

The opinion in support of the decision being entered today was not written for publication and is not binding precedent of the Board.

Paper No. 29

UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE BOARD OF PATENT APPEALS
AND INTERFERENCES

Ex parte YING-WEI LIN

Appeal No. 2000-0404
Application No. 08/626,433

ON BRIEF

Before THOMAS, RUGGIERO, and GROSS, Administrative Patent Judges.
GROSS, Administrative Patent Judge.

DECISION ON APPEAL

This is a decision on appeal from the examiner's final rejection of claims 1 through 5, 7 through 13, 15 through 19, 21 through 26, and 28, which are all of the claims pending in this application.

Appellant's invention relates to a system and method for automatically segmenting a document image by classifying each type of imagery within the document with some probability. The input image signals are classified into a combination of at least three predetermined classes of imagery, and a plurality of non-zero probabilities are produced as a function of the properties

of each of the input image signals. Claim 1 is illustrative of the claimed invention, and it reads as follows:

1. A digital image processing system for automatically classifying a set of input image signals into a combination of at least three predetermined classes of imagery and producing output image signals in accordance with the classes, the set of input image signals forming part of a video image generated by an image input terminal, comprising:

a mixing circuit;

a data buffer for receiving the set of input image signals;

a classification circuit for characterizing properties of each of the input signals, said classification circuit producing, as a function of the properties of each of the input image signals, a plurality of non-zero probability values, each non-zero probability value representing a likelihood that one of the input image signals of the set of input image signals is a member of a respective one of the at least three predetermined classes of imagery, and transmitting probability signals indicative thereof to said mixing circuit; and

a plurality of image processing circuits receiving the set of input image signals from the data buffer, each of said plurality of image processing circuits being adapted to process the input image signals in accordance with a process identified for one of the at least three predetermined classes of imagery, said mixing circuit combining the signals from at least two of said plurality of image processing circuits in accordance with the probability signals received from said classification circuit to form a single set of output image signals, wherein a subset of the output image signals, representing input image signals from a transition zone where there is no high degree of certainty associated with any of the predetermined classes of imagery, comprise signals processed by the at least two of said plurality of image processing circuits so as to account for gradual shifts between regions of the input image representing the different classes of imagery.

The prior art references of record relied upon by the examiner in rejecting the appealed claims are:

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Tanioka	5,018,024	May 21, 1991
Mita et al. (Mita)	5,231,677	Jul. 27, 1993
Fujisawa	5,245,445	Sep. 14, 1993

Claims 1 through 5, 7 through 13, 15 through 19, 21 through 26, and 28 stand rejected under 35 U.S.C. § 103 as being unpatentable over Mita in view of Fujisawa and Tanioka.

Reference is made to the Examiner's Answer (Paper No. 28, mailed October 25, 1999) for the examiner's complete reasoning in support of the rejections, and to appellant's Brief (Paper No. 27, filed September 28, 1999) for appellant's arguments thereagainst.

OPINION

We have carefully considered the claims, the applied prior art references, and the respective positions articulated by appellant and the examiner. As a consequence of our review, we will reverse the obviousness rejection of claims 1 through 5, 7 through 13, 15 through 19, 21 through 26, and 28.

The examiner relies on Mita in view of Fujisawa and Tanioka to reject all of the pending claims. Mita, the examiner states (Answer, page 5), does not use a probability-based classification system to produce non-binary classification decisions. However, the examiner asserts (Answer, page 5) that probability-based classification systems are well-known in the art, as evidenced by Fujisawa, and thus would have been obvious for Mita's system for

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"a more flexible classification scheme than could be obtained simply by Mita's measure of a single spatial frequency characteristic." Appellant has not argued this point.

The examiner continues (Answer, page 6) that "[a]llthough Mita and Fujisawa are believed to operate on three or more 'classifications' of image types for the reasons explained above, the references do not explicitly state this feature." Nonetheless, the examiner asserts that separating an image into at least three classifications and processing them differently is both well-known and also taught by Tanioka. Accordingly, the examiner maintains that it would have been obvious to use at least three classifications in Mita's system. Appellant objects, and we agree with appellant.

Mita does not disclose three or more image classifications. The only determination made by Mita is whether the image is an edge or a non-edge area. See, for example, column 4, lines 38-45, or column 6, lines 33-41. Thus, as argued by appellant (Brief, page 5), Mita is limited to two image classifications.

Fujisawa explains in the background of the invention how prior art devices have based image processing on such detected image characteristics as a character image, a continuous tone image, and a screened dot image, or rather, three classes classifications. Further, Fujisawa discloses (column 2, lines

52-59) that "several levels of edge intensifying (or edge emphasizing) processes suitable for character images and several levels of smoothing processes suitable for photograph images and screened dot images can be set by the fuzzy controller" in his image processing apparatus. Thus, Fujisawa appears to describe three image classifications. Also, Tanioka, appellant admits (Brief, page 7), teaches the classification for three separate classes.

However, since Mita is solely directed to edge versus non-edge determinations, it is unclear to us how or why the skilled artisan would modify Mita to include additional image classifications, regardless of how well-known the use of three classifications is and regardless of the teachings of Fujisawa or Tanioka. Such a modification of Mita's system would destroy the purpose or function thereof. The Federal Circuit has held that "a proposed modification [is] inappropriate for an obviousness inquiry when the modification render[s] the prior art reference inoperable for its intended purpose. *In re Gordon*, 733 F.2d 900, 902, 221 USPQ 1125, 1127 (Fed. Cir. 1984)." *In re Fritch*, 972 F.2d 1260, 1265-1266 n.12, 23 USPQ2d 1780, 1783 n.12 (Fed. Cir. 1992). Therefore, we cannot accept the examiner's proposed modification of Mita. Accordingly, the examiner has failed to establish a *prima facie* case of obviousness, and we cannot

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sustain the obviousness rejection of claims 1 through 5, 7
through 13, 15 through 19, 21 through 26, and 28.

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CONCLUSION

The decision of the examiner rejecting claims 1 through 5, 7 through 13, 15 through 19, 21 through 26, and 28 under 35 U.S.C. § 103 is reversed.

REVERSED

JAMES D. THOMAS)	
Administrative Patent Judge)	
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)	BOARD OF PATENT
JOSEPH F. RUGGIERO)	APPEALS
Administrative Patent Judge)	AND
)	INTERFERENCES
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ANITA PELLMAN GROSS)	
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