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D E C I S I O N
of 8 June 2006

Case Number: T 0943/04 - 3.2.05

Application Number: 96306848.1

Publication Number: 0767061

IPC: B41J 2/14

Language of the proceedings: EN

Title of invention:

Liquid ink printer for producing high resolution images

Patentee:

Xerox Corporation

Opponent:

Xaar Technology Limited

Headword:

-

Relevant legal provisions:

EPC Art. 84, 56

Keyword:

"Clarity (main request, no)"

"Inventive step (auxiliary request, no)"

Decisions cited:

-

Catchword:

-



Case Number: T 0943/04 - 3.2.05

D E C I S I O N
of the Technical Board of Appeal 3.2.05
of 8 June 2006

Appellant:
(Patent Proprietor)

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Respondent:
(Opponent)

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Decision under appeal:

Decision of the Opposition Division of the
European Patent Office posted 11 May 2004
revoking European patent No. 0767061 pursuant
to Article 102(1) EPC.

Composition of the Board:

Chairman: W. Moser
Members: W. Widmeier
W. Zellhuber

Summary of Facts and Submissions

I. The appellant (patent proprietor) lodged an appeal against the decision of the Opposition Division revoking European patent No. 0 767 061.

Opposition had been filed against the patent as a whole based on Articles 100(a) EPC (lack of novelty, Article 54 EPC, and lack of inventive step, Article 56 EPC) and 100(b) EPC.

II. Oral proceedings were held before the Board of Appeal on 8 June 2006.

III. The appellant requested as main request that the decision under appeal be set aside and that the patent be maintained on the basis of claims 1 to 9 filed as main request on 8 May 2006. As an auxiliary measure, the appellant requested that the decision under appeal be set aside and that the patent be maintained as granted.

IV. The respondent (opponent) requested that the appeal be dismissed.

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

"1. A printing machine (10) in which liquid ink is deposited on a recording medium (26) to produce high resolution images thereon, comprising:

a printhead (20) including a plurality of nozzles (74) and a plurality of transducers (76), the transducers having centers spaced a first distance, S , apart, each

of said plurality of transducers cooperatively associated with a plurality of N nozzles; and

means (14, 38, 44) for moving said printhead across the recording medium to deposit liquid ink thereon at locations separated by a distance D between adjacent droplets in a scanning direction of the printhead selected by a controller (21) as a function of the first distance, S, divided by the number N of nozzles cooperatively associated with each of said plurality of transducers, wherein the function is given by

$$D = N' \frac{S}{N}$$

wherein N' is an integer between 1 and N."

Claim 1 of the auxiliary request reads as follows:

"1. A printing machine (10) in which liquid ink is deposited on a recording medium (26) to produce high resolution images thereon, comprising:

a printhead (20) including a plurality of nozzles (74) and a plurality of transducers (76), the transducers having centers spaced a first distance, S, apart, each of said plurality of transducers cooperatively associated with at least two of said plurality of nozzles; and

means (14, 38, 44) for moving said printhead across the recording medium to deposit liquid ink thereon at locations separated by a distance between adjacent droplets in a scanning direction of the printhead selected by a controller (21) as

a function of the first distance, S , divided by the number of nozzles cooperatively associated with each of said plurality of transducers."

VI. This decision refers to the following documents:

C1: EP-A-0 476 860

C2: US 4,905,017

E3: US 4,396,924

E6: US 5,270,728

VII. The appellant argued essentially as follows:

The term "selected by a controller" in claim 1 of the main request is clear and supported by the description. Paragraphs [0011] and [0013] of the patent in suit explain the function of the controller. Anyway, this term was already comprised in claim 1 as granted and may therefore not be objected to in an opposition appeal procedure. The function to which the term "as a function of the first distance" relates is defined by the formula in claim 1 of the main request and is further explained in, and supported by, paragraphs [0024] and [0036] of the patent in suit. Although Figures 5 and 13 of the patent in suit show only one printer configuration, it is clear from paragraph [0036] of the patent in suit that printing of different grey levels is achieved by droplet distances other than S/N . The subject-matter of claim 1 of the main request is therefore clear and supported by the description so that it fulfils the requirements of Article 84 EPC.

Document C2 was wrongly interpreted in the opposition procedure. This document is silent about the droplet distance in the scanning direction. Also the other documents do not refer to a droplet distance as a function of the transducer distance. Document E3 discloses a single distance between droplets in the scanning direction. Document C1 discloses a printer where two nozzles are associated with one transducer. However, there is no disclosure as to the distance of droplets as a function of the transducer distance. The printing machine of claim 1 of the auxiliary request offers the possibility to select between different printing configurations, i.e. different distances of the droplets in the scanning direction which are a function of the transducer distance. Thus, the droplet distance in the scanning direction is not predefined and not fixed. Such a selection is not disclosed in the prior art. For this reason, the subject-matter of claim 1 of the auxiliary request involves an inventive step.

VIII. The respondent argued essentially as follows:

The function of the controller of the printing machine of claim 1 of the main request is not clear. It remains obscure what the controller is supposed to select. It also is not clear from this claim whether a printing machine falls under the scope of the claim when it comprises only one of the alternatives set out by the formula of claim 1 of the main request, or when it comprises all of these alternatives. Furthermore, it is not clear whether the printing machine of claim 1 of the main request offers a choice between various

settings during operation of the machine or a selection of one of these settings when the machine is manufactured. Thus, the subject-matter of claim 1 of the main request does not meet the requirements of Article 84 EPC.

Document C2 discloses a plurality of nozzles associated with one transducer. Although there is no explicit disclosure in this document as to the droplet distance in the scanning direction, it is obvious to select this distance such that a square grid of droplets is produced. Document E3 depicts in Figure 1 one transducer for two nozzles and in Figures 3 and 4 regular distances of the droplets in the scanning and in the vertical direction. Claim 1 of the auxiliary request defines a distinct relationship which exists between the droplet spacing in the vertical and in the scanning direction, which includes a regular droplet distance in both directions. As this claim covers a one-time selection of the droplet distance in the scanning direction when the machine is manufactured, an obvious modification of the printing machines disclosed in documents C2 or E3, based on common knowledge of a person skilled in the art, leads to the subject-matter of claim 1 of the auxiliary request, which therefore does not involve an inventive step.

Reasons for the Decision

1. *Main request*

Claim 1 defines that a controller selects the distance D between adjacent droplets in the scanning direction

as a function of the distance S of the transducers, and specifies this function as $D = N' \frac{S}{N}$ with N' being an integer between 1 and N . Whilst it is clear which droplet distances are possible for given values of S and N , it remains unclear whether the value N' , by which the distance D is to be selected, is a predefined value set when the printing machine is manufactured or set by the operator of the machine, or whether this value is selectable during operation of the printing machine. It is thus also unclear whether a printing machine, in order to fall under the scope of claim 1, must have one of the possible values of N' and thus one of the possible droplet distances in the scanning direction or whether it has to offer all of the possible values N' .

It thus is not possible to decide whether a given printing machine falls under the scope of claim 1. It follows that the subject-matter of this claim lacks clarity and that therefore it does not meet the requirements of Article 84 EPC.

2. *Auxiliary request*

Claim 1 of the auxiliary request corresponds to claim 1 as granted and cannot therefore be objected to under Article 84 EPC in the opposition appeal procedure.

Document C2 is to be considered closest prior art. This document discloses a printing machine in which liquid ink is deposited on a recording medium to produce high resolution images thereon (cf. claim 13 and column 2, lines 8 to 10), comprising a printhead including a plurality of nozzles and a plurality of transducers,

the transducers having centers spaced a distance apart, each of said plurality of transducers being cooperatively associated with two of said plurality of nozzles (cf. Figure 10A), means for moving said printhead across the recording medium to deposit liquid ink thereon (cf. column 7, lines 59 to 64), and a controller for controlling deposition of recording liquid by the printhead on the recording medium (cf. column 10, lines 25 to 27).

Document C2 does not disclose the distance of the droplets in the scanning direction so that the subject-matter of claim 1 differs from this prior art by the feature that the distance between adjacent droplets in the scanning direction of the printhead is selected by the controller as a function of the distance of the transducers, divided by the number of nozzles cooperatively associated with each of the plurality of transducers.

The expression "as a function of the first distance" is very general and does not limit the claim to specific droplet distances such as described in paragraph [0036] of the patent in suit. This passage relates to an embodiment which falls under the scope of claim 1; however, it cannot be construed as limiting the claim to the droplet distances described therein. Thus, a droplet distance in the scanning direction which is the same as the transducer distance complies also with the wording of claim 1.

Furthermore, as already expressed under point 1 above, the expression "distance ... selected by a controller" does not limit the claim to a printing machine in which

the droplet distance in the scanning direction is selectable during operation. The wording of claim 1 covers the cases in which the droplet distance is selected once during manufacture of the machine, or by the operator before use.

It follows that a printing machine which, in addition to the features of the printing machine of document C2, has equal droplet distances in scanning and vertical direction, and wherein these distances are selected by the controller due to a factory or user setting, is in accordance with claim 1.

Such equal droplet distances, however, are to be considered a simple matter of choice. Ink jet printers with equal resolutions in both paper directions are commonly known in the art (cf., for example, document C1, Figures 2 to 6 or document E6, column 1, lines 40 to 43), so that a corresponding setting of the controller of the printing machine of document C2 is to be considered a normal design routine of a person skilled in the art.

The subject-matter of claim 1 of the auxiliary request therefore does not involve an inventive step (Article 56 EPC).

Order

For these reasons it is decided that:

The appeal is dismissed.

The Registrar:

The Chairman:

M. Dainese

W. Moser