Title: LIQUID CRYSTAL DISPLAY APPARATUS AND LIQUID CRYSTAL PANEL DRIVING METHOD

Abstract: A liquid crystal display apparatus includes common voltage generator circuit (5) for supplying a common voltage to a common electrode connected in common to a plurality of liquid crystal cells which form part of liquid crystal panel (9); liquid crystal driving circuit (2) for inversely driving liquid crystal panel (9); timer (8) for measuring a time for which liquid crystal panel 9 has been used; storage unit (10) for storing characteristic data which represents the relationship between used hours of liquid crystal panel (9) and an optimal value for the common voltage; and control unit (4) for determining a time for which liquid crystal panel (9) has been used up to the present time based on a measurement result by timer (8), retrieving an optimal value for the common voltage for the determined used time with reference to the characteristic data stored in storage unit (10), and controlling such that a magnitude of the common voltage output from the common voltage generator circuit is equal to the optimal value.
INTERNATIONAL SEARCH REPORT

A. CLASSIFICATION OF SUBJECT MATTER

INV. G09G3/36

According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)
G09G

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practical, search terms used)

EPO-Internal , WPI Data

C. DOCUMENTS CONSIDERED TO BE RELEVANT

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<td>A</td>
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X Further documents are listed in the continuation of Box C.  
X See patent family annex.

Special categories of cited documents :
- 'A' document defining the general state of the art which is not considered to be of particular relevance
- 'E' earlier document but published on or after the international filing date
- 'L' document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified)
- 'O' document referring to an oral disclosure, use, exhibition or other means
- 'P' document published prior to the international filing date but later than the priority date claimed

'T' later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention

'X' document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone

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'S' document member of the same patent family

Date of the actual completion of the international search: 29 July 2008
Date of mailing of the international search report: 04/09/2008

Name and mailing address of the ISA/EUROPEAN PATENT OFFICE, P.B. 5818 Patentaal 2 NL-2280 HV RIJSWIJK Tel. (+31-70) 340-2040, Tx. 31651 epo nl, Fax (+31-70) 340-3016

Authorized officer: Bader, Arnaud

Form PCT/ISA/210 (second sheet) (April 2005)
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### INTERNATIONAL SEARCH REPORT

#### Box No. II  Observations where certain claims were found unsearchable (Continuation of item 2 of first sheet)

This international search report has not been established in respect of certain claims under Article 17(2)(a) for the following reasons:

1.☐ Claims Nos.: because they relate to subject matter not required to be searched by this Authority, namely:

2.☐ Claims Nos.: because they relate to parts of the international application that do not comply with the prescribed requirements to such an extent that no meaningful international search can be carried out, specifically:

3.☐ Claims Nos.: because they are dependent claims and are not drafted in accordance with the second and third sentences of Rule 6.4(a).

#### Box No. III  Observations where unity of invention is lacking (Continuation of item 3 of first sheet)

This International Searching Authority found multiple inventions in this international application, as follows:

> see additional sheet

1.☑ As all required additional search fees were timely paid by the applicant, this international search report covers all searchable claims.

2.☐ As all searchable claims could be searched without effort justifying an additional fee, this Authority did not invite payment of additional fees.

3.☐ As only some of the required additional search fees were timely paid by the applicant, this international search report covers only those claims for which fees were paid, specifically claims Nos.:

4.☐ No required additional search fees were timely paid by the applicant. Consequently, this international search report is restricted to the invention first mentioned in the claims; it is covered by claims Nos.

**Remark on Protest**

☐ The additional search fees were accompanied by the applicant’s protest and, where applicable, the payment of a protest fee.

☐ The additional search fees were accompanied by the applicant’s protest but the applicable protest fee was not paid within the time limit specified in the invitation.

☒ No protest accompanied the payment of additional search fees.
This International Searching Authority found multiple (groups of) inventions in this international application, as follows:

1. claims: 1-3, 6-10

   Control of common voltage Vcom in a liquid crystal display using frame inversion, on the base of the elapsed operation time of the display: the common voltage is modified according to tables or calculation directly dependent on the elapsed operating time to prevent burn-in.

   ___

2. claims: 4, 5, 11-13

   Control of common voltage Vcom in a liquid crystal display using frame inversion, on the base of the temperature of the display: the common voltage is modified according to tables or calculation directly dependent on the temperature to prevent burn-in.

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