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D E C I S I O N
of 12 July 2005

Case Number: T 0952/02 - 3.5.01

Application Number: 97102706.5

Publication Number: 0792058

IPC: H04N 1/04

Language of the proceedings: EN

Title of invention:

Image data transmitting/receiving apparatus

Applicant:

KABUSHIKI KAISHA TOSHIBA

Opponent:

-

Headword:

Image scanner/TOSHIBA

Relevant legal provisions:

EPC Art. 56

Keyword:

"Inventive step (yes - after amendment)"

Decisions cited:

-

Catchword:

-



Case Number: T 0952/02 - 3.5.01

D E C I S I O N
of the Technical Board of Appeal 3.5.01
of 12 July 2005

Appellant:

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Decision under appeal:

Decision of the Examining Division of the
European Patent Office posted 20 March 2002
refusing European application No. 97102706.5
pursuant to Article 97(1) EPC.

Composition of the Board:

Chairman: S. Steinbrener
Members: K. Bumés
G. Weiss

Summary of Facts and Submissions

I. The appeal lies from the Examining Division's decision to refuse European patent application No. 97102706.5 for lack of inventive step having regard to a skilled person's general knowledge and the prior art documents

D1: EP-A-0 626 777;

D2: JP-A-05 110 814, corresponding to the (not pre-published) family member

D2': US-A-5 508 810.

II. The Appellant requests that the decision under appeal be set aside and a patent be granted on the basis of an amended set of claims 1 to 4 submitted at oral proceedings before the Board on 12 July 2005.

Claim 1 reads:

"1. An image data transmitting/receiving apparatus comprising:

a document table (5);

a scanning means (2) for scanning a document having long sides and short sides perpendicular to the long sides on the document table in a main scanning direction and a sub scanning direction perpendicular to the main scanning direction to read image data of the document, said scanning means being adapted for reading (S7) the image data at a first resolution along the main scanning direction and at a second resolution along the sub-scanning direction when the short sides of the document are parallel to the main scanning direction;

means (17) for rotating the image data of the documents scanned by the scanning means;

means (39) for transmitting the image data to an external device in accordance with the first and second resolutions; and

control means (CPU1, S17 - S24) for controlling the scanning means, the image rotating means and the transmitting means,

characterized in that

the control means is adapted for determining which of the long and short sides of the document on the document table are parallel to the main scanning direction of the scanning means, and, when the long sides of the document are parallel to the main scanning direction, for setting a resolution along the main scanning direction of the scanning means to the second resolution and a resolution along the sub scanning direction of the scanning means to the first resolution, and for controlling the scanning means such that the scanning means scans the document at the resolutions set by the control means, and

the image rotating means (17) is adapted for rotating the image data such that the image data of the document scanned by the scanning means is rotated 90 degrees without converting the first and second resolutions."

- III. In the Appellant's submission, the image processing apparatus of D1 does not inform the scanning means on the resolutions required for data transmission. Hence, an automatic adaptation of the scanning resolutions to the transmission resolutions cannot be suggested by D1. Even if the skilled person tried to use the apparatus of D1 to anticipate particular transmission resolutions,

he would have to modify the process by which D1 sets its scanning resolutions.

- IV. The chairman pronounced the Board's decision at the end of the oral proceedings.

Reasons for the Decision

1. *Teaching of the application*

The application relates to an apparatus for scanning a document and transmitting image data of the document to an external device, e.g. a facsimile device. The image resolutions in two orthogonal (main and sub-scanning) directions are standardised for transmission of the image data. The standard resolution for the main scanning direction typically differs from the standard resolution for the sub-scanning direction.

A document is normally scanned with its short sides parallel to the main scanning direction (A4-R orientation). When a document is scanned with its long sides parallel to the main scanning direction (A4-Y orientation), the image data must be rotated electronically for transmission if the receiving external device (destination device) expects image data to arrive in the normal A4-R orientation. Where, as usual, the resolutions in the two directions differ from each other (e.g. in facsimile transmission), the lower resolution of the stored image needs to be enhanced electronically to the higher one in order to comply with the transmission standard expected by the destination apparatus. However, such a conversion deteriorates the image quality.

To solve that problem, the present application proposes to interchange the scanning resolutions of the two scanning directions when a document is presented to the scanner in the A4-Y orientation. Hence, after rotation, the image data is directly available with the resolutions required for its transmission in the A4-R standard orientation. That approach dispenses with post-scan conversion and, thus, prevents image deterioration (column 1, line 7 to column 2, line 5 of the application as published, EP-A2-0 792 058 = "A2" hereinafter).

2. *Admissibility of amendments (Article 123(2) EPC)*

The Board is satisfied that the amended claim 1 does not extend beyond the content of the application as filed. In particular, the fact that the orientation of the document to be scanned is determined automatically can be gathered from A2, column 7, line 57 to column 8, line 7 (referring to Figures 5 and 6).

3. *Inventive step (Articles 52(1) and 56 EPC)*

3.1 It is common ground that D1 represents the most relevant prior art available in the proceedings. It discloses an apparatus according to the preamble of claim 1 intended for facsimile transmission of a document to a destination apparatus.

To scan ("read") a document, the scanning resolution in the main and sub-scanning directions can be set to specific values, e.g. 8 pel/mm (pixels/mm), 16 pel/mm, and 3.85 lines/mm, 7.7 lines/mm, 15.4 lines/mm,

respectively (D1, column 2, line 48 to column 3, line 1).

The scanned image data is stored into a memory and not transmitted until a complete image of the document has been received in the memory (D1, column 2, lines 36 to 43).

The destination apparatus may expect image data in a specific orientation which requires the stored image data matrix to be rotated by 90° prior to transmission (D1, column 3, lines 2 to 8 and lines 37 to 43; column 5, lines 29 to 41).

The image data rotation results in an image deterioration if the scanning resolution in the sub-scanning direction is lower than the scanning resolution in the main scanning direction (D1, column 1, lines 23 to 32).

That problem is obviated by raising the scanning resolution along the sub-scanning direction to a value close or identical to the scanning resolution along the main scanning direction if the former is lower (D1, column 2, lines 43 to 47; column 3, lines 8 to 14; column 5, line 49 - column 6, line 2; column 17, lines 9 to 12).

In addition, the pixel and line densities in the main and sub-scanning directions, respectively, can be converted electronically by an image size changer (22 - Figure 1) prior to transmission (D1, column 4, lines 42 to 53; column 7, lines 22 to 32; column 8, lines 36 to 51).

- 3.2 The refusal under appeal was based on independent claims which defined, albeit in less clear terms than the current version of claim 1, the setting by the control means of the scanning resolutions in both directions to particular ("assumed") values. Regarding D1, the Examining Division concluded from the modification of the scanning resolution along the sub-scanning direction that a skilled person would readily apply an analogous approach to the main scanning direction, i.e. he would also modify the scanning resolution in the main scanning direction once the resolutions required for the outbound image data were known.
- 3.3 The Examining Division's view may at first sight appear corroborated by a sentence in D1 stating that image reading (i.e. scanning) is performed "in accordance with the type of destination apparatus" (D1, column 3, lines 2 to 8; column 11, lines 47 to 49). However, D1 adapts the scanning resolution in the sub-scanning direction only if it is lower than the main scanning resolution. In other words, the sub-scanning resolution is always raised (if changed at all) and never lowered. For example, in the "super-fine" facsimile mode of D1, the resolution along the sub-scanning direction is higher than the resolution in the main scanning direction and no adaptation of the sub-scanning resolution is performed (D1, column 1, lines 15-22; flow chart of Figure 2, boxes S58, S60 and S74). Hence, taking the disclosure of D1 on its own, D1 does not teach a correspondence between a scanning resolution and an anticipated transmission resolution in any direction. Correspondence would imply that the scanning resolution in the sub-scanning direction may also be

decreased, namely when the transmission resolution in the main scanning direction is lower.

3.4 The apparatus as claimed is even more remote from D1 in that claim 1 teaches two scanning resolutions to be set to (higher or lower) values of transmission resolutions: If a document on the scanner table is detected in an orientation requiring data rotation, the two transmission resolutions are cross-assigned to the two scanning directions, i.e. the scanning resolution in a first direction (main scanning direction) is set to the (lower or higher) transmission resolution of the second direction (sub-scanning direction), and the scanning resolution in the second direction is set to the (higher or lower) transmission resolution of the first direction.

3.5 The decision under appeal states that image rotation is a deterministic process for which an input resolution value is obviously derived from the corresponding output value. The Board agrees to that statement to the extent that it presents cross-assigned resolutions as a simple approach which a skilled person is able to implement once told to do so.

However, the available prior art does not prompt the skilled person to systematically match a scanning resolution with a transmission resolution to address the problem of image deterioration.

3.6 The claimed solution is more than an alternative of D1.

3.6.1 Image quality is ensured consistently because both scanning resolutions are adapted to the required transmission resolutions.

The concept of D1 (merely increasing the sub-scanning resolution to a higher main scanning resolution) does not rule out situations in which a scanning resolution is lower than necessary for transmission. In such a situation, a post-scan conversion by the image size changer (22) is necessary and will reduce the image quality (see the abovementioned "super-fine" facsimile mode of D1 where an 8 pel/mm scanning resolution needs to be enhanced electronically to the required 15.41 pel/mm transmission resolution in the direction of the long sides of the document).

- 3.6.2 The image data memory is used more efficiently because the main scanning resolution is lowered when the sub-scanning resolution is raised, whereas in D1 the main scanning resolution is held constant.

- 3.7 Even if the skilled person tried to use the apparatus of D1 to anticipate particular transmission resolutions, he would have to modify the process by which D1 sets its scanning resolutions.

According to D1, the scanning resolutions are set by keyboard operations (column 6, lines 12 to 25 and lines 32 to 44; Figure 2, steps S58, S60; Figure 5, step S114). To enable an automatic adaptation of the scanning resolutions to the transmission resolutions, the setting process would require additional information. If that information was to indicate the type of destination apparatus, the destination apparatus would have to be called prior to the setting of the scanning resolutions. However, according to D1, the destination apparatus is not called until after the

scanning resolutions have been set (see steps S68 and S80 in Figure 2; steps S122 and S134 in Figure 5).

On the other hand, if a particular transmission standard is assumed (instead of calling the destination apparatus during the setting process), the orientation of the document being scanned has to be obtained automatically before the scanning resolutions are set, and both scanning resolutions have to be set according to the document orientation detected. The process of D1 provides only for an adaptation (increase) of the sub-scanning resolution, and information about whether or not image data may have to be rotated has to be inputted manually (D1, column 5, lines 29 to 41).

It is true that necessary modifications may appear consequential once the skilled person has decided to adapt both scanning resolutions to the transmission resolutions. Further, the partial aspect concerning an automatic determination of the document orientation is known by itself from D2' (paragraph bridging columns 2 and 3, for example). However, those modifications add weight to the argument that D1 does not lend itself as a straightforward starting point toward the claimed concept.

- 3.8 In the Board's conclusion, the claimed scanning and transmitting apparatus is not obvious from the teaching of D1, D2 and/or a skilled person's general knowledge.

Hence, on the basis of the prior art available to it, the Board considers the subject-matter of claim 1 to involve an inventive step.

3.9 Dependent claims 2 to 4, the description and drawings have been adapted to the wording of claim 1 and are also considered to meet the requirements of the EPC.

Order

For these reasons it is decided that:

1. The decision under appeal is set aside.
2. The case is remitted to the department of first instance with the order to grant a patent in the following version:

Description: Pages 1 and 5 to 14 as originally filed; page 2 submitted at the oral proceedings on 12 July 2005; page 3 filed with letter of 22 July 2002; page 4 filed with letter of 19 January 2001.

Claims: Nos. 1 to 4 submitted at the oral proceedings on 12 July 2005.

Drawings: Figures 1 to 5 and 7 as originally filed; Figure 6 submitted at the oral proceedings on 12 July 2005.

The Registrar:

The Chairman:

M. Kiehl

S. V. Steinbrener