2002-12-17) * column 3, line 47 - line 67 * * column 7, line 36 - column 8, line 9 * * figures 1,6,7 * -----	1,6	TECHNICAL FIELDS SEARCHED (IPC) G09G
A	EP 0 674 303 A (FUJITSU LTD) 27 September 1995 (1995-09-27) * page 4, line 47 - page 5, line 26 * * page 6, line 31 - line 39 * * figures 1,9 * -----	1,6	
A	US 6 388 678 B1 (MORITA TOMOKO ET AL) 14 May 2002 (2002-05-14) -----		
A	US 2002/140636 A1 (SCHREUDERS HERMAN ET AL) 3 October 2002 (2002-10-03) -----		
The present search report has been drawn up for all claims			
Place of search Munich		Date of completion of the search 28 August 2007	Examiner Farricella, Luigi
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			

5
EPO FORM 1503 03.82 (P04C01)

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

EP 04 29 0015

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.

28-08-2007

Patent document cited in search report		Publication date	Patent family member(s)	Publication date
US 5745085	A	28-04-1998	NONE	
US 5329288	A	12-07-1994	DE 4200754 A1 GB 2260013 A JP 6043826 A	08-04-1993 31-03-1993 18-02-1994
WO 0211111	A	07-02-2002	AU 1042702 A CN 1444756 A DE 60108987 D1 DE 60108987 T2 JP 2004506927 T US 2004061695 A1	13-02-2002 24-09-2003 24-03-2005 14-07-2005 04-03-2004 01-04-2004
US 6496165	B1	17-12-2002	JP 3695737 B2 JP 2001013921 A	14-09-2005 19-01-2001
EP 0674303	A	27-09-1995	NONE	
US 6388678	B1	14-05-2002	CN 1246950 A DE 69811636 D1 DE 69811636 T2 EP 0958572 A1 WO 9930308 A1 JP 2994631 B2 JP 11231833 A TW 514851 B	08-03-2000 03-04-2003 18-12-2003 24-11-1999 17-06-1999 27-12-1999 27-08-1999 21-12-2002
US 2002140636	A1	03-10-2002	AU 2098102 A CN 1425175 A WO 0250808 A2 JP 2004516513 T	01-07-2002 18-06-2003 27-06-2002 03-06-2004