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**Datasheet for the decision
of 17 May 2018**

Case Number: T 2185/13 - 3.4.03

Application Number: 09011359.8

Publication Number: 2202719

IPC: G09G3/36

Language of the proceedings: EN

Title of invention:

Liquid crystal display and method of driving the same

Applicant:

Samsung Display Co., Ltd.

Headword:

Relevant legal provisions:

EPC Art. 123(2)

Keyword:

Amendments - added subject-matter (yes)

Decisions cited:

Catchword:



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Chambres de recours

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Case Number: T 2185/13 - 3.4.03

D E C I S I O N
of Technical Board of Appeal 3.4.03
of 17 May 2018

Appellant: Samsung Display Co., Ltd.
(Applicant) 17113, 1, Samsung-ro
Giheung-Gu
Yongin-si
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Decision under appeal: **Decision of the Examining Division of the
European Patent Office posted on 16 April 2013
refusing European patent application No.
09011359.8 pursuant to Article 97(2) EPC.**

Composition of the Board:

Chairman G. Eliasson
Members: T. M. Häusser
C. Heath

Summary of Facts and Submissions

I. The appeal concerns the decision of the examining division refusing the European patent application No. 09 011 359 for added subject-matter (Article 123(2) EPC), insufficient disclosure (Article 83 EPC), lack of inventive step (Article 56 EPC), and non-compliance with Rule 42(1)(c) EPC.

II. Oral proceedings took place before the board in the absence of the appellant (applicant), of which the board had been informed beforehand.

In writing the appellant had requested that the decision under appeal be set aside and a patent be granted based on the set of claims filed with the grounds of appeal dated 8 August 2013.

III. The wording of independent claim 1 of the sole request is as follows (board's labelling "(a)" to "(e)"):

"1. A liquid crystal display comprising:

(a) a timing controller (201) with a signal correction unit (231) arranged to receive a current primitive image signal (DAT_n) corresponding to a second gray level, to generate a corrected image signal (DAT_n');

(b) a liquid crystal panel configured to display an image based on the corrected image signal;

(c) a memory (220), which stores a previous converted image signal (tDAT_{n-1}) corresponding to a first gray level;

(d) a signal conversion unit (211), arranged to receive the previous converted image signal (tDAT_{n-1}) from the memory (220) and the current primitive image signal (DAT_n) and to generate a current converted

image signal (tDATn) for replacing the previous converted image signal (tDATn-1) in the memory (220);

(e) characterized in that the timing controller (201) further comprises:

a signal compensation unit (241), arranged to receive, when the second gray level is lower than the first gray level, a conversion flag signal (FLAG) transmitted from the signal conversion unit (211), indicating the generation of a current converted image signal (tDATn) corresponding to a third gray level higher than the second gray level, and arranged to receive the previous converted image signal (tDATn-1) in response to the conversion flag signal (FLAG) and to generate a previous compensated image signal (ttDATn-1) based on the current primitive image signal (DATn) and to transmit the previous compensated image signal (ttDATn-1) to the signal correction unit (231) for the generation of the corrected image signal (DATn'), wherein the signal compensation unit (241) comprises means for comparing the gray level of the current primitive image signal (DATn) with a reference gray level (Gref) to select a compensation method for the generation of the previous compensated image signal (ttDATn-1) from the previous converted image signal (tDATn-1) and the current primitive image signal (DATn)."

IV. The appellant (applicant) argued essentially as follows concerning the basis for the amendments in relation to claim 1:

Claim 1 had been amended by introducing first, second, and third gray levels corresponding to the previous converted, the current primitive, and the current con-

verted image signal, respectively. Moreover, it was specified in claim 1 that

- the second gray level was lower than the first gray level,
- the third gray level was higher than the second gray level,
- the reception of the previous converted image signal and the current primitive image signal and the generation of the previous compensated image signal was in response to the conversion flag signal, and
- the generation of the previous/second compensated image signal was based on the current/third primitive image signal.

The basis for these amendments could be found in the description relating to Figures 5 and 6 in paragraphs [0050] to [0054]. Moreover, the feature of the liquid crystal display comprising a liquid crystal panel configured to display an image based on the corrected image signal was based on claim 1 as originally filed.

Reasons for the Decision

1. Amendments

- 1.1 In the decision under appeal the examining division held that claim 1 of the request pending at the time contained subject-matter extending beyond the content of the application as filed. In particular, the conditions under which the conversion flag signal was generated and the previous converted image signal received by the signal compensation unit were considered missing in the former claim 1, which was deemed to constitute an intermediate generalization (see points 3 to 3.3 of the Reasons).

- 1.2 With the grounds of appeal the appellant filed a new sole request with an amended set of claims. The appellant cited as the basis for the amendments Figures 5 and 6 and the corresponding part of the description of the application, namely paragraphs [0050] to [0054] of the A2-publication, which corresponds to the passage on page 14, line 1 to page 15, line 16 of the description of the application as filed.
- 1.3 The amendments of the claims, in particular of claim 1, address the objections in the decision mentioned under point 1.1 above. However, the board considers that the present claim 1 still contains added subject-matter for other reasons which will be set out hereafter.
 - 1.3.1 The timing controller 201 described in the description of the application (see in particular page 13, line 19 - page 15, line 16) in relation to Figures 5 and 6, which was referred to by the appellant as a basis for the amendments in claim 1, uses a signal conversion unit 211, a memory 220, a signal compensation unit 241, and a signal correction unit 231 for generating a corrected image signal DATn'.
 - 1.3.2 In particular, in concrete terms with reference to the three consecutive time frames 1, 2, and 3 shown in Figure 6, when a second gray level G2 of a second primitive image signal DAT2 is lower than a first gray level G1 of a first converted image signal tDAT1, the signal conversion unit 211 converts the second primitive image signal DAT2 into the second converted image signal tDAT2 having a third gray level G3 higher than the second gray level G2 (page 14, lines 1-13 and 21-25). It is to be noted that in the description (see page 14, lines 1-13) of this conversion using references to time

frames in general terms, the "previous"/"n-1" time frame and the "current"/"n" time frame correspond to the *first time frame* and the *second time frame* in Figure 6, respectively.

- 1.3.3 Furthermore, when the fourth gray level G4 of the third primitive image signal DAT3 is lower than the third gray level G3 of the second converted image signal tDAT2, the signal compensation unit 241 generates a second compensated image signal ttDAT2 having a fifth gray level G5 lower than the third gray level G3 (page 14, lines 14-20 and 25-28). Here, by contrast to the conversion mentioned above, in the description (see page 14, lines 14-20) of the compensation using references to time frames in general terms, the "previous"/"n-1" time frame and the "current"/"n" time frame correspond to the *second time frame* and the *third time frame* in Figure 6, respectively.
- 1.3.4 Finally, a third corrected image signal DAT3' is generated by correcting the third primitive image signal DAT3 based on the second compensated image signal ttDAT2 (page 14, lines 28-31).
- 1.3.5 In summary, three consecutive time frames (e. g. the first, second, and third time frames) are needed in order to specify the working of the relevant timing controller 201. In particular, the generation of the third corrected image signal DAT3' of the third time frame requires information from the first, second, and third time frames, namely in relation to tDAT1, DAT2, tDAT2, ttDAT2, and DAT3.

In view of the above it is evident that the fact that in the description of the working of the timing controller 201 using references to time frames in

general terms, only two frames ("previous"/"n-1" and "current"/"n") are mentioned has no technical significance and is due to an implied jump of one time frame forward between the description of the signal conversion on page 14, lines 1-13, and the description of the signal compensation on page 14, lines 14-20.

- 1.3.6 By contrast to what has been disclosed in the description of the application, in claim 1 of the sole request the timing controller is defined using references to signals of only two consecutive ("current" and "previous") time frames, namely the "current primitive image signal", "current converted image signal", "previous converted image signal", and "previous compensated image signal". Moreover, there is no indication in claim 1 that "current" or "previous" does *not* have the same meaning throughout the claim, in particular no jump in the time frame is specified. However, in this manner a timing controller is claimed having different characteristics than the timing controller described under points 1.3.1 to 1.3.5 above which has been disclosed in the description of the application.
- 1.3.7 Therefore, claim 1 of the sole request contains subject-matter extending beyond the content of the application as filed, contrary to the requirements of Article 123(2) EPC. Consequently, the appeal has to be dismissed.

Order

For these reasons it is decided that:

The appeal is dismissed.

The Registrar:

The Chairman:



S. Sánchez Chiquero

G. Eliasson

Decision electronically authenticated