

THIS OPINION WAS NOT WRITTEN FOR PUBLICATION

The opinion in support of the decision being entered today (1) was not written for publication in a law journal and (2) is not binding precedent of the Board.

Paper No. 31

UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE BOARD OF PATENT APPEALS
AND INTERFERENCES

Ex parte DARA T. KHANI

Appeal No. 97-2699
Application 08/112,535¹

HEARD: MARCH 10, 1999

Before THOMAS, FLEMING and LALL, *Administrative Patent Judges*.

FLEMING, *Administrative Patent Judge*.

DECISION ON APPEAL

This is a decision on appeal from the final rejection of claims 1 through 30, all of the claims pending in the application.

¹ Application for patent filed August 27, 1993.

The invention relates to an apparatus and method for extracting robust, prominent features for target tracking.

Independent claim 1 is reproduced as follows:

1. A method of analyzing a region of interest in an original image having at least one feature to extract at least one robust feature, comprising the steps of:

passing signals representing the original image through a first filter to obtain signals representing a smoothed image;

performing a profile analysis on the signals representing the smoothed image to determine a signal representing a size value for any feature in the original image;

performing an analysis on the signals representing the size values determined by the profile analysis to determine a signal representing a most frequently occurring size value;

selecting an optimal filter based on the determined signal representing the most frequently occurring size value; and

passing the signals representing the original image through the optimal filter to obtain signals representing an optimally filtered image having an optimally high signal-to-noise ratio.

The references relied on by the Examiner are as follows:

Barry	4,482,970	Nov. 13, 1984
Toriu et al. (Toriu)	4,908,872	Mar. 13, 1990
Moorehead et al. (Moorehead)	5,253,765	Oct. 19, 1993

Gonzales et al. (Gonzales), Digital Image Processing; Addison-Wesley 1992, pp. 559-560.

Claims 1, 2, 6 through 8, 12 through 15 and 27 stand rejected under 35 U.S.C.

§ 103 as being unpatentable over Barry, Moorehead and Gonzales. Claims 3 through 5, 9

through 11, 16 through 26 and 28 through 30 stand rejected under 35 U.S.C. § 103 as being unpatentable Barry, Moorehead, Gonzales and Toriu.

Rather than repeat the arguments of Appellant or the Examiner, we make reference to the briefs² and the answer for the details thereof.

OPINION

After a careful review of the evidence before us, we agree with the Examiner that claims 28 through 30 are properly rejected under 35 U.S.C. § 103. Thus, we will sustain the rejection of these claims but we will reverse the rejection of remaining claims on appeal for the reasons set forth *infra*.

Claims 28 through 30 stand rejected under 35 U.S.C. § 103 as being unpatentable over Barry, Moorehead, Gonzales and Toriu. At the outset, we note that Appellant has indicated on page 10 of the brief the claims 28 through 30 do not stand or fall together. However, on pages 4 through 6 of the brief, we note that Appellant does not argue why claims 29 and 30 are separately patentable over the art applied by the Examiner, but instead Appellant merely repeats the claim language in the Appellant's arguments on pages 25 of the brief. 37 CFR § 1.192 (c)(7)(July 1, 1995)

² Appellant filed an appeal brief on April 10, 1996. We will refer to this appeal brief as simply the brief. Appellant filed a reply appeal brief on September 11, 1996. We will refer to this reply appeal brief as the reply brief. The Examiner stated in the Examiner's letter mailed December 23, 1996 that the reply brief has been entered and considered but no further response by the Examiner is deemed necessary.

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as amended at 60 Fed. Reg. 14518 (March 17, 1995), which was controlling at the time of

Appellant's filing the brief, states:

For each ground of rejection which appellant contests and which applies to a group of two or more claims, the Board shall select a single claim from the group and shall decide the appeal as to the ground of rejection on the basis of that claim alone unless a statement is included that the claims of the group do not stand or fall together and, in the argument under paragraph (c)(8) of this section, appellant explains why the claims of the group are believed to be separately patentable. ***Merely pointing out differences in what the claims cover is not an argument as to why the claims are separately patentable.*** Emphasis added.

We will, thereby, consider Appellant's claims 28 through 30 to stand or fall together, with claim 28 being considered the representative claim

On page 24 of the brief, Appellant argues that claim 28 recites a method of starting an ending point identification, pairing and size determination which is not taught by the art of record. Appellant further states that "the cited art fails to suggest the combination of recited features recited in claim 28."

The Examiner argues on page 12 referring to page 9 of the answer that Toriu teaches an ending point identification and pairing. In particular, the Examiner argues that Toriu teaches ending point identification by determining the x and y gradients to find the edges and then performing the pairing step by the grouping of x and y points. The Examiner then points out that the size of the object may be determined by an elementary calculation. We note that the rejection as set forth in the final action relies on Moorehead for the teaching of calculating size.

As pointed out by our reviewing court, we must first determine the scope of the claim. "[T]he name of the game is the claim." *In re Hiniker Co.*, 150 F.3d 1362, 1369, 47 USPQ2d 1523, 1529 (Fed. Cir. 1998). Unlike Appellant's claims 1 through 27, Appellant's claim 28 does recite limitation directed to selecting an optimal filter based upon the most frequently occurring size. Appellant's claim 28 is directed to a method of performing a profile analysis for determining size of a feature by identifying positions of the feature starting points and ending points, identifying the feature by pairing the starting and ending points and determining size of the identified feature by subtracting the position of the starting point and ending point.

Toriu teaches in column 4, line 64, through column 5, line 63, a simplified discrimination method of selecting the pixels located by an X-axis and Y-axis point that define a pattern contour. Toriu teaches that the grey level gradient vectors of the pixels are determined in X-axis and Y-axis direction. The magnitude of the grey level gradient of each pixels is compared with those of neighboring pixels located in either direction of X-axis or Y-axis. The pixel which has the maximum magnitude of gray level gradient among those of adjacent pixel is discriminated from each group as a contour line. Thus, we find that Toriu teaches identifying positions of feature starting points in the region of interest and identifying positions of feature ending points in the region of interest as recited in Appellant's claim 28.

Turning to Moorehead, we find that Moorehead teaches in Figures 8 and 9 and in

column 5, line 45, through column 6, line 26, that the minimum and maximum dimensions of a mushroom are determined by pairing the determined border pixels and by determining the minimum and maximum dimension by subtracting the position of the paired positions. Therefore, Moorehead teaches identifying features in said region of interest by pairing and determining the size of the identified features as recited in Appellant's claim 28.

It is the burden of the Examiner to establish why one having ordinary skill in the art would have been led to the claimed invention by the reasonable teachings or suggestions found in the prior art, or by a reasonable inference to the artisan contained in such teachings or suggestions. *In re Sernaker*, 702 F.2d 989, 995, 217 USPQ 1, 6 (Fed. Cir. 1983). In addition, the Federal Circuit states that "[t]he mere fact that the prior art may be modified in the manner suggested by the Examiner does not make the modification obvious unless the prior art suggested the desirability of the modification." *In re Fritch*, 972 F.2d 1260, 1266 n.14, 23 USPQ2d 1780, 1783-84 n.14 (Fed. Cir. 1992), *citing In re Gordon*, 733 F.2d 900, 902, 221 USPQ 1125, 1127 (Fed. Cir. 1984). "Additionally, when determining obviousness, the claimed invention should be considered as a whole; there is no legally recognizable 'heart' of the invention." *Para-Ordnance Mfg. v. SGS Importers Int'l, Inc.*, 73 F.3d 1085, 1087, 37 USPQ2d 1237, 1239 (Fed. Cir. 1995), *cert. denied*, 117 S.Ct. 80 (1996), *citing W. L. Gore & Assocs., Inc. v. Garlock, Inc.*, 721 F.2d 1540, 1548, 220 USPQ 303, 309 (Fed. Cir. 1983), *cert. denied*, 469 U.S. 851 (1984). In addition, the Federal Circuit

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reasons in **Para-Ordnance Mfg. v. SGS Importers Int'l, Inc.**, 73 F.3d at 1087-88, 37 USPQ2d at 1239-40, that for the determination of obviousness, the court

must answer whether one of ordinary skill in the art who sets out to solve the problem, and who had before him in his workshop the prior art, would have been reasonably expected to use the solution that is claimed by Appellant.

We note that Moorehead teaches a method of determining the contour line or boundary of a mushroom image in column 5, lines 10-45. Toriu teaches a much improved method of determining the boundary line that is simple and more accurate. In fact, Toriu teaches in columns 1 through 3 that their invention is an improvement of prior art boundary line determination methods which includes the method used by Moorehead. Therefore, we find that those skilled in the art having the teachings of Toriu before them would have modified the Moorehead method of profile analysis for determining sizes of features appearing in a region of interest in an original image to use the Toriu boundary line (pattern contours) extracting method as recited in Appellant's claim 28.

Turning to the claims 1 through 27, Appellant argues on pages 14 through 17 of the brief that none of the references teach or suggest a process for selecting an optimized filter based on the most frequently occurring size. Appellant further argues on pages 4 through 6 of the reply brief that

Appellant's particular claimed combination of method steps or apparatus for selecting and using an optimized filter based on a most frequently occurring size appearing in an image is not taught or suggested in the prior art cited in the Examiner's answer.

On page 7 of the answer, the Examiner argues that Barry teaches the concept of a matched filtering in column 1. The Examiner provides a quote from Barry which is found in column 1, lines 40-43.

Upon a review of Barry, we find that Barry does teach that an ideal filter is a matched filter where the output signal-to-noise ratio is maximized. However, Barry does not provide any teaching on how an ideal filter may be obtained or in particular a method or apparatus for selecting an optimal filter based on most frequent occurring size of features in an original image. Furthermore, we fail to find any suggestion in Moorehead, Gonzales and Toriu to provide a method or apparatus which passes the original image through a first filter to smooth the image, performing a profile analysis of the smoothed image to determine the size of any feature in the original image, performing an analysis to determine the most frequently occurring size, selecting an optimal filter based on the most frequently occurring size and using the optimal filter to filter the original image to extract the most frequently occurring feature as recited in Appellant's claims 1 through 27. Therefore, we will not sustain the Examiner's rejection claims 1, 2, 6 through 8, 12 through 15 and 27 under 35 U.S.C. § 103 as being

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unpatentable over Barry, Moorehead and Gonzales as well as the Examiner's rejection of claims 3 through 5, 9 through 11 and 16 through 26 under 35 U.S.C. § 103 as being unpatentable over Barry, Moorehead, Gonzales and Toriu.

In view of the foregoing, the decision of the Examiner rejecting claims 28 through 30 under 35 U.S.C. § 103 is affirmed; however, the decision of the Examiner rejecting claims 1 through 27 under 35 U.S.C. § 103 is reversed.

No time period for taking any subsequent action in connection with this appeal may be extended under 37 CFR § 1.136(a).

AFFIRMED-IN-PART

JAMES D. THOMAS)	
Administrative Patent Judge)	
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)	BOARD OF PATENT
MICHAEL R. FLEMING)	APPEALS AND
Administrative Patent Judge)	INTERFERENCES
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