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File Number: T 692/91 - 3.4.1

Application No.: 84 402 511.4

Publication No.: 0 149 381

Title of invention: Method for driving a gas discharge display panel

Classification: G09G 3/28

D E C I S I O N
of 2 March 1993

Applicant: FUJITSU LIMITED

Headword:

EPC Articles 56 and 111(1)

Keyword: "Inventive step (no, in respect of Claims 1 to 5)"
"Remittal of the case to the first instance for examination of a
new auxiliary request"



Case Number : T 692/91 - 3.4.1

D E C I S I O N
of the Technical Board of Appeal 3.4.1
of 2 March 1993

Appellant : FUJITSU LIMITED
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Representative : D. LEVESQUE
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Decision under appeal : Decision of the Examining Division 063 of the
European Patent Office dated 2 May 1991 refusing
European patent application No. 84 402 511.4
pursuant to Article 97(1) EPC.

Composition of the Board :

Chairman : G.D. Paterson
Members : Y. van Henden
U. Himmler

Summary of Facts and Submissions

- I. European patent application No. 84 402 511.4 (publication No. 0 149 381) concerning a method for driving a gas discharge display panel was refused by decision of the Examining Division.

The reasons given for the refusal were that the new Claim 1 submitted with Applicant's letter of 12 March 1990 could not be considered as exclusively adapted for driving display panels of the kind referred to in the preamble of said claim, and that, with regard to the state of the art disclosed in document

D1: US-A-4 011 558,

providing the method steps explicitly mentioned in the claim did not require the exercise of inventive ingenuity.

- II. The Applicant lodged an appeal against the decision of the Examining Division.
- III. With his Statement of Grounds of Appeal, the Appellant filed a new set of claims numbered 1 to 8. Claim 1 of this set reads:

"Method exclusively adapted for driving a discharge display panel comprising a set of X display electrodes ($X_1 - X_n$) and a set of Y display electrodes ($5_a - 5_{m \times m'}$) arranged to form a dot matrix of discharge points having $m \times m'$ lines and n columns, wherein the Y display electrodes

(5_a - 5_{mXm'}) are driven by first driving electrodes (7_a - 7_{mXm'}) and second driving electrodes (7'_a - 7'_{mXm'}), a respective one of first driving electrodes (7_a - 7_{mXm'}) and a respective one of second driving electrodes (7'_a - 7'_{mXm'}) being capacitively coupled by condensers (6_a - 6_{mXm'}, 6'_a - 6'_{mXm'}) to a corresponding Y display electrode (5_a - 5_{mXm'}) on at least one of two substrates, said first driving electrodes being connected so as to form first driving electrode groups (7_a, 7_b, ..., 7_{m'}; 7_{m' + 1}, 7_{m' + 2}, ..., 7_{2m'}; ...) and said second driving electrodes being connected so as to form second driving electrode groups (7'_a, 7'_{m' + 1}, ..., 7'_{(m - 1)m' + 1}; 7'_b, 7'_{m' + 2}, ..., 7'_{(m - 1)m' + 2}, ...) wherein specified Y display electrodes are controlled by selecting corresponding first and second driving electrodes at a same time, characterized in that it comprises:

- a first step for discharging all display dots in selected one line of the Y display electrodes (5_a - 5_{mXm'}) which are to be written; and
- a second step for erasing the display dots which are not to be written."

Claims 2 to 5 are appended to Claim 1 and identical to those of the set which was refused by the Examining Division. Claims 6 to 8 are independent method claims having the same pre-characterising part as Claim 1. The characterising part of Claim 6 reads:

"characterized in that it comprises a first step of applying a reference voltage to all X display electrodes (X₁-X_n), applying a sustain voltage pulse (Vs) and a write voltage pulse (Vw) to one of said first driving electrode groups (7_a - 7_{mXm'}) and said second driving electrode groups (7'_a-7'_{mXm'}) to present a write voltage only at the display electrode to which a write voltage is applied, so

that all display dots in a selected one line of display electrodes ($5_a - 5_{m \times m'}$) to be written are lit; a second step of applying an erase signal pulse (VE) to said selected display electrode and applying an erase cancel pulse (Vc) to opposed electrodes ($X_1 - X_n$) at the same timing as said erase pulse (VE) so that an erasing operation is cancelled at the dot to be written."

The characterising part of Claim 7 comprises a first clause reading

"characterized in that it comprises a first step of applying a write pulse (Vw) to all X display electrodes ($X_1 - X_n$), applying a sustain voltage pulse (Vs) and a reference voltage to one of said first driving electrode groups ($7_a - 7_{m \times m'}$) and said second driving electrode groups ($7'_a - 7'_{m \times m'}$), to present a reference voltage only at the electrode to which a reference voltage is applied, so that all display dots in a selected one line of display electrodes ($5_a - 5_{m \times m'}$) to be written are lit;"

and a second clause identical to that of Claim 6. Claim 8 differs from Claim 7 in that the second clause of its characterising part reads:

"a second step of applying an erase signal pulse (VE) to said selected display electrodes ($X_1 - X_n$), and applying the same voltage pulse as in said first step to said first driving electrode groups ($7_a - 7_{m \times m'}$) and said second driving electrode groups ($7'_a - 7'_{m \times m'}$)."

IV. The Appellant requests that the decision under appeal be cancelled and that a European patent be granted on the basis of the following documents:

Description: pages 1, 2, 5 and 7 to 14 as originally filed; pages 6 and 6a filed on 5 February 1990, the text on page 6a having to be inserted in the place of the sentence which, in page 6 as originally filed, extended from line 19 to line 21; pages 3 and 4 filed on 1 September 1990; page 3a submitted with the Statement of Grounds of Appeal;

Claims: 1 to 8 submitted with the Statement of Grounds of Appeal;

Drawings: sheets 1/7, 2/7 and 4/7 to 7/7 as originally filed; sheet 3/7 filed on 1 September 1990.

V. In support of his requests, the Appellant argues substantially as follows:

The claimed method is intended to solve problems specific to AC display panels, in particular the appearance of a semi-selection voltage in the lines adjacent to selected ones of a panel multiplexed by capacitive couplings. The inventors found that such drawbacks were overcome by lighting all dots in one line and subsequently extinguishing the unnecessary dots. This idea could not be easily derived from document (D1), since the latter pertains to a DC gas discharge panel, i.e. a panel which is not subject to the above-mentioned deficiency.

As a matter of fact, the Examining Division did not interpret Claim 1 as being limited by both its characterising part and its pre-characterising part. Accordingly, instead of considering the claimed method as exclusively applicable to the apparatus defined in the pre-characterising part of Claim 1, they took the view that it was merely suitable for that purpose and,

therefore, that it could validly be challenged by a prior art method for driving a DC display panel. Nevertheless, they admitted that Claim 1 would be allowable if it were suitably amended in view of the preceding. Taking this into account, Claim 1 now states that protection is sought for a method which is exclusively adapted for driving a panel such as defined in its pre-characterising part.

Reasons for the Decision

1. Claim 1 as submitted with the Statement of Grounds of Appeal differs from that on which the impugned decision is based in that "exclusively adapted" has been inserted between "Method" and "for driving a discharge display panel", in that the reference sign $[7'(m - 1)m + 1]$ was corrected to read $(7'(m - 1)m' + 1]$ and in that a few additional reference signs appear.

Rule 29(7) EPC states that reference signs shall not be construed as limiting a claim. Amendments concerning such signs thus do not request any further substantive examination. Now, stating that the claimed method is exclusively adapted for driving a display panel of the kind referred to in the preamble of Claim 1 may, at the utmost, be interpreted as implying an inadequacy of said method for driving other kinds of display panels. This entails in turn that, if a method including the steps explicitly mentioned in Claim 1 appears to be also suitable for driving discharge display panels of such another kind, a requirement to be met in order that the claimed method be nonetheless novel would be that the mention of its suitability for driving display panels of the type referred to in said claim, exclusively, could be interpreted as involving some implicit technical teaching. The application as filed, however, does not disclose

anything that could support this view, which the Appellant actually neither put forward unambiguously nor substantiated in any way. Consequently, neither does the insertion of the clause "exclusively adapted" in Claim 1 represent an alteration of the claimed protection that would require further substantive examination.

In the Board's judgment, therefore, the subject-matter of Claim 1 as filed with the Statement of Grounds of Appeal is identical to that of the claim on which the impugned decision is based.

2. Interpretation of Claim 1

It appears from the description that the so-called "first driving electrodes (7_a - 7_{mxm'})" and "second driving electrodes (7'_a - 7'_{mxm'})" mentioned in the preamble of Claim 1 are merely conductors connecting the terminals of the driving circuits (16, 17) to the capacitors (6_a - 6_{mxm'}; 6'_a - 6'_{mxm'}) connected to the extremities of the Y display electrodes (5_a - 5_{mxm'}).

In the characterising part of the claim, the step of discharging all display dots in a selected line has to be interpreted as meaning that all said dots are made to light up - see page 2, lines 1 to 5.

3. State of the art

Document (D1) discloses a method of driving a gas discharge display panel. According to said method, when characters are to be written, a write pulse ignites all cells in all of the cell rows that pertain to the first line of characters - see column 5, lines 28 to 36. Subsequently, erase pulses are applied in order to extinguish column-by-column the unwanted cells of the

first line of characters - see column 5, lines 63 to 66 and column 6, lines 8 to 11. Both operations are then repeated as many times as there are additional lines of characters to be written - see column 6, lines 11 to 21.

The invention covered by Claim 1 is distinguished over the prior art known from (D1) in that the pattern to be displayed is written line by line and in that the line electrodes ($5_a - 5_{m \times m}$) of the display panel are capacitively coupled to the drivers outputting the write and erase pulses.

4. Inventive step

The Board shares the opinion of the Examining Division that, to a person skilled in the art, it is obvious to carry out the steps of the method disclosed in (D1) taking only one dot line at a time instead of a plurality of dot lines forming one line of characters, and that said method disclosed in (D1) can also be applied to the kind of panels envisaged in the application. Concerning this latter point, it should in particular be noted that, according to document (D1), writing or erasing a cell is performed by applying to selected electrodes a voltage pulse which brings the voltage across the cell to a value above or below the maintain voltage, respectively - see column 1, lines 46 to 52 and column 2, lines 36 to 39. Yet, the skilled person knows that, being of very short duration, such voltage pulses can be applied through capacitors as well. Therefore, he would by no means be deterred from envisaging to use the method known from (D1) for driving an AC gas discharge display panel of the kind referred to in the preamble of Claim 1. The Appellant's arguments do not invalidate this view.

In the Board's judgment, therefore, Claim 1 lacks an inventive step.

5. Claim 1 is not allowable - Article 52(1) EPC in conjunction with Article 56 EPC.

Claims 2 to 5 fall because of their dependency on Claim 1.

6. The subject-matter of independent Claims 6 to 8 was not considered with respect to patentability in the previous stages of the proceedings. In order to give the Appellant the opportunity to take advantage of the two instances, the Board, in exercise of its power under Article 111(1) EPC, consequently decides to remit the case to the first instance for further examination in respect of these claims to be considered as the basis of an auxiliary request.

Order

For these reasons, it is decided that:

1. The decision under appeal is set aside.
2. Claims 1 to 5 as filed with the Statement of Grounds of Appeal are refused.
3. The case is remitted to the Examining Division for further prosecution on the basis of Claims 6 to 8 as filed with the Statement of Grounds of Appeal.

The Registrar:

The Chairman:

M. Beer

G.D. Paterson