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**Datasheet for the decision
of 11 July 2019**

Case Number: T 1503/15 - 3.4.03

Application Number: 09013105.3

Publication Number: 2237260

IPC: G09G3/36, G09G3/34

Language of the proceedings: EN

Title of invention:

Liquid crystal display and driving method thereof

Applicant:

LG Display Co., Ltd.

Headword:

Relevant legal provisions:

EPC Art. 123(2)

EPC R. 115(2)

RPBA Art. 15

Keyword:

Amendments - added subject-matter (yes)

Decisions cited:

Catchword:



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Case Number: T 1503/15 - 3.4.03

D E C I S I O N
of Technical Board of Appeal 3.4.03
of 11 July 2019

Appellant: LG Display Co., Ltd.
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Decision under appeal: Decision of the Examining Division of the
European Patent Office posted on 10 March 2015
refusing European patent application No.
09013105.3 pursuant to Article 97(2) EPC.

Composition of the Board:

Chairman G. Eliasson
Members: S. Ward
G. Decker

Summary of Facts and Submissions

- I. The appeal is against the decision of the Examining Division refusing European patent application No. 09 013 105 on the grounds that the claimed subject-matter did not involve an inventive step within the meaning of Article 56 EPC (main request), and did not meet the requirements of Article 123(2) EPC (first and second auxiliary requests).
- II. The appellant requested in writing that the decision under appeal be set aside and that a patent be granted on the basis of claims 1 to 7 as filed with the statement of grounds of appeal.
- III. Oral proceedings before the Board were held in the absence of the appellant, the appellant having previously stated in writing: "We will not attend the Oral Proceedings ... It is requested to make a decision based on the status of the file."
- IV. Claim 1 (including the references (a)-(h) used in the statement of grounds of appeal) reads as follows:

*"A liquid crystal display comprising:
a liquid crystal display panel (10), which displays a picture;
a backlight unit including
a light guide plate part (20) in which first light guide channels (201a, ..., 201f) of a first direction and second light guide channels (202a, ..., 202d) of a second direction intersected with the first direction are formed,*

a first light array (23A, 23B) for illuminating light to the first light guide channels (201a, ..., 201f), and
a second light array (24A, 24B) for illuminating light to the second light guide channels (202a, ..., 202d), respectively,
wherein blocks (B11~ B46) are defined by intersection of a plurality of first line blocks in parallel with one another in the first direction corresponding to the first light guide channels (201a,... 201f) and a plurality of second line blocks in parallel with one another in the second direction corresponding to the second light guide channels (202a, ..., 202d); and
a dimming controller (16) for
(a) obtaining final target luminance values (FTL; A, B, ..., X) for each of the blocks (B11~B46) by mapping input digital picture data to the blocks (B11~B46), and analyzing luminance of the input digital picture data being mapped to each of the blocks (B11~B46),
(b) obtaining first maximum luminance values (ML1) for each of the plurality of first line blocks (B11~B16, B21~B26, B31~B36, B41~B46) from the final target luminance values (FTL; A~X) by comparing the final target luminance values (FTL; A~X) of the plurality of first blocks (B11~B16, B21~B26, B31~B36, B41~B46) neighboring in the first direction,
(c) determining first dimming values (D1; L7~L10) for each of the plurality of first line blocks (B11~B16, B21~B26, B31~B36, B41~B46) from a first lookup table storing dimming values corresponding to the first maximum luminance values (ML1) to independently control luminance of light sources of the first light array (23; 23A, 23B),
(d) obtaining intermediate target luminance values (MTL; A'~X') for each of the blocks (B11~B46) by

subtracting the first maximum luminance value (ML1) from the final target luminance values (FTL; A-X),
(e) obtaining second maximum luminance values (ML2) from the intermediate target luminance values (MTL; A'~X') by comparing the intermediate target luminance values (MTL; A'~X') of blocks (B11~B41, B12~B42, B13~B43, B14~B44, B15~B45, B16~B46) neighboring in the second direction,
(f) determining second dimming values (D2; L1~L6) for each of the plurality of second line blocks (B11~B41, B12~B42, B13~B43, B14~B44, B15~B45, B16~B46) from a second lookup table storing dimming values corresponding to the second maximum luminance values (ML2) for independently controlling luminance of light sources of the second light array (202a, ..., 202d)
(g) adjusting the first and second dimming values (D1, D2) so that a luminance difference between neighboring blocks caused by the first and second dimming values (D1, D2) is a predetermined threshold luminance value or less, and
(h) lowering an entire luminance of a display screen by an amount of luminance increased by the adjustment of the first and second dimming values (D1, D2)."

Claim 5 is an independent method claim comprising features essentially corresponding to those of claim 1.

- V. With the summons to oral proceedings, the Board sent the appellant a communication under Article 15(1) RPBA setting out its provisional views. The Board expressed doubts whether claims 1 and 5 complied with the requirements of Article 123(2) EPC, and questioned whether the requirements of Article 83 and/or Article 84 EPC were met. Inventive step was also briefly discussed.

VI. The appellant's arguments, insofar as they are relevant to the present decision, may be summarised as follows:

Feature (a) of claim 1 was taken from paragraph [0045], lines 1 to 4, and also from paragraph [0047]; features (b) and (c) were taken from paragraph [0048]; feature (d) was derived from paragraph [0049]; features (e) and (f) were based on paragraph [0050]; and the last two features (g) and (h) could be taken from paragraph [0052].

Claim 1 now clearly defined the functional features of the dimming controller, and how it controlled the first and second light arrays so as to improve picture quality and dynamic and static contrast properties, while simultaneously reducing power consumption.

The same arguments applied to claim 5 *mutatis mutandis*.

Reasons for the Decision

1. The appeal is admissible.

As announced in advance, the duly summoned appellant did not attend the oral proceedings. According to Rule 115(2) EPC, if a party duly summoned to oral proceedings does not appear as summoned, the proceedings may nevertheless continue, the party then being treated as relying only on its written case. As the present case was ready for decision at the conclusion of the oral proceedings (Article 15(5) and (6) RPBA), the voluntary absence of the appellant was not a reason for delaying the decision (Article 15(3) RPBA).

2. *Article 123(2) EPC*

2.1 Claim 1, up to the feature "a dimming controller (16) for", is based on the combination of claims 1 and 3 as originally filed. As basis for the subsequent features (referred to as features (a) to (h) in the statement of grounds of appeal), the appellant cites paragraphs [0045], [0047], [0048], [0049], [0050], and [0052]). Hence, essentially all of the functional features (a) to (h) by which the dimming controller is defined are derived from the description and drawings.

Incorporating into an independent claim features disclosed in passages of the description raises the question whether other features are disclosed in the cited passages which have not been imported into the claim, and if so, whether this omission is compliant with the requirements of Article 123(2) EPC.

2.2 In the present case, an aspect of the operation of the dimming controller is described in the penultimate sentence of paragraph [0045] as follows:

"The dimming controller 16 is also synchronized with the timing controller 11 by the timing signals Vsync, Hsync, DE and DCLK to synchronize the driving timing of the first and second light arrays 23 and 24 with the displaying timing of the digital picture data RGB."

The timing controller 11 is first defined in paragraph [0031] "for controlling the data driving part 12 and the gate driving part 13".

2.3 Paragraph [0045] therefore defines that the dimming controller, and hence the operation of the first and

second light arrays, is synchronized with the timing controller, and hence with the data driving and gate scan cycles of the display panel.

The disclosed mutual synchronization between the dimming controller (controlling the illumination levels) and the timing controller (controlling the data display cycles) is a technical feature which is clearly essential to achieving the stated aim of "implementing a local dimming" (paragraph [0001]), and the omission of this feature from claim 1 results in subject-matter which does not have a basis in the application as originally filed, contrary to the requirements of Article 123(2) EPC.

2.4 Moreover, the synchronization between the dimming controller and the timing controller is "to synchronize the driving timing of the first and second light arrays 23 and 24 with the displaying timing of the digital picture data RGB." According to the description and drawings, this involves the timing controller "controlling the data driving part 12 and the gate driving part 13" (paragraph [0031]) and the dimming controller "controlling the first and second light array driving parts 21 and 22" (paragraphs [0031], [0045]).

Hence, the omission of the data driving part 12, the gate driving part 13 and the first and second light array driving parts 21 and 22 is also contrary to the requirements of Article 123(2) EPC.

2.5 Independent method claim 5 essentially recites features corresponding to those in device claim 1, and hence the points raised above in relation to claim 1 apply to claim 5 also.

- 2.6 Moreover, claim 5 comprises steps (a)-(h), but without defining that they are carried out by a dimming controller (in fact no dimming controller is mentioned in the claim). However, the first lines of all of the paragraphs cited by the appellant as basis for these features (paragraphs [0045], [0047], [0048], [0049], [0050] and [0052]) refer to the "dimming controller" carrying out the described operations. Since the description unambiguously discloses that steps (a)-(h) are carried out under the control of the dimming controller 16, the omission of this feature from claim 5 is contrary to the requirements of Article 123(2) EPC.
3. The subject-matter of the sole request has been found not to comply with the requirements of Article 123(2) EPC. Consequently it is unnecessary to discuss the provisional objections raised in the Board's communication in relation to the requirements of Articles 83 and 84 EPC.

Order

For these reasons it is decided that:

The appeal is dismissed.

The Registrar:

The Chairman:



S. Sánchez Chiquero

G. Eliasson

Decision electronically authenticated