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D E C I S I O N
of 24 June 1999

Case Number: T 1172/97 - 3.5.1

Application Number: 88906375.6

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IPC: G06K 15/02

Language of the proceedings: EN

Title of invention:
Electronic Collation

Patentee:
Eastman Kodak Company (a New Jersey corporation)

Opponent:
Océ-Nederland B.V.

Headword:
-

Relevant legal provisions:
EPC Art. 56

Keyword:
"Inventive step (no)"

Decisions cited:
-

Catchword:
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Beschwerdekammern | Boards of Appeal | Chambres de recours

Case Number: T 1172/97 - 3.5.1

D E C I S I O N
of the Technical Board of Appeal 3.5.1
of 24 June 1999

Appellant: (Proprietor of the patent)
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Decision under appeal: **Decision of the Opposition Division of the European Patent Office posted 6 October 1997 revoking European patent No. 0 321 547 pursuant to Article 102(1) EPC.**

Composition of the Board:

Chairman: P. K. J. van den Berg

Members: R. Randes
V. Di Cerbo

Summary of Facts and Submissions

I. This is an appeal by the proprietor against the decision of the opposition division to revoke the patent (Article 102(1) EPC).

II. Opposition was filed against the patent as a whole and based inter alia on Article 100(a) EPC together with Articles 52(1) and 56 EPC. The following documents were cited in the proceedings:

D1: EP-A-0 218 287

D2: GB-A-1 531 401

D3': GB-A-2 151 103

D4: US-A-4 547 628

III. The opposition division held that the grounds for opposition mentioned in Article 100(a) EPC prejudiced the maintenance of the patent as amended having regard to documents D1, D2 and D3'. The opposition division argued as follows:

The claimed electronic printer differed from that of D1 by the features of the characterising portion. These features solved the problem of avoiding the re-rasterizing of each page of a multipage document when printing in collated sets. The skilled person would have detected that re-rasterizing slowed down the printing process and would have considered increasing the capacity of the memory to store the whole multipage document in rasterized form. Apart from being generally

known, this was shown in D2 which related to the same problem as the patent in the case of scanned documents. In order to increase the capacity of the memory there were two obvious options available; increasing the size of the memory or compressing the data as claimed. Furthermore, D3' showed an example of compressing rasterized data representing multipage documents.

IV. The appellant lodged an appeal against the decision, paid the prescribed fee and filed a statement of grounds of appeal in time. The appellant requested that the decision under appeal be set aside and that the patent be maintained in amended form based on claims 1 and 2 of a main, first auxiliary, or second auxiliary request, all filed with the grounds of appeal dated 10 June 1998. In a letter of reply the respondent (opponent) requested that the appeal be dismissed. Both parties made an auxiliary request for oral proceedings.

V. Following a communication from the Board, oral proceedings were held on 24 June 1999 at which the parties reiterated their requests.

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

"Electronic printer of the type wherein documents are produced from image data received as character code signals to be applied to a pattern generator (10) for conversion to a rasterized video data stream for printing, the printer further comprising:
storing means (14), for electronically storing the rasterized image data of a document, and
electronic means (36, 38) for presenting the rasterized image data for printing in the proper sequence as often

as needed to produce the desired number of documents; characterized by:
compressing means (12) sequentially following the pattern generator for compressing the rasterized image data to be stored in the storing means;
expanding means (20) sequentially following the storing means (14) for electronically expanding the store rasterized image data;
said storing means (14) adapted to store in compressed form the rasterized image data of a multi-page document; and
said electronic means including electronic collation means (36, 38) for presenting the expanded rasterized image data of pages of the multipage document for printing in the proper sequence as often as needed to produce the desired number of collated multipage document sets without re-rasterization by the pattern generator."

Independent claim 2 is for a process comprising steps which correspond to the functional features of apparatus claim 1.

Claim 1 of the first auxiliary request adds, as the first feature of the characterising part, to claim 1 of the main request the following additional feature (claim 2 of the first auxiliary request has a corresponding process feature):

"a print server (8) for queuing print jobs as character code signals and outputting the character code signals for conversion by the pattern generator (10)"

Claim 1 of the second auxiliary request adds, as the

last feature of the characterising part, to claim 1 of the first auxiliary request the following additional feature (claim 2 of the second auxiliary request has a corresponding process feature):

"controller means (34) for allowing access by said compressing means and said expanding means to said memory and arbitrating between memory read and write cycles"

VII. The appellant argued as follows:

The invention concerned a printer which could print collated sets of multipage documents supplied in character code format, such as ASCII. The whole of each multipage document was rasterized, that is converted to bitmap or pixel data, compressed and stored in compressed form. In order to print collated copy sets of the multipage document, the data for the document was read out from the memory, expanded and supplied to the printer as many times as copies of that document were needed. By storing the complete document in rasterized form, the invention avoided the need to re-rasterize the data for successive copy sets which was a time consuming process.

D1 was the closest prior art and it disclosed a system comprising a rasterizer (RIP) and a buffer memory for storing only a single page of rasterized data before printing. D1 did recognise the problem of the speed of the RIP, but solved it in a different way by adding a bus to allow data into the memory while the RIP was processing. D1 was the only reference which recognised the speed problem of the RIP and it did not suggest

using a "post-RIP" memory larger than one page.

D3' addressed the problem of reducing the cost or memory requirements of a prior art high speed copying arrangement, assumed to be that disclosed in D2. This was achieved by compressing and storing the data to be printed in a multipage buffer memory 31. The input data was already in rasterized form having originated from a scanner. D3' also disclosed the possibility at page 1, lines 70 to 79, that the data could originate from "a word processor provided with a character generator and capable of releasing a document to be printed in the form of digital image data". Nothing could be derived from the expression "digital image data" because this covered both rasterized data and character code data. The use of the expression "releasing a document" implied that this data was character code data and not rasterized data. Moreover, the skilled person would have understood the term "character generator" to mean that the word processor generated character code data, which was the meaning explained in D4 at column 2, lines 13 to 17. The skilled person would therefore have understood that data from the word processor would have been in character code form and would have been rasterized in the printer.

D2 was less relevant than D3' because it only concerned a problem associated with scanning of documents which did not arise in D1. In particular, it avoided the need to recirculate, that is rescan, the set of input documents when making copies of a multipage document. It achieved this by storing the multipage document in rasterized form and printing the required number of copies from this buffer. D2 did not disclose a RIP

because it did not need one, nor did it disclose compression.

In summary, none of the cited prior art documents disclosed using a "post-RIP" buffer which was larger than one page. This reflected the thinking at the priority date of the patent which was to rasterize the data when it was required, and not, as in the invention, to store all of the data in rasterized form. Although a multipage buffer had been known since 1978 from D2, no one had considered using it post-RIP until the present inventor in 1987. In a competitive and fast developing field such as printers, this was a further indication of inventiveness.

In the first auxiliary request, the additional feature of the print server, although known per se, emphasised that the invention was in addition to the known pre-RIP memory and was not merely replacing it.

In the second auxiliary request, the feature of the controller means allowed simultaneous, and therefore faster, compressing and expanding of the memory data.

VIII. The respondent argued as follows:

The techniques for processing the rasterized data disclosed in the prior art were not dependent on the presence of a RIP. The presence of a RIP was therefore not decisive and the skilled person would have considered the prior art documents from the point of view of improving the processing of rasterized data. In any case, both D1 and D2 taught against re-rasterizing.

In general, the decision whether to add memory pre- or post-RIP was simply a matter of cost and speed.

The skilled person would have known that compression was a well known alternative to increasing the size of a data memory and this was indeed disclosed in the patent at column 3, lines 16 to 31. In addition, D3' disclosed compressing and storing rasterized data.

In fact, the system of D3' was not different from that of the patent. This was because, in the case of data from the word processor, D3' also disclosed providing a character generator which performed the function of rasterizing the data for several pages. In addition to the reference at page 1, which used the same terms "digital image data" for both types of data, this could be seen from page 2 lines 102 to 108 which stated that the signal format of the digital input unit 10, image memory unit 11 and image data output unit 12 were unified. Finally, on this point, it would not make sense to have a RIP in a printer.

The print server in the first auxiliary request was known. The skilled person would have considered adding a print server to a printer as a matter of routine because they were independent aspects.

There was hardly a memory in the world which did not have a controller means as added in the second auxiliary request. In particular, the DRAM controller 30 of D3', described at page 3, lines 17 to 20, was an example of the claimed controller.

Reasons for the Decision

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

2. In the main request, the appellant has only made minor corrections to the claims considered by the opposition division which do not affect the assessment of inventive step.

3. The Board agrees completely with the reasoning of the opposition division that leads to the finding that the subject-matter of claims 1 and 2 (of the present main request) does not involve an inventive step.

4. The Board would however augment the opposition division's reasoning and also take into account the appellant's additional arguments and requests in the appeal proceedings.

5. *Inventive step (main request)*

5.1 It is common ground that compared with D1 the invention solves the problem of saving time when printing collated sets of multipage documents. The appellant's argument is essentially that on the one hand the skilled person starting from D1 would not consider increasing the size of the post-RIP memory because D1 teaches a different solution, namely increasing the speed of the RIP. On the other hand, documents which do disclose a multipage memory for rasterized data, that is D2 and D3', do not suggest a use with a RIP since the data is already in rasterized form.

5.2 The Board notes that D1 does not in fact disclose the idea of producing collated sets of multipage documents. D1 concerns the problem of increasing the data processing speed to match the increased speed of a laser printer. Thus, starting from D1, the Board considers that the problem to be solved is how to produce collated sets of multipage documents at all. It would clearly be an advantage to do this as fast as possible. If the only other available prior art was the technique of repeatedly re-rasterizing a document in the print queue, as described in the introductory part of the patent, the Board agrees that the skilled person might well arrive at the solution suggested by the appellant, namely using a single page memory and a fast RIP, as disclosed in D1, to re-rasterize repeatedly each page as it is needed.

5.3 However, there is other prior art which solves the problem underlying the invention. In particular, D2 explicitly discloses another way of producing collated sets of multipage documents. This is achieved by storing all the data of a multipage document in rasterized form and electronically collating them as claimed. The Board considers that when the skilled person analyses this document using common general knowledge in the art he would realise that the solution to the problem is not dependent on the fact that the data originates from a scanner, but could be applied to any system which involves the processing of rasterized data. Thus although D2 does not explicitly suggest a use with a RIP, the Board considers that the skilled person would nevertheless consider using the electronic collation technique disclosed in D2 in the printer of D1.

5.4 Assuming for the sake of argument that the skilled person does in fact have the prior art mentioned in the patent, so that he is faced with both of the above mentioned solutions, the Board is of the opinion that he would recognise that the choice would depend on the well known trade-off between speed and cost. Thus the skilled person would appreciate that the multipage memory solution would be faster, but would require more memory, whereas the single page solution would be slower but would require less memory. The Board therefore agrees with the respondent that the choice is ultimately only a matter of cost. In other words, the Board is of the opinion that the aspect of D1 relating to increasing the speed of the RIP is merely one element in a possible alternative solution, and it does not teach against the claimed solution as alleged by the appellant.

5.5 Similarly, the Board judges that the skilled person would appreciate that the feature in D3' of compressing rasterized data could be used in any situation to reduce the memory required to store rasterized data. Again its use is subject to a similar trade-off, albeit slightly more complicated. In particular, it would be clear that compression would reduce the memory requirement at the expense of speed and complexity. Despite the opposite effect of rasterizing the whole document and compressing the data on the memory requirements and speed, the Board considers that it is routine practice for the skilled person as a circuit designer to balance up the overall trade-off depending on the required specification. Thus, if the memory were too expensive, data compression would be considered providing it was not itself too expensive or too slow.

5.6 Finally, there are no surprising effects in the relationships amongst the variables in the present case which would cause the known principles not to lead to the predicted cost and performance.

5.7 The above reasoning relies only on the aspect of D3' that relates to compressing and storing rasterized data. The Board is therefore of the opinion that the argument applies irrespective of whether D3' discloses storing and compressing character code data in the alternative where the data is provided by a word processor, as alleged by the appellant.

5.8 In actual fact, the Board doubts that the "character generator" mentioned in D3' in connection with the word processor has the meaning alleged by the appellant. Firstly, the passage in D4 cited by the appellant, which states that the character generator converts dot image data into character codes, appears to be in error. This is because D4 states that the character generator is incorporated into a printer which can only process dot image data so that it may be able to receive both types of data. If the printer can already process dot image data, then the character generator must enable the printer to receive character code data for this statement to be true. This implies that the character generator converts data from character code form into dot image form. Secondly, the latter meaning of character generator is in accordance with the Board's understanding of the traditional meaning of the term, whereby the device accepts character code data and produces pixel data, that is rasterized data. Finally, since the output of a word processor is usually character code data it would be logically

correct to connect it to such a character generator. On the other hand, it would not make sense to connect a word processor to a character generator according to the appellant's interpretation because such a character generator does not accept character code data.

5.9 In the light of the above interpretation it appears that D3' is indeed very similar to claim 1 as stated by the respondent.

5.10 The Board is accordingly of the opinion that the subject-matter of claim 1 of the main request does not involve an inventive step.

6. *Inventive step (first auxiliary request)*

6.1 It is common ground that the use of a print server for queuing print jobs as character code signals is a well known technique. The Board is of the opinion that the use of a print server would not alter the above mentioned considerations that lead to the finding of the lack of inventive step. The fact that the use of a print queue would enable the above-mentioned alternative solution of repeated re-rasterization of a document does not alter the fact that the claimed alternative is obvious for the reasons given above.

6.2 The Board is accordingly of the opinion that the subject-matter of claim 1 of the first auxiliary request does not involve an inventive step.

7. *Inventive step (second auxiliary request)*

7.1 The Board agrees with the respondent that the advantages of a controller means as claimed in this request are well known in the art. Furthermore, even though the image memory unit 11 in D3' does not actually compress and expand at the same time, the Board agrees with the respondent that the DRAM controller 30 in D3' nevertheless falls under the definition of the claimed controller.

7.2 The Board is accordingly of the opinion that the subject-matter of claim 1 of the second auxiliary request does not involve an inventive step.

8. There being no other requests, it follows that the appeal must be dismissed.

Order

For these reasons it is decided that:

The appeal is dismissed.

The Registrar: The Chairman:

M. Kiehl P. K. J. van den Berg