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D E C I S I O N
of 14 November 1997

Case Number: T 0708/96 - 3.5.1

Application Number: 86104403.0

Publication Number: 204094

IPC: H04N 1/40

Language of the proceedings: EN

Title of invention:
Scanning recording type printing method and apparatus for realizing the same

Patentee:
HITACHI, LTD.

Opponent:
Armaturen- und Apparatebau Franz Schuck GmbH

Headword:
-

Relevant legal provisions:
EPC Art. 56

Keyword:
"Admissibility of opposition (yes)"
"Inventive step (yes) - initial choice of closest state of the art no longer appropriate"

Decisions cited:
-

Catchword:

Europäisches Patentamt | European Patent Office | Office européen des brevets

Beschwerdekammern | Boards of Appeal | Chambres de recours

Case Number: T 0708/96 - 3.5.1

D E C I S I O N
of the Technical Board of Appeal 3.5.1
of 14 November 1997

Appellant: (Opponent)
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Decision under appeal: **Decision of the Opposition Division of the European Patent Office posted 7 June 1996 revoking European patent No. 0 204 094 pursuant to Article 102(1) EPC.**

Composition of the Board:

Chairman: P. K. J. van den Berg
Members: R. Randes
M. Lewenton

Summary of Facts and Submissions

I. This appeal is against the decision of the opposition division to revoke the patent because the grounds for opposition mentioned in Article 100(a) EPC prejudiced the maintenance of the patent as amended during the oral proceedings having regard to the following documents:

D1: EP-A-0 109 005

D5: JP-A-57 064 565 and English translation.

II. On 31 July 1996 the appellant (proprietor) lodged an appeal against the decision. The fee was paid on 15 August 1996. On 17 October 1996 a statement of grounds of appeal was filed, with an amended set of claims. A request for oral proceedings was also filed.

III. In a response to the communication from the Board, the appellant alleged that the opponent, namely the Schuck company, was not the real opponent so that the opposition should be rejected as inadmissible. The appellant stated that he would produce evidence to prove the allegation at the oral proceedings before the Board. The appellant filed a new set of claims and declared his intention to file amended pages of the description at the oral proceedings.

IV. At the oral proceedings, the appellant requested that the opposition be rejected as inadmissible. The appellant also requested that the decision under appeal be set aside and the patent be maintained in amended form according to claims 1 to 5, description pages 2 to 11 and drawing sheets 1 to 11 (main request), or according to claims 1 to 4 of the auxiliary request,

all submitted during the oral proceedings. The respondent (opponent) requested that the appeal be dismissed.

V. Claim 1 of the main request reads as follows:

"A scanning laser beam printing method for recording a multi-coloured image, wherein an intensity of a colour of a pixel is reproduced by selecting the size of a dot to be recorded within the respective pixel and having that colour, comprising the following steps:

(a) recording a first dot of a first colour in a scanning line within a first pixel at a border of the first pixel with a second pixel in said scanning line,

(b) recording a second dot of said first colour within the second pixel adjacent to said first dot,

(c) recording a third dot of a second colour within said first pixel to extend from an edge of said first pixel, which edge is different from said aforementioned border, towards the centre of said first pixel,

(d) recording a fourth dot of said second colour within said second pixel to extend from an edge of said second pixel, which edge is different from said aforementioned border, towards the centre of said second pixel, and

(e) repeating steps (a) to (d) for further pairs of such first and second pixels so that first and second pixels are alternatingly arranged in said scanning line and in further successive scanning lines."

Claim 4 of the main request, with the reference signs omitted, reads as follows:

"A laser beam scanning type printing device, comprising:
a memory means memorizing depth data signals for one scanning line,
a means including a clock generator and a counter and producing a comparison data signal formed by repeating an up counting operation and a down counting operation for every pixel,
a means comparing said depth data with said comparison data signal and thereby generating a pixel recording pulse signal, and
a timing means controlling the operation of said memory means, said comparison data production means and said pixel recording pulse signal production means, so that [The remaining features of the claim correspond to the steps (a) to (e) of method claim 1]"

Claims 1 and 4 of the auxiliary request correspond to claims 1 and 4 of the main request, but with the steps (d) and (e) deleted.

VI. The appellant argued as follows:

The opposition was inadmissible because the opponent was not the true opponent. The named opponent company normally had no interest in this technical field. Furthermore, the company was a German company who would not normally have filed prior art documents in Japanese with an English translation when German or US equivalents existed. Since knowledge of the identity of the opponent was a fundamental requirement for an opposition, the opposition should be rejected as inadmissible if this were in doubt.

The invention concerned problems associated with laser printers. Neither D5 nor D1 suggested applying the dot arrangements disclosed in these documents to a laser printer. Moreover, the problems solved in D5 (bleeding of ink) and D1 (displaying an image) were not applicable to laser printers and so the skilled person would not have considered them further. In particular, the optical aberration of the lines that appeared at the transition edges where tones change, described at page 1 of D1, was not caused by the unstable fringe of the scanning beam as in the patent. It was caused by the imperfect digitisation of the original signal which introduced midtone values in the pixels between black and white transitions. These values lined up in the case of horizontal and diagonal steps to produce visible artefacts. This problem was different from that of the patent because it occurred even if the dots used to reproduce the image were themselves sharp. This was the meaning of the statement "even in the absence of other aberrational optical patterns ..." at the beginning of page 2 of D1. Finally, the dot arrangement disclosed in D1 was not the same as the claimed arrangement.

VII. The respondent argued as follows:

The appellant's doubts as to the identity of the opponent were not justified and pertinent evidence had not been produced.

The subject-matter of claim 1 differed from that of D5 only in that it concerned a laser printer and that the dots of the same colour were arranged next to each other in an alternating manner. The skilled person would have considered applying the teaching of D5 to a laser printer because the discussion at page 2 of this document placed laser printers and ink jet printers on the same level. Laser printers were not discussed

further simply because they were considered large and expensive and therefore not practical at the time. The skilled person would have also considered D1 because it was in the same general field of reproducing halftone images. Although D1 concerned displaying images, the skilled person would have realised that the problem of transitions at pixel borders in halftone images was a general problem that also applied to laser printers. The skilled person would have therefore applied the solution of avoiding edges in halftone images generally and, in particularly, to the dot arrangement of D5. Once the skilled person had had the idea of avoiding edges, it would have been immediately apparent that, given a pair of similar pixels each containing dots of two colours, one pixel should have been reversed so that one edge was removed. The next pixel would then have had the correct arrangement and the next should have been reversed, and so on. The skilled person would therefore have arrived at the arrangement of claim 1 in which pairs of pixels were "alternatingly arranged".

Reasons for the Decision

1. The appeal is admissible.

2. *Admissibility of opposition*

2.1 The Board notes that the question whether an opposition filed by somebody who is actually acting for somebody else (nominal opponent) is admissible and other questions concerning the identity of the opponent are currently pending before the Enlarged Board of Appeal (G 3/97 and G 4/97). Thus if, in the present case, there were to be some doubt about the identity of the opponent, the Board would have to suspend the present appeal until the issues have been decided. At the oral

proceedings before the Board, however, the appellant's evidence was merely an oral statement of the above-mentioned suspicions (see under VI) concerning the named opponent's activities. The Board does not find that this evidence gives rise to any doubts about the opponent's identity. Thus, even if the Enlarged Board were to decide that an opposition may not be filed by a nominal opponent, this would have no effect on the present case, since the appellant's request that the opposition should be rejected as inadmissible is itself inadmissible in view of the lack of evidence. Under these circumstances the Board does not consider it necessary to wait for the answers to the questions before the Enlarged Board. The appeal can therefore be continued.

2.2 Thus, in view of this lack of evidence, the Board considers that the opposition is admissible.

3. *Amendments*

3.1 The appellant has amended independent claims 1 and 4 of the main request to include the feature which was considered essential by the opposition division at paragraph 4 of the decision under appeal. This feature defines that the first and second pixels are alternatingly arranged in the scanning line and in successive scanning lines. This is supported by Figure 6 of the published application.

3.2 The appellant has restricted the claims of both requests to laser beam printing. This is supported, for example, at column 14, lines 9 to 29 of the published application.

3.3 The Board is accordingly satisfied that the amended claims satisfy Article 123 EPC.

4. *The patent*

4.1 The patent concerns colour laser printing in which a laser beam scans a surface to be printed and is pulsed on and off to produce image pixels containing dots. The size of the dot of each colour is proportional to the data value of the colour in that pixel. The patent solves problems related to the definition of the dots caused by instability in the fringe of the laser beam spot. The technique of the patent shifts dots of different colours to different sides of a pixel. This avoids overlap of the unstable fringe areas and prevents colour errors. The technique also groups dots of the same colours in neighbouring pixels so that the dots merge. This reduces the ratio between the unstable fringe area and the stable centre area and improves the definition of the dot. The arrangement of the dots is shown in Figures 3D and 6 (first line) of the patent.

4.2 The appellant's restriction of the patent to a laser beam printer limits the scope of the claim significantly and, in the Board's opinion, is such that the reasoning in the decision under appeal no longer applies. This concerns, in particular, the choice of the closest state of the art which was D5 in the decision under appeal.

5. *Closest prior art*

5.1 D5 relates to an ink jet printing technique. It is common ground that D5 discloses, in Figure 3(B), arranging the black dots and any remaining coloured dots in different corners of the pixel block according to steps (a) and (c) of claim 1. Although claim 1 refers to the "border" of a pixel, the Board interprets this to cover also the corner of the pixel as disclosed in D1.

5.2 The Board is of the opinion that D5 does not disclose the application of this technique to a laser printer as required by claim 1. It is true that D5 mentions laser printers in the survey of prior art printer technology in the introductory part of the description, but it then goes on to identify a specific problem associated with ink jet printers, namely the bleeding of ink. This is the problem that is solved by the features identified above. Consequently, in order to use D5 as the closest state of the art, it is necessary to recognise that one distinguishing feature is a shift in application of the known features from an ink jet printer to a laser printer.

5.3 A difference based on such a shift in application of known features often gives rise to an artificial problem, for which it is not reasonable to consider a solution. It is for this reason that the established case law states that the definition of artificial and technically unrealistic problems is to be avoided. This also leads to the conclusion, stated in T 686/91 at paragraph 4 of the reasons and followed in T 410/93 and T 325/93 (all unpublished), that in the determination of the closest state of the art, ex post facto considerations should be avoided. Therefore a document not mentioning a technical problem that is at least related to that derivable from the patent specification, would not normally qualify as a description of the closest state of the art on the basis of which the inventive step was to be assessed, regardless of the number of technical features it might have in common with the subject-matter of the patent concerned.

5.4 In the light of the above, it is doubtful that D5 forms an appropriate starting point for the derivation of the problem upon which to access inventive step, since the techniques of the patent and D5 are directed to the

solution of different problems. The patent relates to problems of unstable areas of the beam spot in a laser printer, whereas D5 is actually concerned with the problem of the bleeding of ink in an ink jet printer. Thus the only problem that could fairly be posed without a pointer to the solution is the general problem of improving the image quality of the dots in a printed image.

6. *Inventive step (main request)*

6.1 The Board finds no suggestion in D5 that, faced with this problem, the skilled person would apply the disclosed dot arrangement to laser printing. In particular, it has not been shown that the problem solved in D5, namely the bleeding of ink, is a problem with laser printer technology which normally uses powder toner. Furthermore, it has not been shown that any other document would suggest trying this solution in a laser printer. The Board therefore does not consider that it is obvious to apply the teaching of D5 to a laser printer.

6.2 Furthermore, in the present case, claim 1 differs from D5 in that the dots in the second pixel are arranged so that the dot of the first colour is adjacent to the dot of the first colour in the first pixel (feature (b)). It also differs in that since the first and second pixels are alternatingly arranged in the scanning line, the dot of the second colour in the second pixel will be adjacent to the dot of the second colour in the next pixel (features (d) and (e)).

6.3 The Board does not consider that the skilled person would arrive at these features by considering the teaching of D1. First, D1 concerns a method for displaying a halftone image on a display such as a

cathode ray tube (CRT). The Board is of the opinion that a display using a scanning electron beam on a phosphorescent screen is technically very different from printing an image with either a laser beam or an ink jet. Thus the skilled person would not recognise that the problem at the transition areas mentioned at page 1 of D1 would arise in both areas. One difference is that the size of the dot on a CRT display is normally larger than that used in printing so that the stability of the beam spot may not be so critical. Second, in the embodiment of D1 the dot pattern of a current pixel (P1) is modified in dependence on the value of the previous pixel (P0). Thus, as shown in the truth table of the embodiment of Figure 1, the dot pattern of P1 is shifted to the left if P0 has its most significant bit high. This is not equivalent to the claimed alternating arrangement. Although D1 also states, at page 4, lines 25 to 27, that "Controlling pixel component configuration according to pixel sequence is the subject-matter of this invention, not the details of the selected truth table", the Board is of the opinion that no values of the truth table lead to the claimed arrangement. Finally, D1 concerns a monochrome display and so it is not apparent how the solution given at page 2, lines 8 to 11 of D1, namely reducing the number of component transitions in a picture, could be applied to the arrangement of coloured dots in D5.

6.4 The Board notes that the appellant's explanation of the cause of the lines described in D1 could count against the inventive step of the invention. If the lines are indeed caused by digitising the original signal and given that the digitising would apparently be the same for a CRT and a printer, the problem solved is a general one and therefore independent of whether the image is displayed or printed. The skilled person would realise that the same problem would occur with a

digitised signal in a laser printer and would consider applying the teaching of D1 to a laser printer. Thus the skilled person would automatically consider the solution of D1 without having expressly to consider the problem of instability of the laser beam spot. However the Board feels that the skilled person would not arrive at the above reasoning because the nature of the problem is not clearly explained in D1, and the skilled person would not go into the details of the cause of the lines in D1 for reasons given in the previous paragraph.

6.5 The Board therefore concludes that, starting from D5 as the closest state of the art, in order to arrive at the subject-matter of claim 1, the skilled person would first have to apply the teaching of D5 to a laser printer, then combine this with the teaching of D1 and finally substantially modify the solution given in D1, none of which steps are suggested in the cited prior art. Hence, the appeal must succeed and the decision under appeal be set aside for this reason alone.

6.6 The success of the appeal according to the above reasoning depends on the choice of a starting point which might no longer represent the closest state of the art for the reasons given in the decision T 686/91 (supra). The Board has therefore considered whether there is a better starting point in any other document cited in the decision under appeal. In the present case, none of the documents considered at any time in the proceedings has been shown to disclose more than background art in the field of laser printers as described in the introductory part of the patent. Starting from this state of the art, the problem would be seen in improving the image quality of a **laser** printed image. Since, as explained above, D5 and D1 neither relate to a laser printer, nor contain any suggestion of applying their solutions to a laser

printer, the Board is of the opinion that it would not be obvious to consider them to solve this problem. In addition, the alternating arrangement of pixels of features (b) and (e) is not obvious for the reasons given above.

6.7 In view of the above, the scanning laser beam printing method of claim 1 and the corresponding printing device of claim 4 of the main request are not obvious in the light of the documents of the state of the art, whether starting from D5, as was the case in the decision under appeal, or from background art in the field of laser printers, as above. The Board accordingly considers that claim 1 of the main request involves an inventive step.

7. Since the main request is allowable, there is no need to consider the auxiliary request.

Order

For these reasons it is decided that:

1. The opposition is admissible.

2. The decision under appeal is set aside.

3. The case is remitted to the first instance with the order to maintain the patent on the basis of the appellant's main request.

The Registrar: The Chairman:

N. Maslin P. K. J. van den Berg