Paper No. 31

UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE BOARD OF PATENT APPEALS
AND INTERFERENCES

Ex parte WAYNE M. DORAN, JOHN E. BRAY, CHARLES K. POPE and JOHN O. G. VIETH

Appeal No. 1997-0014
Application No. 08/192,937

ON BRIEF

Before THOMAS, HAIRSTON and DIXON, Administrative Patent Judges.

HAIRSTON, Administrative Patent Judge.

DECISION ON APPEAL

This is an appeal from the final rejection of claims 3 through 5, 7, 8, 25 through 29, 42, 44, 46 and 61. In a first Amendment After Final (paper number 17), claim 44 was amended, and claims 4 and 61 were canceled. In a second Amendment

After Final (paper number 22), claims 3, 5[1], 7, 8, 25 through 29, 42, 44 and 46 were amended. Accordingly, claims 3, 5, 7, 8, 25 through 29, 42, 44 and 46 remain before us on appeal.

The disclosed invention relates to a method and system for compressing non-transposed image data derived from a scanned document.

Claim 3 is illustrative of the claimed invention, and it reads as follows:

> 3. A method of processing non-transposed image data derived from scanning a document using a document scanner, with the image data presented in the form of successive non-transposed scan lines of pixels, with said scan lines of pixels including a first non-transposed scan line of pixels and a last non-transposed scan line of pixels to be processed from scanning said document, said method comprising the steps of:
>
> (a) splitting each non-transposed scan line of pixels into a plurality of processing channels, with a predetermined number of pixels being located within each of said processing channels, and with each of said processing channels having overlap pixels assigned thereto at the time of said splitting, with said overlap pixels being located between extremities of said processing channels; and
>
> (b) initiating thresholding of the pixels in said processing channels in parallel after a predetermined number of successive non-transposed scan lines of pixels has been generated but before the entire document has been scanned using the document scanner, with said thresholding using said

[1] Claim 5 improperly depends from canceled claim 4.

overlap pixels when thresholding pixels in a processing channel near the extremities thereof;

said method also including the step of:

(c) compressing the thresholded pixels in each of the processing channels in parallel along a direction which is perpendicular to said successive non-transposed scan lines of pixels through using reference rows which are parallel to target rows of thresholded pixels, with each said target row of thresholded pixels having only one pixel from each one of said successive scan lines of pixels, with said splitting and compressing steps, in addition to said thresholding step, being initiated after said first scan line of pixels is generated but before said last line of pixels is derived from said scanning
said document using the document scanner.

The references relied on by the examiner are:

Rohrer	4,590,606	May 20, 1986
Asano et al. (Asano)	4,757,552	July 12, 1988
D'Aoust et al. (D'Aoust)	5,007,100	Apr. 9, 1991
Klein et al. (Klein)	5,093,871	Mar. 3, 1992 (filed Oct. 10, 1989)
Chatterjee	5,317,652	May 31, 1994 (filed June 5, 1991)

Claims 3, 5, 7, 8, 25 through 29, 42, 44 and 46 stand rejected under 35 U.S.C. § 103 as being unpatentable over D'Aoust in view of Asano, Klein, Chatterjee and Rohrer.

Reference is made to the briefs and the answers for the respective positions of the appellants and the examiner.

OPINION

The obviousness rejection of claims 3, 5, 7, 8, 25 through 29, 42, 44 and 46 is reversed because the applied references neither teach nor would have suggested to the skilled artisan the initiation of a series of processing steps on scanned lines of pixels from a document scanner before the last line of pixels is derived from scanning the document.

The examiner is of the opinion (Supplemental Answer, paper number 24, page 5) that:

> With respect to the limitation that the image processing (thresholding and compressing) steps take place "before the last line of pixels is derived from said scanning said document," the Examiner notes that D'Aoust '100 at least suggests this feature since the memory (50) used to store image information can hold only four columns of image data (see column 5) and therefore could not contain the entire document image at one time . . . . Given D'Aoust's basic parallel processing system, it would have been obvious to one of ordinary skill in the art to begin the image processing steps before scanning the entire document in order to reduce the need for large, expensive memories and in order to provide the fastest and most efficient possible system. Clearly, the goal of any parallel pipeline-based system such as D'Aoust discloses is to perform operations concurrently rather than sequentially so that maximum efficiency can be achieved.

The examiner's contentions to the contrary notwithstanding, memory storage size in image digitizer 50 is not discussed in column 5 or in any other column of D'Aoust. The mere fact that D'Aoust's "entities 48, 52, 56, 60, and 64 represent a single document image pipelined processing assembly" (column 4, lines 23 through 26; Figure 2) does not mean that compression and other steps may take place while image data is still being received from the document scanner. D'Aoust is completely silent concerning the use of the "pipeline-based system . . . to perform operations concurrently rather than sequentially so that maximum efficiency can be achieved."

Appellants argue (Reply Brief, page 3) that:

> None of the prior art including D'Aoust '104 discloses or suggests a combination of elements in which a standard compression algorithm like the CCITT compression algorithm is applied to compressing non-transposed pixel data scanned from a document using a document scanner in a multiple processing channel environment wherein . . . compression in each channel begins after the first non-transposed scan line of pixels is generated but before the last non-transposed scan line of pixels is derived from scanning the document . . . .

We agree with appellants' arguments. When the teachings of D'Aoust are considered in toto, it is very clear that the

document 16 is completely scanned before the initiation of the compression operation (column 5, line 3 through column 6, line 46).

Even if we assume for the sake of argument that it would have been obvious to one of ordinary skill in the art to modify D'Aoust with the disparate teachings of Asano, Klein, Chatterjee and Rohrer, the initiation of compression and other operations while the document is still being scanned would not have been taught nor would it have been suggested by the combined teachings of the references. In summary, the obviousness rejection of claims 3, 5, 7, 8, 25 through 29, 42, 44 and 46 is reversed.

DECISION

The decision of the examiner rejecting claims 3, 5, 7, 8, 25 through 29, 42, 44 and 46 under 35 U.S.C. § 103 is reversed.

REVERSED

JAMES D. THOMAS)
Administrative Patent Judge)
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KENNETH W. HAIRSTON Administrative Patent Judge	BOARD OF PATENT APPEALS AND INTERFERENCES
JOSEPH L. DIXON Administrative Patent Judge	

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Michael Chan
NCR Corporation, Law Department
Intellectual Property Section, ECD-2
101 West Schantz Avenue
Dayton, OH 45479-0001