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(54) **Liquid crystal display and driving method thereof**

(57) A method of optimizing pixel signals for a liquid crystal display includes receiving the first, second and third pixel signals for the (n-1), (n) and (n+1)th frames. The first and second pixel signals are compared to determine if the second pixel signal requires overshooting

or undershooting. The second and third pixel signals are compared to determine if the second pixel signal requires to be increased for pre-tilting. The second pixel signal is compensated accordingly, thereby increasing liquid crystal response time.

FIG.3

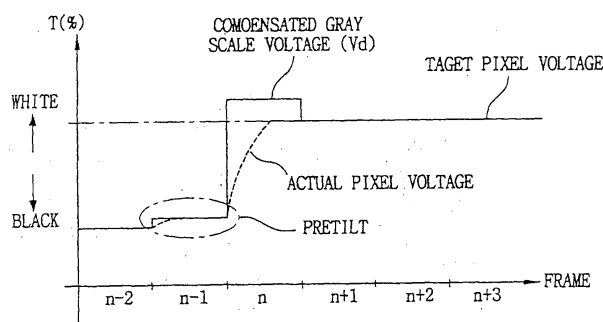
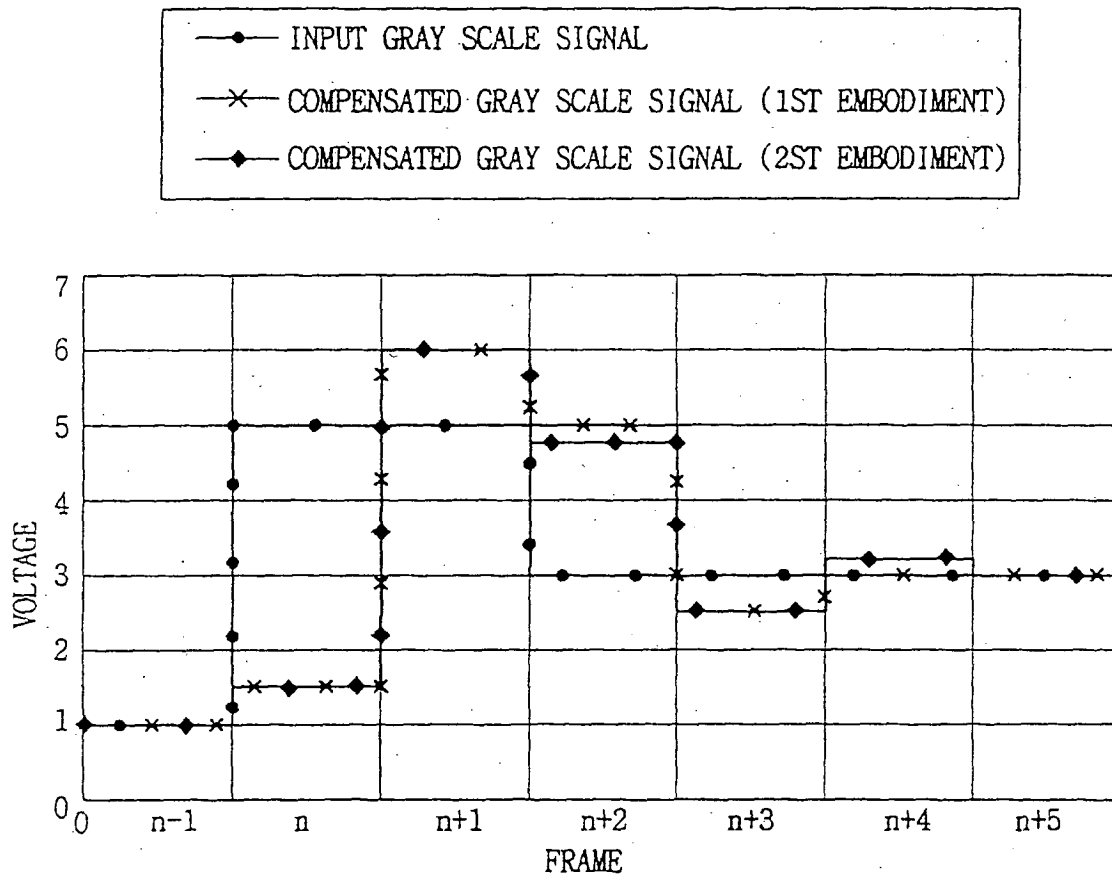


FIG. 8





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# EUROPEAN SEARCH REPORT

Application Number  
EP 04 25 2042

| 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,D   | US 2001/038372 A1 (LEE BAEK-WOON)<br>8 November 2001 (2001-11-08)<br>* figures 9-14 *      | 1-43                             | INV.<br>G09G3/36                        |
| A   | US 5 528 257 A (OKUMURA HARUHIKO [JP] ET AL)<br>18 June 1996 (1996-06-18)<br>* figure 15 * | 44-60                            |   |
|   |  |                                  | TECHNICAL FIELDS SEARCHED (IPC)         |
|   |  |                                  | G09G                                    |
| The present search report has been drawn up for all claims  |  |                                  |   |
| Place of search   |  | Date of completion of the search | Examiner                                |
| Munich  |  | 19 March 2008                    | Gundlach, Harald                        |
| <p>CATEGORY OF CITED DOCUMENTS</p> <p>X : particularly relevant if taken alone<br/> Y : particularly relevant if combined with another document of the same category<br/> A : technological background<br/> O : non-written disclosure<br/> P : intermediate document</p> <p>T : theory or principle underlying the invention<br/> E : earlier patent document, but published on, or after the filing date<br/> D : document cited in the application<br/> L : document cited for other reasons<br/> &amp; : member of the same patent family, corresponding document</p> |  |                                  |   |

7

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European Patent  
Office

Application Number

EP 04 25 2042

### 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).



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**LACK OF UNITY OF INVENTION**  
**SHEET B**

Application Number  
EP 04 25 2042

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: 1-43

These claims concern a method for optimizing pixel signals for a liquid crystal display and a liquid crystal display.

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2. claims: 44-60

These claims concern also a method for optimizing pixel signals for a liquid crystal display and a liquid crystal display.

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

EP 04 25 2042

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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19-03-2008

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|----------------|--|---------|------------|
| 专利名称(译)        | 液晶显示器及其驱动方法  |         |            |
| 公开(公告)号        | <a href="#">EP1467346A3</a>  | 公开(公告)日 | 2008-04-30 |
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| 发明人            | SONG, JANG-KUN<br>PARK, DONG-WON   |         |            |
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| CPC分类号         | G09G5/395 G09G3/2011 G09G3/2018 G09G3/3648 G09G3/3688 G09G3/3696 G09G5/06 G09G5/397<br>G09G2310/027 G09G2310/06 G09G2320/0242 G09G2320/0252 G09G2320/0276 G09G2340/0428<br>G09G2340/16 |         |            |
| 优先权            | 1020030061880 2003-09-04 KR<br>1020030021638 2003-04-07 KR<br>1020030067298 2003-09-29 KR  |         |            |
| 其他公开文献         | EP1467346B1<br>EP1467346A2   |         |            |
| 外部链接           | <a href="#">Espacenet</a>  |         |            |

#### 摘要(译)

一种优化用于液晶显示器的像素信号的方法包括接收第  $(n-1)$  ,  $(n)$  和  $(n+1)$  帧的第一, 第二和第三像素信号。比较第一和第二像素信号以确定第二像素信号是否需要过冲或下冲。比较第二和第三像素信号以确定是否需要增加第二像素信号以进行预标题。相应地补偿第二像素信号, 从而增加液晶响应时间。

FIG.3

