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D E C I S I O N
of 4 May 2000

Case Number: T 0979/96 - 3.5.1

Application Number: 91302264.6

Publication Number: 0447262

IPC: H04N 1/46

Language of the proceedings: EN

Title of invention:
Facsimile apparatus

Applicant:
CANON KABUSHIKI KAISHA

Opponent:
-

Headword:
Ink jet printer/CANON KABUSHIKI KAISHA

Relevant legal provisions:
EPC Art. 52(1), 54(1), (2), 84, 123(2)

Keyword:
"Novelty (no)"

Decisions cited:
-

Catchword:
-

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Beschwerdekammern | Boards of Appeal | Chambres de recours

Case Number: T 0979/96 - 3.5.1

D E C I S I O N
of the Technical Board of Appeal 3.5.1
of 4 May 2000

Appellant: CANON KABUSHIKI KAISHA
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Decision under appeal: **Decision of the Examining Division of the European Patent Office posted 29 May 1996 refusing European patent application No. 92 302 264.6 pursuant to Article 97(1) EPC.**

Composition of the Board:

Chairman: P. K. J. van den Berg
Members: R. R. K. Zimmermann
P. H. Mühlens

Summary of Facts and Submissions

I. The appeal concerns European application No. 91 302 264.6 (publication No. 0 447 262). The application was refused by a decision of the examining division under Article 97(1) EPC essentially for the reason that the applicant maintained an unallowable subsidiary request, claim 1 of which was held to lack inventive step in view of documents US-A-4 661 822 and US-A-4 323 905. Claim 1 of the main request was considered to lack clarity, support by the description and novelty with regard to document US-A-4 323 905.

II. The decision refusing the application was posted on 29 May 1996. The appellant filed the notice of appeal on 22 July 1996, requesting reversal of the decision and grant of the patent. The appeal fee was paid the same day; the grounds of appeal were subsequently filed on 27 September 1996.

III. In public oral proceedings held before the Board on 4 May 2000, the matters in issue were discussed. The decision on the appeal was then announced on the basis of the following requests:

The appellant requested that the decision under appeal be set aside and that a patent be granted on the basis of claims 1 to 11 as filed on 28 April 2000.

IV. Claim 1 according to this request reads as follows:

"1. A data receiving apparatus comprising:

receiving means for receiving data transmitted through a transmission path in a communication operation;

memory means (60) for storing data received by said receiving means in the communication operation;

ink jet recording means (20) for ejecting ink to record a representation of data on a recording material;

record control means for controlling said ink jet recording means (20) to record data stored in said memory means (60) after the completion of said communication operation; and

detection means (113) for detecting non-ejection of ink in said ink jet recording means (20),

said apparatus being characterised in further comprising:

memory control means for controlling said memory means (60) in accordance with the result of detection by said detection means (113),

wherein after the data received in said communication operation and stored in said memory means (60) has been recorded, said memory control means causes the data to be cancelled or overwritten if said detection means (20) does not detect the non-ejection of ink after the recordal of the data received in said communication operation, and causes said memory means (60) to save the data if said detection means (113) detects the non-ejection of ink after the recordal of the data."

V. According to the appellant, the features defined in the preamble of claim 1 formed part of the prior art disclosed in document US-A-4 661 822. Unlike the prior art however the claimed invention performed a non-

ejection check as an additional action after recording the data received in the communication operation, and produced a warning or message in response to error detection while holding the data in memory. This enabled the data to be re-recorded after recovery to full operation.

The apparatus of document US-A-4 661 822, on the contrary, performed such a check only in an initial phase before the printing took place. There was no hint in the document that the interrupt triggered by the high ink pressure detector circuit could occur also after the recordal of data.

In addition, document US-A-4 661 822 did not disclose memory and memory control means for storing print data; Figure 9a of this document showing a reference to a data buffer only concerned paper feed control and was thus not related to the object of the invention.

Reasons for the Decision

1. The appeal complies with the requirements of Articles 106 to 108 and Rules 1(1) and 64 EPC and is thus admissible.

2. There are no doubts that amended claim 1 meets the requirements of clarity and support by the description and does not contain subject-matter which extends beyond the content of the application as originally filed, except for the feature that the memory control means "causes said memory means (60) to save the data if said detection means (113) detects the non-ejection of ink after the recordal of the data". For this

feature the only basis in the application is the passage column 15, line 45 to 54 of the description where instead of saving data the wording "holding data" is used. The claim wording implies an active control on the part of the memory control means, which is not necessary if the data are merely "held" in the memory since for merely holding data the memory control means may remain passive, at least for some type of memory.

Nevertheless, the technical result of actively saving or passively holding the data in memory is essentially the same; this minor deviation from the original disclosure does not impede the assessment of the invention regarding novelty and inventive step. The Board, therefore, accepts the present wording of the claim but considers it necessary to construe the claim in the light of the description for interpreting the wording "cause to save".

3. Regarding the prior art pertaining to the claimed invention, the appellant as well as the examining division in first instance relied *inter alia* on document US-A-4 661 822.

This document describes an ink jet printer comprising data receiving means (host interface 97) for receiving data transmitted in a communication operation from a host unit HTC through a transmission path (Figures 1a and 1b with the corresponding parts of the description), ink jet recording and control means (IC 109, D/A 111, CVGR, etc.), and record control means (print controller) for controlling said ink jet recording means. In the communication operation, the print data to be recorded in a print operation and a command (LF, FF etc.) are transferred, whereby the data

supplied in a communication operation correspond normally to a single line of the print-out (see column 12, lines 40 to 60).

It is apparent from the reference to data buffer (column 15, lines 45 f.) that the print data are stored under control of the controllers 91 and 102 in memory before being printed out. The buffer pointer is reset in every printing operation (see step 65 in Figure 9b), apparently immediately before the data are printed. After printing, the program waits for another supply of print data, a control sequence which implies that the print data are held so long in the data buffer as the buffer pointer is not reset and the data are not overwritten by new print data.

The ink jet printer of US-A-4 661 822 furthermore comprises detection means (ink pressure sensor 83) for detecting ink pressure in the ink feeding system and a high pressure detector circuit (column 5, lines 40 to 44). A high pressure may be produced during printing when the nozzle is or becomes plugged. As indicated in column 1, lines 50 to 60, continued operation of an ink jet head under high pressure may result into damage of the ink jet head, the feed pipe or the pump. This problem may be solved by detecting the ink pressure and immediately interrupting the recording operation in the case of malfunction to switch the system into a standby mode and to produce an alarm.

Instead of switching immediately into the standby mode document US-A-4 661 822 proposes to operate the ink jet head under reduced pressure for some time to re-establish a proper ink flow. As indicated in the description following column 18, line 67, the ink

pressure sensor 83 initiates an interrupt in response to high ink pressure which is serviced by the routine shown in Figures 10a and 10b. If the automatic recovery processing carried out by this service routine is not successful, the data are re-loaded, the pumps 71, 74 are deactivated and the system is switched into a standby mode in steps 128 ff.(see column 20, lines 47 ff.). As indicated in column 3, lines 34 to 38, only a "high degree of imperfect projection of an ink stream", results in such a shutdown of the printer. Therefore, ink pressure sensor 83 and print controller 102 (including the high pressure detector circuit) in combination are suitable for detecting non-ejection of ink in the ink jet printing system.

Since during interrupt the normal operations of the main routine are suspended, the data buffer is not changed by the service routine. Since the service routine outputs a busy signal to the host unit HTC there are indeed no new data transmitted which may overwrite the data buffer. In step 101 of the service routine, data "stored in the accumulator" (column 19, lines 36 ff.) are saved and in step 128 recalled. In the following step 129 only "timers" and "number of times counter" are cleared (column 20, lines 50 ff.). Therefore, print data stored in the data buffer are held in this buffer during the service routine and should still be present in the buffer when the service routine switches the printer into the standby mode.

Therefore, the print and data transfer controllers 91 and 102 in their function as memory control means are suitable for controlling the memory means (data buffer) in accordance with the result of detection by the detection means (print controller 102 and pressure

sensor 83) for detecting non-ejection of ink, wherein said memory control means causes the data to be cancelled or overwritten if said detection means does not detect the non-ejection of ink, and causes said memory means to save (hold) the data if said detection means detects the non-ejection of ink.

The appellant referred to the further definition given in claim 1 according to which the detection of non-ejection of ink and the memory control operations are performed "after the recordal of the data" and argued on the basis of this definition that in the prior art the ink pressure was checked only before printing operation during an initialization phase of the printing operation.

Such a reading, however, lacks any basis in document US-A-4 661 822. As explained in the introductory part of this document severe damage to components of the printing system may be caused by high pressure in the ink feeding system. Such a pressure can be produced for example by blocking of the nozzle and may thus occur at every stage of the printing operation; it would rather be a surprising feature to perform the high pressure detection and corrective actions only during an initial phase of printing operation when as in document US-A-4 661 822 the ink pressure sensor is suitable for measuring continuously the pressure. The document actually forces the skilled reader to assume that it is intended to execute the pressure control over the whole operating time of the ink pump, and indeed it points to such a solution by disclosing an early interrupt enabling (step 5, Figure 8a) without addressing any interrupt disabling at a later stage of the printing operation. On the contrary, the document explicitly

indicates that after the initialization steps 14 and 15 an ink pressure control responsive to the interrupt may be executed (column 24, lines 23 to 34). The implementation of a continuous monitoring of the ink pressure is in fact straightforward since the controller design proposed in this document uses microprocessors of the types 8085A and Z-80 which support asynchronous interrupt.

Therefore, the skilled person would have to infer from the information provided by this document that the high pressure interrupt is enabled before but also after the printing or recordal of the data which have been received in a communication operation.

4. It follows that the subject-matter of claim 1 is completely anticipated by document US-A-4 661 822 and thus lacks novelty (Article 54(1) and (2) EPC). The invention to which the application relates does thus not meet the requirements of Article 52(1) EPC.

Order

For these reasons it is decided that:

The appeal is dismissed.

The Registrar: The Chairman:

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