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D E C I S I O N
of 5 April 2000

Case Number: T 0226/97 - 3.4.2

Application Number: 89304857.9

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Language of the proceedings: EN

Title of invention:
Image processing apparatus

Patentee:
CANON KABUSHIKI KAISHA

Opponent:
GIESECKE & DEVRIENT GmbH
Océ-Nederland B.V.

Headword:

Relevant legal provisions:
EPC Art. 56, 84, 123(2)

Keyword:
"Amendments - added subject-matter (no)"
"Inventive step - (no) general technical knowledge"

Decisions cited:
-

Catchword:
-



Case Number: T 0226/97 - 3.4.2

D E C I S I O N
of the Technical Board of Appeal 3.4.2
of 5 April 2000

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Decision under appeal: Decision of the Opposition Division of the
European Patent Office posted 20 December 1996
revoking European patent No. 0 342 060 pursuant
to Article 102(1) EPC.

Composition of the Board:

Chairman: E. Turrini
Members: S. V. Steinbrener
B. J. Schachenmann

Summary of Facts and Submissions

- I. The appellant (= proprietor of the patent) lodged an appeal against the decision of the Opposition Division revoking European patent No. 0 342 060.
- II. Two oppositions against the patent as a whole had been filed by the respondents (= opponents 01 and 02, respectively) and based on the grounds of lack of novelty and/or inventive step (Article 100(a) EPC) and inadmissible amendments (Article 100(c) EPC).
- III. The oppositions *inter alia* referred to the following documents (using the numbering of the opposition proceedings):
- D2: US-A-4 723 149
- D3: US-A-4 728 984
- D6: IBM Technical Disclosure Bulletin, vol. 19, No. 4, September 1976, pages 1469 to 1470
- D7: JP-A-60-229572 (and English translation thereof furnished by opponent 02)
- D8: US-A-4 118 122, and
- D9: US-A-4 281 921
- which were again cited by the parties in the present appeal proceedings.

In addition, the parties submitted the following documents for the first time in the present appeal proceedings:

D12: US-A-4 325 981

D13: GB-A-2 155 860

D14: US-A-4 586 811

D15: US-A-4 739 377

D16: WO-A-85/01129 (and English translation thereof furnished by the appellant)

D17: Patent abstracts of Japan, vol. 9, No. 122, (P-359)[1845], 28 May 1985

D18: US-A-4 169 275

D19: GB-A-2 131 185, and

D20: US-A-4 194 221.

IV. In its revocation of the patent in suit, the Opposition Division held that the subject matter of claim 1 as amended met the requirements of Article 123(2) EPC. However, although in the Division's opinion the claimed subject matter was novel with respect to the available prior art, it was found to lack the inventive step required by Article 56 EPC in view of a skilled reader's implementation of the teaching of document D7.

V. With the statement of grounds of appeal, the appellant filed a main request and a first auxiliary request, the

independent claims of the former being identical to those considered in the impugned decision.

VI. In a communication pursuant to Article 11(2) of the Rules of Procedure of the Boards of Appeal, the Board expressed its doubts as to whether the independent claims of both requests met the requirements of Articles 123(2) and 84 EPC.

Having regard to patentability, the Board agreed with the parties that document D7 came closest to the subject matter of claim 1 which differed from the embodiment shown in Figures 1 and 2 of this prior art mainly in that

- (i) the supplying means supplied the same electrical image data to the determining means and to the processing and outputting means; and
- (ii) said electrical image data were used for determining whether or not the image represented by said data was derived from the specified original and for processing and outputting the image in a copying operation.

Moreover, document D7 indicated in a general way the possibilities of modifying the above-mentioned embodiment in that

- (a) a laser beam printer could be used as image outputting means instead of the conventional copying machine provided in Figure 2 of D7; and
- (b) picture processing could be carried out, based on the information of the determining operation, in

real time with one scan only.

The Board provisionally held the view that an embodiment of D7 containing said modifications should be chosen as a starting point for the assessment of inventive step.

The implicit consequences of such modifications on the design of the prior art apparatus as well as the remaining differences of the claimed subject matter with respect to the modified apparatus should be discussed at the scheduled oral proceedings, thereby defining the objective technical problem solved by the claimed subject matter with respect to said modified apparatus.

Finally, it should be assessed whether or not in the light of the technical problem any such differences would be obvious to a skilled person either from document D7 alone or from a combination of said document with the remaining prior art, in particular with one of documents D3 and D18 to D20, as alleged by the respondents.

The above observations seemed to apply *mutatis mutandis* to independent method claims 34 and 36 of the main request.

In case of non-allowability of the main request, it should be discussed at the oral proceedings whether or not the additional feature of the auxiliary request, i.e. parallel execution of the determining and image processing operations, contributed to the existence of an inventive step when taking account of the prior art identified, in particular modification (b) suggested in

document D7.

- VII. With a reply to the Board's communication, the appellant filed independent claims for a second and third auxiliary request and gave his arguments in response to the provisional opinion of the Board.
- VIII. Oral proceedings requested by all parties on a subsidiary basis took place on 5 April 2000. At the end of the oral proceedings, the Board's decision was given.
- IX. The appellant requested that the decision under appeal be set aside and that the patent be maintained in amended form on the basis of the main request filed with the letter of 25 April 1997, or on the basis of auxiliary request 1 filed with the same letter or auxiliary requests 2 or 3, filed with the letter dated 6 March 2000.
- X. The respondents requested that the appeal be dismissed.
- XI. The wording of the independent claims according to the appellant's requests reads as follows:

Main request

"1. An image processing apparatus having a forgery-prevention function, comprising:

supplying means (6; 401) for supplying electrical image data representing an original to be processed;
processing means (1; 412) for processing the electrical image data supplied by said supplying means;
image outputting means (8; 402) controlled by said processing means to output a processed image representing the original and derived from said

electrical image data;

determining means (2, 9; 452) including storage means (2) in which is pre-stored in electrical data form an image or spectral color range of the subject matter of at least one specified original in the form of a bank note, for determining, using the same electrical image data from the supplying means as that from which said processed image is derived, whether or not the image or spectral color range represented by that data is derived from the specified original; and

controlling means (1; 413) for controlling a process function within the apparatus in dependence upon the determination result of said determining means so as to provide said forgery-prevention function, by preventing output of a processed image faithfully representing the specified original."

"34. A method of operating an image processing apparatus to provide a forgery-prevention function, the method comprising the steps of: supplying electrical image data representing an original, processing the electrical image data supplied in said supplying step, and outputting a processed image which represents the original and is derived from said electrical image data; determining, using the same electrical image data supplied in said supplying step as that from which the processed image is derived and an image or spectral color range of the subject matter of at least one specified original in the form of a bank note stored in a memory in electrical data form, whether or not the image or spectral color range represented by the supplied image data is derived from the specified original, and controlling a process function of said apparatus in dependence upon the determination result of said determining step so as provide said forgery-

prevention function, by preventing output of a processed image faithfully representing the specified original."

"36. A method of operating an image processing apparatus to provide a forgery-prevention capability, the method comprising steps of: supplying electrical image data representing an original, processing the electrical image data supplied in said supplying step and outputting a reproduction image which represents the original and is derived from said electrical image data; determining using the same electrical image data supplied in said supplying step as that from which the reproduction image is derived and an image or spectral color range of the subject matter of at least one specified original in the form of a bank note stored in a memory in electrical data form, whether or not the image or spectral color range represented by the supplied image data is derived from the specified original, and controlling a process function of said apparatus in dependence upon the determination result of said determining step so as to prevent faithful reproduction of the specified original in the reproduction image."

First auxiliary request

Independent claims 1, 31 and 32 of the first auxiliary request correspond to claims 1, 34 and 36 of the main request, but recite the additional feature that the determination of whether or not the image or spectral colour range represented by the supplied image data is derived from the specified original is carried out "while the electrical image data is being processed by the processing means" (claim 1) and "while the electrical image data is being processed" (independent

method claims 31 and 32), respectively.

Second and third auxiliary requests

The independent claims of the second and third auxiliary requests correspond to the independent claims of the main request and the first auxiliary request, respectively, but with amendment to the controlling means/controlling step to recite the additional feature that a process function within the apparatus is controlled "so as to process electrical image data supplied by the supplying means" and "so as to process electrical image data supplied in the supplying step", respectively.

- XII. The appellant's arguments in support of its request may be summarised as follows:

Having regard to the objections under Articles 123(2) and 84 EPC, the patent in suit discloses 28 ways of carrying out the claimed invention, which fall into the categories of prohibiting an output, of changing a conventional copying operation or of modifying the image data. Thus, many of these ways do not actually require image processing. In particular, this is the case if output is prevented by internally cutting the copy or if a scanning operation is omitted. Hence, the general function of the controlling means as defined in claim 1 of the main and first auxiliary requests, respectively, has been originally disclosed. In this context, it must be taken into account that the separate functions of a controlling means and a processing means set out in claim 1 need not be implemented by separate physical elements but could be realised by one and the same CPU.

Moreover, in view of the various embodiments disclosed, there is no undue burden involved in putting the claimed invention into practice. Nevertheless, the claims of the second and third auxiliary requests have been limited to the specific aspect of controlling image processing.

The subject matter of claim 1 of the main request is also inventive with respect to the closest prior art, i.e. the image processing apparatus known from document D7. It has to be born in mind that in accordance with the case law of the boards of appeal and the Guidelines, the existence of an inventive step may only be challenged by a teaching in the prior art as a whole that would, not could, prompt a skilled person to modify the closest prior art. Thus, a mere possibility is not sufficient for obviousness, but there must be a recognisable pointer to the claimed invention in the prior art as a whole.

In accordance with the application documents as filed, the claimed invention does not aim at a mere cost reduction, but at a high forgery prevention capability. No such object is derivable from document D7. The appellant's extra documents D12 to D17 summarise the state in the art in forgery prevention. There is no pointer to the subject matter of claim 1 in the prior art which as a whole imparts the general teaching to look at the document being copied, but not at the electrical image data to be used for image processing. However, this perspective has a serious disadvantage for forgery prevention: as can be seen from Figure 2 of D7, in contrast to the contested patent providing a common data supply there are two separate systems, i.e. a copying means and a discriminating means. The latter

receives separate image data with the aid of a separate optical sensor. Therefore, a bank note may not be identified in the prior art if the separate sensor of the discriminating means were covered up or different images were used in the subsequent scans.

It is true that document D7 already teaches the application to a digital laser printer. However, in this case a skilled person would replace the photosensitive drum of Figure 2 of D7 by a further CCD (i.e. charge couple device) sensor in accordance with the general teaching of the prior art as best can be seen from document D14 applying the detection of confidential marks on a document by a separate sensor to the embodiment of a digital fax machine while still retaining the separate sensor. Similarly, in document D19 two CCDs are provided as well. Furthermore, the use of the CCD sensor of D7 for supplying electrical image data to be processed and output would require further modifications with respect to its optical and electrical layout so that no cost reduction may be achieved over a conventional two sensor solution. Moreover, the aspect of cost reduction could concern anything and is not primarily correlated with a minimum number of sensors.

According to the first auxiliary request, the processing and discriminating steps are carried out together. As can be clearly seen from the later embodiments of the patent in suit employing several scans, discrimination starts already during scanning so that the waiting period is reduced. Document D7 does not disclose simultaneous processing since one (additional) scan is provided, "based on the information of discrimination processing", i.e. after

the discrimination step has been completed. A skilled person would not consider document D19 to relate to parallel processing of the same data set.

The above arguments analogously hold for the remaining auxiliary requests which - apart from the limitation to the control of image processing - are basically identical to the preceding requests.

XIII. The respondents advanced the following counterarguments:

Respondent 01:

Claim 1 of the main request is not admissible because the vague generalisation of a "controlling means for controlling a process function...so as to provide said forgery-prevention function" is not originally disclosed.

Furthermore, the simultaneous image processing and discriminating steps according to the first auxiliary request are unclear and do not seem to be technically feasible.

The subject matter of claim 1 of the main request does not differ from the closest prior art, i.e. document D7, by the way forgery prevention is achieved, but by the use of a digital copying machine instead of an analogue copying machine provided in D7. The patent in suit thus derives a copy of the original from the stored image data, whereas in D7 a copy may be derived from a photosensitive drum receiving a separate set of image data by an additional scan. However, D7 already proposes the use of a laser printer without specifying the details of such an embodiment. Therefore, the

objective technical problem must be seen in adapting the teaching of D7 to a laser printer system known as such. The solution claimed in the contested patent consists in printing the stored data set after it has been released. It would be almost absurd to an average practitioner not to use already available digital data for a subsequent digital print process. In this respect, document D14 is totally irrelevant, the reasons for the specific approach used in this document being unknown.

Moreover, in D7 picture processing may be carried out in real time with only one scan which must be interpreted to mean simultaneous processing and discrimination steps as claimed in the first auxiliary request.

The above arguments apply with equal force to the second and third auxiliary requests.

Respondent 02:

Whereas no specific objections under Article 123(2) EPC against claim 1 of the main request will be raised, the observations of respondent 01 in this respect are generally supported. Moreover, it appears that according to the first auxiliary request two parallel paths are provided which work more or less simultaneously.

As can be seen from document D14, documents not to be copied have in some way been prepared by special marks or elements in the past. An improvement would consist in having a copying machine capable of recognising such documents without the need of special marks. This has been achieved by the invention described in document D7

providing an analogue copying machine plus a digital recognition circuit. Furthermore, even a digital copying machine has been proposed in D7 which already implies the use of one CCD for recognition and printing, although this is not explicitly stated. Since the CCD takes up the entire image area and the stored image data are not influenced by the recognition process, contrary to the appellant's opinion no further modification of the prior art sensor layout would be necessary.

If a skilled person were not immediately aware of the claimed solution, he would in any case consult the prior art and thereby retrieve document D19 also dealing with the technical problem of substituting a digital image recognition and copying system for an analogue one. As can be seen from D19, under these circumstances only one CCD circuit is used for supplying image data for two different functions. (Actually, there are two short CCDs provided in D19 which, however, can naturally be replaced by one long CCD.) Therefore, a combination of documents D7 and D19 would straightforwardly lead to the subject matter of claim 1 of the main request.

Finally, in D19 the size and position information is also processed in parallel with the image data so that the subject matter of the first auxiliary request cannot be considered inventive.

Reasons for the Decision

1. *Admissibility of appeal*

The appeal complies with the provisions mentioned in Rule 65 EPC and is therefore admissible.

2. *Admissibility and clarity of amendments*

- 2.1 In the Board's view, the subject matter of claim 1 of the respective requests can be considered to comply with Articles 123(2) and 123(3) EPC.

The objection raised in this respect by respondent 01 against the admissibility under Article 123(2) EPC of a general "controlling means for controlling a process function...so as to provide said forgery-prevention function" figuring in claim 1 of the main request does not appear to be justified if due account is taken of the appellant's arguments presented in the letter dated 6 March 2000 (see pages 2 to 7) and at the oral proceedings. In particular, there are various process functions within the apparatus which may be used for forgery prevention without actually involving image processing, e.g. in that an output of copying is prohibited (see the A-publication of the patent in suit, original claims 7 and 9) or a scanning operation is not performed (see original claim 13).

Similarly, the additional feature of claim 1 of the first auxiliary request relating to simultaneous discrimination and image processing steps can e.g. be based on Figure 26 and associated text of the A-publication corresponding to Figure 26 and associated text of the patent specification.

In the remaining requests, the subject matter of the main and first auxiliary requests, respectively, has been further limited to image data processing as the

process function which is used for forgery prevention. This amendment can, e.g., be based on Figures 11 to 15 and associated text of the A- and B-publication of the patent in suit.

- 2.2 Although the wording of the claims does not fully correspond in terminology with the description (in particular having regard to the use of the terms "processing means" and "controlling means"), the discussion at the oral proceedings has nevertheless convinced the Board of the fact that in the light of the description, a skilled person would be able to understand the claimed teaching and to put it into practice without undue burden as can also be seen from the discussion of patentability below (see point 3 below). Therefore, the claims are considered to meet the requirement of clarity (Article 84 EPC).

Having regard to the objection of respondent 01 against clarity (and feasibility) of parallel processing steps as claimed in claim 1 of the first auxiliary request, the Board would like to add that as the appellant has rightly pointed out, the image processing operation may for example depend on the provision of several data sets by subsequent scans so that discrimination results derived from only one data set may be available and used before image processing is completed (see e.g. Figure 26 and associated text of the patent in suit, in particular page 15, lines 32 to 39).

3. *Patentability*

3.1 Novelty

The Board is convinced that the prior art identified

does not anticipate the claimed subject matter of the respective requests. In fact, novelty has no longer been at issue in the present appeal proceedings.

3.2 Inventive step

- 3.2.1 There has been consent among the parties that document D7 comes closest to the subject matter of claim 1 of the main request.

This prior art already discloses an image processing apparatus having a forgery-prevention function (see D7, page 2, penultimate paragraph of the English translation) comprising a supplying means for supplying electrical image data (see D7, Figure 2: in particular sensor 1A and imaging lens 7), processing means (see D7, Figures 1 and 2: discriminating section (CPU) 2 and photosensitive drum 8), image outputting means (see D7, Figures 1 and 2: photosensitive drum 8 and LED array 10), determining means including storage means (see D7, Figures 1 and 2: discrimination section 2, dictionary circuit 3) and controlling means to provide said forgery-prevention function (see D7, Figures 1 and 2: signal generating circuit 4).

According to the prior art, the forgery-prevention function may consist in interrupting the copying process or in specific image processing measures as e.g. producing white domains on the copied image, changing its colour or contrast, or printing the mark "copy" on it (see D7, page 5, first paragraph of the English translation).

In the above assessment of the prior art, it has been assumed in accordance with the appellant's submissions

at the oral proceedings that the separate functions claimed need not be implemented as separate physical elements, but could be realised with the aid of one and the same CPU.

3.2.2 The claimed subject matter therefore differs from the embodiment shown in Figures 1 and 2 of D7 mainly in that

- (i) the supplying means supplies the same electrical image data to the determining means and to the processing and outputting means; and
- (ii) said electrical image data are used for determining whether or not the image represented by said data is derived from the specified original and for processing and outputting the image in a copying operation,

whereas in the embodiment of Figures 1 and 2 of D7 normally two different data sets derived from successive scans are furnished by the supplying means to the determining means and to the outputting means and are then utilised for determining and processing/outputting (see D7, page 2, last paragraph to page 3 of the English translation).

Moreover, document D7 indicates in a general way the possibilities of modifying the above-mentioned embodiment in that

- (a) a laser beam printer may be used as image outputting means instead of the conventional copying machine provided in Figure 2 of D7 (see D7, page 3, lines 22 to 23); and

(b) picture processing may be carried out, based on the information of the determining operation, in real time with one scan only (see D7, page 3, lines 36 to 38).

3.2.3 The Board agrees with the respondents that in the embodiment of Figures 1 and 2 of D7, a digital forgery-prevention function is combined with an analogue copying machine which necessarily depends on direct image writing on a photosensitive drum, whereas modifications of the analogue image stored on the drum may be digitally added depending on the discrimination result.

Furthermore, there is in fact a strong pointer in document D7 (see feature (a) above) to a modification of the known apparatus by substituting a (digital) laser beam printer for said analogue copying machine, without however specifying any details of the modified apparatus.

The Board considers this modified, fully digital apparatus to come closest to the claimed device which is also of digital type (see e.g. page 6, lines 29 to 30 of the patent in suit).

In view of the modified apparatus, the objective problem solved by differences (i) and (ii) mentioned above may therefore be seen in putting a fully digital version of the prior art apparatus into practice, in particular having regard to the organisation of image data supply and use of such data. As the appellant has asserted, this may also have an impact on the forgery-prevention capability.

3.2.4 The Board is convinced that a skilled person is well aware of the fact that the prior art referred to above provides in any case a digital image data set which is stored and processed in a CPU (see D7, Figures 1 and 2: discriminating section 2). An average practitioner is also aware of the fact that digital data stored in a CPU may be easily manipulated by standard routines as e.g. electronically duplicating the data so that they can be used for different purposes. In consequence, it must be concluded that a skilled reader when considering a fully digital version of the prior art apparatus would not see any need to generate a separate identical data set to be input into the CPU for the specific purpose of data processing since said data are already at hand in the correct format. An additional CCD sensor to read such separate data set would therefore be entirely superfluous.

Thus, in the Board's view an obvious implementation of the modified apparatus of D7 would make use of features (i) and (ii) mentioned above, i.e. a common data supply and use of the same data set for discrimination and image processing. The Board believes that only very specific conditions would prevent a skilled person from adopting this straightforward option. Such conditions are however not discernible in the present case.

3.2.5 The above conclusion is confirmed by the available remaining prior art, in particular document D19 describing the application of an image processing system for size and position detection and copying to either analogue or digital copying machines (see D19, Figures 4 to 6 and associated text and page 6, lines 3 to 13). In the case of the analogue apparatus (see D19,

Figure 4), two separate sets of image data are provided for copying (reflected light projected to drum by mirror 13) and size/position detection (reflected light projected to sensor 20 by lens 21) whereas only one data set including the image and size/position information is supplied to the CPU via CCDs 200 and 201 (see D19, Figure 5 and page 6, lines 42 to 45) in the digital case.

On the contrary, in document D14 referred to by the appellant and dealing with a similar implementation of a forgery-prevention system either with an analogue copying apparatus or with a digital fax machine (see D14, Figures 1 to 3 and associated text and Figure 17 and associated text), there are specific conditions in that the original to be copied bears fluorescent confidential marks which are only visible if exposed to infrared light. In both cases, a specific sensor for detecting fluorescent light in response to illumination with infrared light is provided (see D14, Figure 2a: sensor 30; and Figure 17: sensor 76), whereas the reflected light for copying is either directly projected on a conventional photosensitive drum (see D14, Figure 1: drum 1) or detected by an image sensor 74 in the digital fax machine (see Figure 17). In the Board's view, there are special reasons to retain the separate sensor for confidential mark detection in the digital embodiment of D14 since in fact two different images are to be detected, a latent one which is only visible under special illumination, and a normally visible one which is to be copied. It would thus be manifest to a skilled person that the separate confidential mark detector is necessary due to specific circumstances, i.e. in order to avoid any optical interference between both images and thus

guarantee proper confidential mark detection (see in this context also column 5, lines 45 to 50 of D14).

- 3.2.6 Finally, the Board considers a possible improvement of the forgery prevention capability provided by features (i) and (ii) mentioned above and referred to by the appellant to be an automatic result of the obvious approach set out above.

In consequence, the subject matter of claim 1 of the main request does not involve the inventive step required by Article 56 EPC, and claim 1 is accordingly not allowable.

- 3.2.7 Claim 1 of the first auxiliary request includes the further restriction that the determining step is carried out "while the electrical image data is being processed by the processing means".

In the Board's view, the option (b) of document D7 (see point 3.2.2 above) must be understood by a skilled person to mean the parallel processing claimed. However, irrespective of whether or not said prior art option already clearly relates to such parallel processing, the Board considers this type of operation to be an obvious possibility in CPU based systems which are remarkable for performing multiple tasks simultaneously.

Even if document D19 does not concern a situation where two identical data sets are processed in parallel, this document nevertheless underlines the fact that different operations, as e.g. storing and counting, may be carried out in a digital device at the same time (see D19, page 7, lines 49 to 64).

Moreover, parallel execution of discrimination and image reproducing steps in either analogue or digital copying machines having a forgery-prevention function is also known from document D14 (see in particular column 6, line 48 to column 7, line 9 and column 10, line 63 to column 11, line 9).

Hence, the subject matter of claim 1 of the first auxiliary request also lacks the inventive step required by Article 56 EPC.

3.2.8 In response to objections under Article 123(2) EPC, the subject matter of claim 1 of the second and third auxiliary requests has been limited to image data processing as the forgery prevention function, the claims otherwise corresponding to claim 1 of the main and first auxiliary requests, respectively.

Since this type of forgery prevention has already been proposed in document D7 (see point 3.2.1 above), said further restriction cannot support patentability. Hence, neither claim 1 of the second auxiliary request nor claim 1 of the third auxiliary request are allowable (Article 56 EPC).

3.2.9 Since, therefore, the first claims of all the appellant's requests on file lack inventive step over the teaching of document D7 as understood by the skilled person, the appeal cannot be successful.

Order

For these reasons it is decided that:

The appeal is dismissed.

The Registrar:

The Chairman:

P. Martorana

E. Turrini