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D E C I S I O N
of 31 May 2006

Case Number: T 1149/04 - 3.4.03

Application Number: 01915834.4

Publication Number: 1211662

IPC: G09G 3/20

Language of the proceedings: EN

Title of invention:
Display, method for driving the same, and portable terminal

Applicant:
SONY CORPORATION

Opponent:
-

Headword:
-

Relevant legal provisions:
EPC Art. 56

Keyword:
"Inventive step: yes"

Decisions cited:
-

Catchword:
-

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Beschwerdekammern | Boards of Appeal | Chambres de recours

Case Number: T 1149/04 - 3.4.03

D E C I S I O N
of the Technical Board of Appeal 3.4.03
of 31 May 2006

Appellant: SONY CORPORATION
7-35 Kitashinagawa 6-chome
Shinagawa-ku
Tokyo 141-0001 (JP)

Representative: Thévenet, Jean-Bruno
Cabinet Beau de Loménie
158, rue de l'Université
F-75340 Paris Cédex 07 (FR)

Decision under appeal: **Decision of the Examining Division of the European Patent Office posted 27 April 2004 refusing European application No. 01915834.4 pursuant to Article 97(1) EPC.**

Composition of the Board:

Chairman: R. G. O'Connell
Members: V. L. P. Frank
P. Mühlens

Summary of Facts and Submissions

I. This is an appeal from the refusal of European patent application 01 915 834.4 for lack of inventive step (Article 56 EPC).

II. In response to a communication from the board the appellant filed amended claims and description.

The independent claims are now worded as follows:

"1. A display device for making regular image display in a partial area in the direction of row in a display area (51) having pixels arranged in the form of a matrix and for making specified color display in the remaining area, the display device comprising:
storage means (523, 533) for storing data of one horizontal line as display data at each pixel in the display area (11); and
storage control means (55, 56) for controlling the storage means (523, 533) so as to repeatedly carry out, by each line, the operation to write the data of one horizontal line to the storage means during a first display period for making the regular image display, and so as to write the data of one horizontal line at the beginning of a second display period for making the specified color display and then repeatedly read out the data written in the storage means during the display period,
characterized in that said display device further comprises level converting means (551, 561) for converting the level of a control signal provided

from the storage control means (55, 56) to the storage means, and
control means (57) for carrying out control so as to stop the operation of the level converting means except for the first display period and the display period for the first line within the second display period, and in that display device further comprises latch means (552, 562) for latching a control signal provided from the storage control means (55, 56) to the storage means, and
control means (57) for carrying out control so as to cause the latch means to latch a value for stopping the rewrite operation of the storage means as the control signal except for the first display period and the display period for the first line within the second display period."

"6. A method for driving a display device which has storage means (523, 533) for storing data of one horizontal line and which is adapted for making regular image display in a partial area in the direction of row on the basis of the data of one horizontal line stored in the storage means, in a display area (51) having pixels arranged in the form of a matrix, and for making specified color display in the remaining area, the method comprising the steps of:

repeatedly carrying out the operation to write the data of one horizontal line to the storage means by each line during a display period for making the regular image display; and

writing the data of one horizontal line to the storage means at the beginning of a display period for making the specified color display and then repeatedly reading out the data written in the storage means during the display period, characterized in that the display device further comprises level converting means (551, 561) for converting the level of a control signal provided to the storage means, and control means (57) for carrying out control so as to stop the operation of the level converting means except for the rewrite period of the storage means, and in that said display device further comprises latch means (552, 562) for latching a control signal to the storage means, said method further comprising a step of causing the latch means to latch a value for stopping the rewrite operation of the storage means as the control signal except for the rewrite period of the storage means."

III. The following prior art documents were cited in the examination procedure:

D1: EP 0 974 952 A

D2: US 5 726 676 A

D3: Patent Abstracts of Japan, vol. 1998, no. 9, 31 July 1998 & JP 10 096958 A

D4: Patent Abstracts of Japan, vol. 1999, no. 12, 29 October 1999 & JP 11 184434 A

A computer generated translation of document D4 (obtained online from the Industrial Property Digital Library of Japan, http://www4.ipdl.ncipi.go.jp/Tokujitu/tjsogodbenk.ipdl) was sent to the applicant as an annex to the communication of the board.

IV. The reasoning of the examining division in the decision under appeal insofar as it is relevant to the present case was essentially as follows:

– A display device with the features of the preamble of claim 1 was known from document D1. The technical problem addressed by the provision of level converting means which were stopped during the non-display period was to enable a display device to receive signals from external control circuits with a low operating voltage and to save power. The provision of level converting means was however a common design option as exemplified by documents D2 and D3. The skilled person would therefore implement such circuits between the controller and the driver of the display device in the manner specified in claim 1 (point 1 of the reasons).

– The technical problem addressed by the further provision of latch means for latching a control signal to stop the rewrite operation of the storage means during the non-display period can be seen in enabling a device user to set freely a partial display area, in particular, as the application itself does not disclose a clear teaching as to which technical problem is addressed by these features (point 2.3 of the reasons). How to realize

a high versatility partial display was however already disclosed in document D4.

– The skilled person would combine the teaching of document D1 with his general knowledge (as illustrated by documents D2 and D3) to solve the first problem and the teachings of documents D1 and D4 to solve the second problem, which was not related to the first problem, and would thus arrive at a display device according to claim 1.

The method of claim 6 was found not to be inventive essentially for the same reasons.

Although it is stated in the appealed decision that an unofficial translation of document D4 was provided for the convenience of the applicant (cf end of point 2 of the facts and submissions), there is neither a copy of this translation present in the file nor was the source of this translation identified.

V. The appellant argued essentially as follows:

– Document D1 discloses a display device with the features of the preamble of claim 1.

– Documents D2 and D3 on the other hand disclose the use of level shifters in a display device as means for saving power by allowing part of the liquid crystal display to operate at a lower voltage than the analogue outputs or as means enabling receipt of signals from external control circuits with a low operating voltage. However, these documents do not relate to a display device having a partial screen

display mode and, therefore, do not deal with the control of the level shifters during a non-display period. None of documents D1 to D3 discloses or suggests providing additional means for controlling the operation of these level shifters in order to further reduce the power consumption.

– The examining division further considered that, since document D4 described a liquid crystal display device having a partial screen display mode with high versatility wherein data of one horizontal line are stored in a register and the register causes a circuit to provide a low signal if the line does not contain pixels of the partial display area, and a high signal if the line contains pixels of the partial display area, the man skilled in the art would arrive directly at the latch means and their control means as defined in the independent claims. This argument appeared somewhat obscure because it was difficult to determine what elements in D4 could be compared to the further latch means and the control means defined in the independent claims. In particular, it could not be seen which components in D4 could be compared to the control means defined in the claims which carry out control so as to cause the latch means to latch a value for stopping the rewrite operation of the storage means as the control signal except for the rewrite period of the storage. Without a teaching in document D4 relating to such specific control means, the skilled person could not arrive at the subject-matter of the independent claims.

– The level shifting circuits and the additional latch means receive the control signal provided from the storage control means and both play a part in the control of the storage means with a view to reducing power consumption, ie both participate together to solve a common problem.

VI. The appellant requests that the decision under appeal be set aside and that a patent be granted with the following documents:

Claims: 1 to 7, as filed with letter of 3 May 2006

Description: pages 1, 6, 7, 10, 13, 14, 15, 18, 21, 23 to 25, 30 to 32, 35 to 40, as originally filed
page 2, as filed with letter of 19 August 2003
pages 3 to 5, 8, 9, 11, 12, 16, 17, 19, 20, 22, 26 to 29, 33, 34, as filed with letter of 3 May 2006

Drawings: Figures 1 to 13, as originally filed.

Reasons for the Decision

1. The appeal is admissible.

2. *Amendments (Article 123(2) EPC)*

Independent claims 1 and 6 are based on the combination of claims 1, 4 and 5 and claims 12, 4 and 5 as

originally filed, respectively. The description has been amended to acknowledge the relevant state of the art and adapted to the claims.

The board is therefore satisfied that Article 123(2) EPC is not contravened.

3. *Inventive step (Article 56 EPC)*

The only remaining issue in this appeal is that of inventive step.

3.1 The application relates to a display device which can be used eg in a portable telephone. Such displays are usually made of a liquid crystal or an electroluminescent material, since their power consumption is low. In the stand-by mode not the whole display is actively used, but only a part of it to indicate that the device is switched on and is in this mode. This display mode is referred in the application as the partial screen display mode. However, even in this mode the display device must carry out a refresh operation using a certain image signal, not only in the display area but also in the non-display area. It is therefore the aim of the invention to reduce the power consumption during the stand-by mode (pages 1 and 2).

3.2 It is undisputed that document D1 discloses a display device allowing a partial screen display mode with the features of the preamble of claim 1 (point 1.1 of the reasons of the decision under appeal).

3.3 The display device of claim 1 differs from the display device disclosed in document D1 in that:

(a) level converting means are provided for converting the level of a control signal provided from the storage control means to the storage means,

(b) control means are provided for carrying out control so as to stop the operation of the level converting means except for the first display period and the display period for the first line within the second display period (ie the non-display period),

(c) latch means are provided for latching a control signal provided from the storage control means to the storage means, and

(d) control means are provided for carrying out control so as to cause the latch means to latch a value for stopping the rewrite operation of the storage means as the control signal except for the first display period and the display period for the first line within the second display period.

3.4 According to the application the provision of the level shifting and latch circuits together with the control of both so that the level shifting circuits and the rewrite operation of the latch circuits is stopped during the non-display period reduces the power consumption of the display device. The objective technical problem addressed by the invention of claim 1 is thus the same as the one stated in the application as filed, namely to reduce the power consumption of the display device (page 2, line 27 to page 3, line 2; page 26, 3rd paragraph; page 39, 3rd paragraph; page 40, lines 5 to 7).

3.5 Document D2 discloses the use of level shifting circuits in a display device for reducing the power consumption (abstract, 2nd sentence and column 1, lines 42 to 65).

3.6 On the other hand, document D1 discloses that many components of the display device such as the controller, the driving-voltage forming circuit, the X-driver and the Y-driver can be suspended during the non-display line access period in the partial display state. This allows notable reduction of power consumption by the driving circuit (D1, [0166]). This non-exhaustive list of components prompts the skilled person, in the view of the board, to evaluate and decide which components of the display device can and should be switched off during the non-display state. This evaluation is also required in the event that level shifting circuits according to document D2 are incorporated into the display device disclosed in D1. In particular, as both documents are concerned with the same technical problem, ie to reduce the power consumed by the display device.

3.7 As mentioned above (cf the end of point IV) the unofficial translation of document D4 mentioned in the decision under appeal is neither identified nor present in the file. According to the English abstract of document D4 the object of this invention is to allow the free determination of the partial display area, so that any area of the display can be used for indicating the stand-by mode (Fig 1A to 1D). The solution is given by registers in the control circuit in which the row and column limiting values (L1, L2, M1 and M2) are stored. The abstract itself however does not provide

any further information nor does it disclose any reduction of power consumption.

3.8 The board tried to interpret document D4 with the aid of a computer generated translation, a service provided freely by the Industrial Property Digital Library of Japan. Such computer generated translations are however of little help when trying to understand in detail the operation of an electronic circuit. In particular, it cannot be discerned from the passages of this translation referred to by the examining division (ie sections [0016] to [0018] and [0026] to [0049]) whether the control means cause the latch circuits to stop the rewrite operation of the storage means during the non-display period except for the first line of this period.

3.9 As there is no unambiguous disclosure of features (c) and (d) in the prior art and, in particular, in document D4, the board has to conclude that the display device of claim 1 is not rendered obvious by the state of the art on file. The same conclusion applies to the method for driving a display device of claim 6, since it involves the same device features as claim 1.

4. The board judges, for these reasons, that the application fulfils the requirements of the EPC.

5. *Observation*

5.1 According to the decision under appeal a copy of an unofficial translation of document D4 was provided to the applicant (cf end of point 2 of the facts and submissions). There is however neither a copy of any translation of document D4 present in the file nor is

the source of this translation identified in the decision under appeal or the previous communications.

5.2 The board has already stressed in the past that the correct and complete maintenance of the files is one of the main duties of the EPO to assure the transparency of the proceedings before it. This is on the one hand necessary so that the boards of appeal may examine an appeal filed against an adverse decision (Article 110(1) EPC) and on the other so that the public in general is kept informed as to the course of the proceedings.

5.3 The board has found a workaround in the present case, but it is clearly less than ideal that the board should be deprived of the actual basis for the first instance department's interpretation of a prior art document. In the circumstances the appellant applicant has to be given the benefit of the residual doubt as to whether the examining division's translation was significantly different from the one obtained by the board.

Order

For these reasons it is decided that:

1. The decision under appeal is set aside.

2. The case is remitted to the department of first instance with the order to grant a patent with the following documents:

Claims: 1 to 7, as filed with letter of 3 May 2006

Description: pages 1, 6, 7, 10, 13, 14, 15, 18, 21, 23 to 25, 30 to 32, 35 to 40, as originally filed
page 2, as filed with letter of 19 August 2003
pages 3 to 5, 8, 9, 11, 12, 16, 17, 19, 20, 22, 26 to 29, 33, 34, as filed with letter of 3 May 2006

Drawings: Figures 1 to 13, as originally filed.

Registrar Chair

S. Sánchez Chiquero R. G. O'Connell