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Aktenzeichen / Case Number / N° du recours : T 50/83 - 3.5.1

Anmeldenummer / Filing No / N° de la demande : 79 301 138.8

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Bezeichnung der Erfindung: Method of processing image data
Title of invention:
Titre de l'invention :

Klassifikation / Classification / Classement : H04N 1/00, H04N 1/26, H04N 1/40

ENTSCHEIDUNG / DECISION

vom / of / du 29 March 1989

Anmelder / Applicant / Demandeur :

Patentinhaber / Proprietor of the patent / Titulaire du brevet : XEROX CORPORATION
Xerox Square
Rochester, New York (US)

Einsprechender / Opponent / Opposant :

Stichwort / Headword / Référence :

EPÜ / EPC / CBE Article 56

Schlagwort / Keyword / Mot clé : "Inventive step (yes)"

Leitsatz / Headnote / Sommaire

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Case Number : T 50/83 - 3.5.1

D E C I S I O N
of the Technical Board of Appeal 3.5.1
of 29 March 1989

Appellant : XEROX CORPORATION
Xerox Square
Rochester, New York (US)

Representative : Goode, Ian Roy
Rank Xerox Limited
Patent Department
364 Euston Road
London NW1 3BL (UK)

Decision under appeal : Decision of Examining Division 058 of the European Patent Office dated 6 September 1982 refusing European patent application No. 79 301 138.8 pursuant to Article 97(1) EPC.

Composition of the Board :

Chairman : P.K.J. van den Berg
Members : Y.J.F. van Henden
P. Ford

Summary of Facts and Submissions

I. The European patent application No. 79 301 138.8 (publication number 0 006 351) was refused by decision of the Examining Division, dated 6 September 1982.

II. The reason for the decision was that, having regard to the state of the art disclosed in US-A-4 068 266, the novelty of the claimed method was limited to its being operated on a block by block basis and that such was also the case for the particular example described in the cited document with reference to Figure 2. No inventive step, therefore, could be perceived in the subject-matter of Claim 1.

III. The Appellant lodged an appeal against the decision by telex of 8 November 1982 and paid the corresponding tax on the same day. The telex was confirmed by letter received 11 November 1982. The grounds for appeal were submitted by telex on 17 January 1983 and that telex was confirmed by letter received on 20 January 1983.

IV. In response to communications from the Board, the Appellant filed on 25 February 1989 new description and claims replacing those on file.

The new Claim 1 reads as follows:

"A method of processing image pixels derived by scanning an original image line by line to provide additional, intermediate, lines of image pixels using existing lines of image pixels, including the steps of:

(a) buffering blocks of image pixels from the first and second existing lines of image pixels to provide an address;

(b) addressing a memory storing discrete image outputs with said address to obtain the output corresponding to said address;

(c) using the image output obtained from said memory to construct a portion of at least one intermediate line;

(d) outputting one of said existing lines and said intermediate line or lines;

(e) repeating steps a, b, c and d using succeeding blocks of image pixels from said first and second lines to construct said intermediate line or lines until a complete existing line and the intermediate line or lines have been output;

(f) repeating steps a-e using the second and third existing lines to construct a second intermediate line or lines; and

(g) repeating step f for each succeeding pair of existing lines; the method being characterised in that

(h) said buffering of said blocks of image pixels to provide an address is carried out on a block-by-block basis, said image pixels being shifted through a buffer by a plurality of pixels at a time;

(i) the image outputs in the memory are predicted image pixel patterns comprising matrix patterns of image pixels of the same width as said plurality of pixels, there being one row of pixels in said matrix patterns for each intermediate line to be constructed;

(j) said intermediate line or lines are constructed by successive ones of said matrix patterns of image pixels with the same timing relationship as said blocks of image pixels; and

(k) each intermediate line or set of lines is output simultaneously with and separately from the preceding existing line, with the pixels of each intermediate line or set of lines in synchronism with the pixels of the preceding existing line."

The appended Claim 2 relates to a method according to Claim 1, characterised by the additional step of buffering image pixels from the existing lines equal to the said plurality of pixels plus additional image pixels from said existing lines to provide an expanded address.

V. During a conversation by telephone held on 9 March 1989, the rapporteur of the Board drew the Appellant's attention to a few clerical errors and to the lack of reference to the US-A-4 068 266 in the new pages of description and proposed appropriate amendments thereof. The Appellant assented to said amendments.

VI. The Appellant requested the impugned decision to be set aside and a European patent to be granted on the basis of the following documents:

- description, pages 1-7 received on 25 February 1989, with the amendments agreed to during the conversation by telephone of 9 March 1989.

- Claims 1 and 2 received on 25 February 1989, and

- drawings, Figures 2, 5-11 of the published patent application, to be re-numbered 1-8.

VII. To support his view, the Appellant substantially argued as follows:

(1) Although the addresses for interpolator (32) in the US-A-4 068 266 are formed by blocks of pixels, the pixels are shifted one pixel at a time through the register (31). According to the invention, a plurality of pixels are shifted at a time, whereby the advantage of quicker handling of a line of pixels is provided.

(2) In the method of the cited document, the video output consists of alternate complete lines of data. According to the claimed invention, the output consists of one or more intermediate lines which are output simultaneously and in synchronism with the pixels of the preceding existing line. Ability for rapid printing out of data is thereby provided and, even if the multiplexer were removed from the system disclosed in the US-A-4 068 266, said system would not be able to achieve the same results.

Reasons for the Decision

1. The appeal complies with Articles 106 to 108 and Rule 64 EPC. It is therefore admissible.

The Board is satisfied that in particular Article 108, last sentence is complied with. The impugned decision being dated 6 September 1982 and having regard to Rule 78(3), the last day for validly submitting the statement of grounds would, in view of Article 108, last sentence, have been 16 January 1983. The latter being a Sunday, the telex received the next day setting out the grounds for appeal

was, under Rule 85(1), received in time and duly confirmed by letter in accordance with Rule 36 (old).

2. Step (g) of the new Claim 1 does not mean that the second and third existing lines are to be interpolated as many times as there are pairs of such lines following the first pair. It obviously means that, while repeating step (f), the second and third lines are to be replaced by the first and second line of the pair to be interpolated, respectively.

The Board thus takes the view that the new Claims 1 and 2 are clear. They also meet the requirement of conciseness, since their wording does not contain unnecessary repetitions. Finally, they are supported by the application as originally filed - see the following passages of EP-A-0 006 351: page 7, lines 23 to 34; page 8, lines 3 to 18, 24 to 26 and 32 to 36; page 9, lines 1 to 7 and 24 to 30; Figures 5 and 6; as regards Claim 2, see the lines 15 to 18 of page 4.

The description was amended by deleting passages of the original version, by adapting it to the new claims and by including a reference to the US-A-4 068 266. The scope of protection being moreover reduced with respect to the one initially claimed, the Board is satisfied that the documents submitted by the Appellant comply with the requirements of Articles 84 and 123(2) EPC.

3. The Board also takes the view that the documents underlying Appellant's request disclose the invention in a manner sufficiently clear and complete for it to be carried out by a person skilled in the art - Article 83 EPC.

4. A method of processing image pixels to provide additional, intermediate lines of image pixels using existing lines of

image pixels according to the precharacterising part of Claim 1 is already known from US-A-4 068 266. The Appellant acknowledged this fact in his letter dated 2 January 1985.

According to US-A-4 068 266, however, the existing pixels are shifted one by one through a register (31) which comprises a first section (33) with (m) stages followed by a second section (34) with (k) stages, where (k) is the number of pixels of an existing line and (m) the number of columns of the prediction matrix. Each time the pixels are shifted by one step through the register (31), (m) successive pixels of an existing line and those having the same position in the next existing line are fed to an interpolator (32) for interpolating only one pixel of each intermediate line to be constructed.

Having regard thereto, the Board thus takes the view that the subject-matter of Claim 1 is novel and that said claim is correctly delimited with respect to the cited illustration of prior art - Article 54(1) EPC and Rule 29(1).

5. In the Board's opinion, the essential difference between the method according to Claim 1 and the one known from US-A-4 068 266 consists in that, according to step (i), the image outputs are matrix patterns of image pixels of the same width as the plurality of pixels referred to in step (h).

A plurality of pixels is construed to comprise more than one pixel. The claim thus implies that each intermediate line is assembled by successive pluralities of pixels, the pixels of each such plurality being all generated at the same time. This is contrary to the cited prior art. The Board is thus satisfied that the subject-matter of Claim 1 involves an inventive step within the meaning of Article 56 EPC.

6. Claim 1, received on 25 February 1989, meets the requirements of Article 52(1) EPC and, therefore, is allowable. The same applies to the appended Claim 2 which relates to a method derived from that according to Claim 1.

Order

For these reasons, it is decided that:

1. The decision under appeal is set aside.

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

   (a) description, pages 1-7 filed on 25 February 1989 with the following amendments:

   - page 1, between the definition of step (g) and the next line, insertion of "A method of this kind is disclosed in US-A-4 068 266."

   - page 3, line 4, suppression of the spacing between "field" and "s";

   - page 3, line 25, replacement of "interpolating" by "interpolated";

   - page 3, deletion of the sentence commencing at line 28 and terminating at line 29;

- page 3, line 35, replacement of the reference "Ln-1_1" by "Ln-1";

- page 4, line 16, insertion of "1" between the first symbol "Ø" and the comma;

- page 5, line 3, insertion of "wide" between "pixel" and "block";

- page 5, line 14, replacement of the small "m" by a capital one in "memory";

- page 5, line 28, leave a spacing between "there" and "shown";

- page 5, line 29, replacement of the small "t" by a capital one in "the";

- page 6, line 10, insertion of "each block being two pixels wide. Clock signals Ø1'," between the comma and the conjunction "or";

- page 6, line 14, replacement of "wise" by "wide";

- page 6, line 36, deletion of "from a low of one pixel", and

- page 7, deletion of the sentence commencing at line 5 and ending at line 7.

(b) Claims 1 and 2 filed on 25 February 1989.

(c) Drawings, Figures 2, 5-11 of the published patent application, renumbered 1-8.

The Registrar: The Chairman:

S. Fabiani P.K.J. van den Berg