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Datasheet for the decision of 22 February 2024

Case Number: T 1506/20 - 3.5.04

Application Number: 10768040.7

Publication Number: 2476245

IPC: H04N1/405

Language of the proceedings: EN

Title of invention:
COMPUTER PROGRAM FOR GENERATING 1-BIT IMAGE DATA FROM MULTIPLE-BIT IMAGE DATA

Applicant:
Hamillroad Software Limited

Headword:

Relevant legal provisions:
EPC Art. 83, 84, 123(2), 111(1) sentence 2
RPBA 2020 Art. 11

Keyword:
Sufficiency of disclosure - (yes)
Claims - clarity (yes)
Amendments - added subject-matter (no)
Remittal to the department of first instance - (yes)

Decisions cited:

Catchword:

Europäisches Patentamt
European Patent Office
Office européen des brevets

Beschwerdekammern

Boards of Appeal

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Case Number: T 1506/20 - 3.5.04

D E C I S I O N
of Technical Board of Appeal 3.5.04
of 22 February 2024

Appellant: (Applicant)	Hamillroad Software Limited Compass House Vision Park, Chivers Way Histon Cambridgeshire CB24 9AD (GB)
Representative:	Sharrock, Daniel John Nash Matthews LLP 24 Hills Road Cambridge CB2 1JP (GB)
Decision under appeal:	**Decision of the Examining Division of the European Patent Office posted on 5 March 2020 refusing European patent application No. 10768040.7 pursuant to Article 97(2) EPC.**

Composition of the Board:

Chair	B. Willems
Members:	M. Paci
	G. Decker

Summary of Facts and Submissions

I. The appeal is against the examining division's decision refusing European patent application No. 10768040.7, published as international patent application WO 2011/030101 A2.

II. In the decision under appeal, the examining division cited the following documents:

D1: EP 1 111 905 A2
D2: WHITE PAPER: "XM (Cross Modulated) Screening Technology", WHITE PAPER AGFA, 25 August 2003, pages 1-6, XP002287461

III. The decision under appeal was based on the following grounds:
- Claim 1 of all of the requests then on file (i.e. the main request, the first auxiliary request and the second auxiliary request) did not meet the requirements of Article 84 EPC.
- The application did not meet the requirements of Article 83 EPC.
- Claim 3 of all of the requests did not meet the requirements of Article 123(2) EPC.

IV. The applicant (appellant) filed notice of appeal. With its statement of grounds of appeal, the appellant filed amended claims according to a new main request, a new first auxiliary request, a new second auxiliary request and a third auxiliary request.

V. A summons to oral proceedings was issued. In a communication under Article 15(1) RPBA, the board announced the following preliminary opinion:

- The board was inclined to exercise its discretion under Article 12(4) and (6) RPBA to admit the main request filed with the statement of grounds of appeal into the appeal proceedings.
- The board disagreed with all of the objections under Articles 83, 84 and 123(2) EPC raised by the examining division against the main request underlying the decision under appeal.
- The claims of the new main request did not meet the requirement of clarity of Article 84 EPC because the phrase defining M and N in claim 1, i.e. "*wherein M defines the width in pixels of a full sized dot and N defines the height in pixels of a full sized dot*", was not present in the corresponding method of claim 12.
- Since neither a search nor an examination had been carried out by the department of first instance, provided the appellant filed amended claims overcoming the above-mentioned lack of clarity in claim 12 the board envisaged a remittal of the case to the department of first instance for further prosecution.

VI. With a letter dated 6 February 2024, the appellant filed amended claims according to a main request, which replaced the claims of the previous main request.

VII. In said letter, the appellant requested that the decision under appeal be set aside and that a patent be granted on the basis of the claims of the main request filed with the letter of 6 February 2024 or, alternatively, that the application be remitted to the examining division for further prosecution on the basis of the claims of the main request filed with the letter of 6 February 2024.

The appellant withdrew its request for oral proceedings on the condition that the above request was granted.

VIII. The board then cancelled the oral proceedings.

IX. Independent claims 1 and 12 of the pending **main request** read as follows:

*1. A computer program for executing on a computer system a computer process for generating 1-bit image data from multiple-bit image data, the 1-bit image data comprising "on" and "off" pixel values, each pixel value of the 1-bit image corresponding to a pixel of an output medium, which pixel an output device would attempt to mark when printing the 1-bit image data if the pixel value were "on", the 1-bit image data producing an image constituted by dots, each dot corresponding to a plurality of pixel values of the 1-bit image data, which pixel values correspond to a respective block of M*N horizontally and/or vertically adjacent pixels of an output medium, at least one of M and N being greater than one, wherein M defines the width in pixels of a full sized dot and N defines the height in pixels of a full sized dot, the process comprising the steps of:*

receiving multiple-bit image data comprising multiple-bit pixel values;

deriving said 1-bit image data from the multiple bit pixel values, by applying a screening algorithm to the multiple-bit pixel values to generate 1-bit pixel values, which are set to "on" and "off", wherein "on" 1-bit pixel values correspond to dots of the image;

*where densities of dots are greater than a first threshold density converting each "on" 1-bit pixel value to a reduced size dot, wherein where M or N is equal to one, a pixel value corresponding to a first or last pixel of a row of horizontally adjacent pixels, or to a first or last pixel of a column of vertically adjacent pixels of the corresponding M*N block of pixels is "off", and wherein, where both M and N are greater than one, the pixel values corresponding to the pixels of at least one of the first and last rows of horizontally adjacent pixels of the corresponding block are "off" and the pixel values corresponding to the pixels of at least one of the first and last columns of vertically adjacent pixels of the corresponding M*N block of pixels are "off", the reduced size dots of the image thus being obtained by not marking the pixels of at least one of the first and last rows of horizontally adjacent pixels and not marking the pixels of the at least one of the first and last columns of vertically adjacent pixels of the respective M*N block.*

*12. A method for electronically generating 1-bit image data from multiple-bit image data, the 1-bit image data comprising "on" and "off" pixel values, each pixel value of the 1-bit image data corresponding to a pixel of an output medium, which pixel an output device would attempt to mark when printing the 1-bit image data if the pixel value were "on", the 1-bit image data producing an image constituted by dots, each dot corresponding to a plurality of pixel values of the 1-bit image data, which pixel values correspond to a respective block of M*N horizontally and/or vertically adjacent pixels of an output medium, at least one of M and N being greater than one, wherein M defines the width in pixels of a full sized dot and N defines the*

height in pixels of a full sized dot, the method comprising the steps of:

storing multiple-bit image data comprising multiple-bit pixel values in an electronic memory;

*deriving the 1-bit image data from the multiple-bit pixel values, by applying a screening algorithm, to the multiple-bit pixel values to generate 1-bit pixel values which are set to "on" and "off", wherein "on" 1-bit pixel values correspond to dots of the image: where densities of dots are greater than a first threshold density of the dots converting each "on" 1-bit pixel value to a reduced size dot, wherein where M or N is equal to one, a pixel value corresponding to a first or last pixel of a row of horizontally adjacent pixels, or to a first or last pixel of a column of vertically adjacent pixels, of the corresponding M*N block is "off", and where both M and N are greater than one, the pixel values corresponding to the pixels of at least one of the first and last row of horizontally adjacent pixels of the corresponding M*N block are "off" and the pixel values corresponding to the pixels of at least one of the first and last columns of vertically adjacent pixels of the corresponding block are "off", the reduced size dots of the image thus being obtained by not marking the pixels of at least one of the first and last row of horizontally adjacent pixels and not marking the pixels of at least one of the first and last columns of vertically adjacent pixels.*

Reasons for the Decision

1. The appeal is admissible.

Main request - admittance under Article 13(2) RPBA

2. As compared with the claims of the main request on which the decision under appeal was based, the claims of the current main request filed with the letter of 6 February 2024 contain minor amendments in claims 1, 8 and 16 which merely address slight ambiguities in terms of language and do not alter the subject-matter of the claims. Moreover, in response to a corresponding objection raised by the board in its communication under Article 15(1) RPBA, the wording of claim 12 has been brought in line with that of claim 1. In view of the above, the board has decided to admit the main request filed with the letter of 6 February 2024 into the appeal proceedings under Article 13(2) RPBA in the version which entered into force on 1 January 2024.

Main request - Article 84 EPC

3. The examining division held that claim 1 of what was then the main request (which is essentially identical to claim 1 of the current main request) did not meet the requirement of clarity of Article 84 EPC because it did not disclose any details as to how the dots were distributed, how the size and structure of the dots were derived and how it was decided that a particular row or column should be set to "off" in order to obtain a reduced-size dot. Regarding the last point, the examining division pointed out that claim 1 did state that the reduced size was obtained by setting at least one of the first and last rows/columns of horizontally/

vertically adjacent pixels to "off", but failed to indicate how it was decided whether the first or the last row/column was selected (see points 14 to 16 of the Reasons for the decision).

4. The appellant essentially argued that the above information alleged by the examining division to be missing was not essential to the invention (see points 4.2 to 4.9 of the statement of grounds of appeal).

5. The board disagrees with the examining division and concurs with the appellant for the following reasons:

As disclosed on page 16, lines 1 to 10, of the description of the application as filed, the details of the screening algorithm are not essential. Various known screening algorithms may be used. The only constraint on the screening algorithm is the one stated in claim 1, i.e. that the full size of each dot is a block of M*N adjacent pixels, with at least one of M and N being greater than one. The invention essentially operates on the results of the screening operation, i.e. on the dots output by the algorithm. The "*deriving*" step in claim 1 defines how and under which conditions certain dots proposed by the screening algorithm are reduced in size. More specifically, as indicated in claim 1, where densities of dots are greater than a first threshold density, each "on" 1-bit pixel value is converted to a reduced-size dot,

wherein, where M or N is equal to one, a pixel value corresponding to a first or last pixel of a row of horizontally adjacent pixels, or to a first or last pixel of a column of vertically adjacent pixels of the corresponding M*N block of pixels is "off", and

wherein, where both M and N are greater than one, the pixel values corresponding to the pixels of at least one of the first and last rows of horizontally adjacent pixels of the corresponding block are "off" and the pixel values corresponding to the pixels of at least one of the first and last columns of vertically adjacent pixels of the corresponding M*N block of pixels are "off",

the reduced-size dots of the image thus being obtained by not marking the pixels of at least one of the first and last rows of horizontally adjacent pixels and not marking the pixels of the at least one of the first and last columns of vertically adjacent pixels of the respective M*N block.

The above dot-size reduction addresses the technical problem disclosed on page 2, lines 13 to 21, of the application as filed, of portions of an image having high densities of dots appearing too dark (see also page 10, lines 4 to 10, of the application as filed).

The examining division correctly observed that claim 1 did not indicate which of the first or the last pixel of a row/column (or both) was switched off. However, the board concurs with the appellant that this information is not essential because in all cases one or more pixels are turned off and thus the darkness is reduced, thereby addressing the technical problem. It should be noted that the application does not promise a perfect solution completely removing the extra darkness in areas of high-dot densities; rather, it proposes a solution which reduces this extra darkness. The board is of the view that the subject-matter of claim 1 achieves this reduction.

Main request - Article 83 EPC

6. Under points 19 to 21 of the Reasons for the decision under appeal, the examining division held that the application did not meet the requirement of sufficiency of disclosure of Article 83 EPC because the application as a whole did not disclose sufficient information as to how the dots were distributed, how the size and structure of the dots were derived and how it was decided that a particular row or column should be set to "off" in order to obtain a reduced-size dot.

7. The board notes that the examining division's objections under Article 83 EPC are essentially the same as those under Article 84 EPC but extended to include the description and drawings of the application (see point 3. above).

The board does not find these objections under Article 83 EPC persuasive for essentially the same reasons why the objections under Article 84 EPC were not found persuasive (see point 5. above).

Main request - Article 123(2) EPC

8. The examining division held that dependent claim 4 (erroneously referred to as claim 3 in the decision) of what was then the main request did not meet the requirements of Article 123(2) EPC because the expression "*all of the dots are reduced size dots*" was not directly and unambiguously derivable from the application as filed. Page 8, lines 12 to 18, of the description as filed disclosed that "*at least one pixel value*" could be set to "off" for all dots, but it did not imply that all of the dots were reduced-sized dots,

where **all pixels** of a row or column were to be set to "off".

9. The board disagrees with the examining division and concurs with the appellant for the reasons set out below.

According to the application as filed (see from page 12, line 9, to page 13, line 3, and from page 13, line 29, to page 14, line 3), reduced-sized dots are obtained from full-sized dots by not marking the pixels of **one or more whole rows** of pixels and of **one or more whole columns** of pixels. The only exception is when the full-sized dot only has one row or one column (i.e. M or N equals one), in which case the width of the one row or column is not reduced (because there would be no row/column left). According to the examples given in the aforementioned passages of the application as filed, when the full-sized dot has 4x4 pixels, the reduced-sized dot may have 3x3, 3x2 or 2x3 pixels and when the full-sized dot has 3x3 pixels, the reduced-sized dot may have 2x2 pixels.

The application as filed also discloses that the dots used should be as small as possible (page 13, lines 5 to 7), while noting that some output devices can reliably print smaller dots in portions of an image in which the densities of dots are high but not in portions of an image in which the densities of dots are low (page 13, lines 22 to 27). It further gives an example according to which for the above reasons reduced-sized dots of 2x2 pixels are used in areas of high-dot densities and full-sized dots of 3x3 pixels are used in areas of low-dot densities (from page 13, line 29, to page 14, line 3).

The "first threshold density" is disclosed *inter alia* in claim 5 of the application as filed.

The board is of the view that it is directly and unambiguously derivable from the above disclosure of the application as filed that where densities of dots are greater than a first threshold density, **all** of the dots may be reduced-sized dots.

Main request - conclusion regarding the objections raised by the examining division

10. For the reasons given above, the board disagrees with all of the objections under Articles 83, 84 and 123(2) EPC raised by the examining division against what was then the main request.

Conclusion regarding the main request

11. The board is satisfied that the claims of the pending main request filed with the letter dated 6 February 2024 meet the requirements of Articles 83, 84 and 123(2) EPC. The objection under Article 84 EPC against claim 12, raised *ex officio* in point 17 of the board's communication, has been overcome by the claims of the main request filed with the letter of 6 February 2024.

Remittal to the department of first instance

12. The reasons given in the decision under appeal against what was then the main request were based only on objections under Articles 84, 83 and 123(2) EPC. As explained above, the board does not find these reasons persuasive.

13. The board notes that no search was carried out for the present application because the claimed invention was held to be so unclear that no meaningful search could be carried out (see the Declaration of Non-Establishment of the International Search Report and the International Preliminary Report on Patentability).

14. In the decision under appeal, the examining division cited prior-art documents D1 and D2, but did not draw on them in the Reasons for the decision. These documents were introduced by the examining division with the official communication dated 18 May 2016 with the following explanation in point 3 thereof:

"*It seems that documents D1 and D2 may be relevant to the application, however any assessment of novelty or inventive step has to be postponed until a set of claims satisfying the requirements of the Article 84 EPC, or at least sufficiently disclosing all necessary steps to be performed by the method of the invention, is provided by the applicant.*"

15. In light of the above, the board considers that the introduction of documents D1 and D2 by the examining division cannot be regarded as being the result of a proper search for prior art. Moreover, patentability (novelty and inventive step) has not, by the examining division's own admission, been examined.

16. In the board's view, the absence of a search for prior art and of an examination as to the novelty and inventive step of the application at first instance can be considered "*special reasons*" within the meaning of Article 11 RPBA justifying a remittal under Article 111(1), second sentence, EPC.

Order

For these reasons it is decided that:

1. The decision under appeal is set aside.

2. The case is remitted to the examining division for further prosecution.

The Registrar: The Chair:

K. Boelicke B. Willems

Decision electronically authenticated