

UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE BOARD OF PATENT APPEALS
AND INTERFERENCES

Ex parte SANTHANA KRISHNAMACHARI

Appeal 2007-3328
Application 10/139,174
Technology Center 2600

Decided: March 19, 2008

Before JOSEPH F. RUGGIERO, ANITA PELLMAN GROSS, and JOHN A. JEFFERY, *Administrative Patent Judges*.

JEFFERY, *Administrative Patent Judge*.

DECISION ON APPEAL

Appellant appeals under 35 U.S.C. § 134 from the Examiner's rejection of claims 1-10, 16-30, and 37. Claims 11-15 and 31-36 have been indicated as containing allowable subject matter (Final Rejection 4). We have jurisdiction under 35 U.S.C. § 6(b). We affirm.

STATEMENT OF THE CASE

Appellant invented a system for transcoding compressed data streams, such as data streams conforming to MPEG standards. Specifically, the system examines motion information (e.g., motion vectors) to decide the importance of each macroblock. This importance information is then used to selectively apply a transcoding algorithm to each macroblock to reduce error propagation.¹ Claim 1 is illustrative:

1. A system for converting a stream of compressed video data to a required lower bit rate, comprising:

a system for determining an importance of each of a set of macroblocks in the stream based on a use of each macroblock as a reference macroblock; and

a system for selectively bit rate transcoding discrete cosine transform (DCT) blocks in the set of macroblocks based on the determined importance of each macroblock.

The Examiner relies on the following prior art references to show unpatentability:

Komiya	US 6,192,078 B1	Feb. 20, 2001
Mine	US 2002/0122481 A1	Sep. 5, 2002 (filed Jan. 23, 2002)

1. Claims 1-3 and 16-19 stand rejected under 35 U.S.C. § 102(e) as being anticipated by Mine.
2. Claims 4-10, 20-30, and 37 stand rejected under 35 U.S.C. § 103(a) as unpatentable over Mine and Komiya.

¹ See generally Spec. 1:5 - 2:17.

Rather than repeat the arguments of Appellant or the Examiner, we refer to the Brief and the Answer² for their respective details. In this decision, we have considered only those arguments actually made by Appellant. Arguments which Appellant could have made but did not make in the Brief have not been considered and are deemed to be waived. *See* 37 C.F.R. § 41.37(c)(1)(vii).

The Anticipation Rejection

The Examiner has indicated how the invention recited in claims 1-3 and 16-19 is deemed to be fully met by the disclosure of Mine (Ans. 3-4). Regarding independent claims 1 and 17,³ Appellant argues that Mine does not determine an importance of each of a set of macroblocks in a compressed video data stream based on using each macroblock as a *reference macroblock* as claimed. Rather, Appellant argues, Mine determines the importance level of a macroblock based on its *location*, namely (1) whether the macroblock is in a noticed region, and (2) the position of a slice. Appellant adds that Mine's macroblocks are not used as reference macroblocks, but rather are the objects of re-quantization (i.e., transcoding) (App. Br. 3-4).

The Examiner notes that when a certain macroblock belongs to a slice of the central portion and is a noticed region, the macroblock has high importance. According to the Examiner, this high importance macroblock

² We refer to the most recent Answer mailed December 19, 2006, throughout this opinion.

³ Appellant argues claims 1 and 17 together in connection with the group comprising claims 1-3 and 16-19 (App. Br. 3-4). We therefore select claim 1 as representative of this grouping. *See* 37 C.F.R. § 41.37(c)(1)(vii).

effectively constitutes a reference macroblock with respect to the rate controller's determination regarding the next macroblock (Ans. 5-6).

The Obviousness Rejection

Regarding claims 4-10, 20-30, and 37, the Examiner acknowledges the perceived differences between Mine and the claimed invention with respect to determining macroblock importance by examining motion vectors, but combines the teachings of Komiya with Mine to arrive at the claimed invention (Ans. 4-5). Regarding representative independent claim 27, Appellant argues that the cited references do not determine an importance of each of a set of macroblocks based on a use of each macroblock as a reference macroblock based on the motion vectors as claimed (App. Br. 6). The Examiner notes that examining motion vectors to evaluate macroblock importance is well known in the art as evidenced by Komiya (Ans. 6).

ISSUES

1. Has Appellant shown that the Examiner erred in finding the disclosure of Mine anticipates all limitations of representative claim 1? This issue turns on whether Mine expressly or inherently determines an importance of each of a set of macroblocks in a compressed video data stream based on using each macroblock as a reference macroblock as claimed.
2. Has Appellant shown that the Examiner erred in concluding that the limitations of representative claim 27 calling for, among other things, determining macroblock importance by examining motion vectors, would have been obvious to the ordinarily skilled artisan over the collective

teachings of Mine and Komiya? This issue turns on whether Appellant has persuasively rebutted the Examiner's *prima facie* case of obviousness based on these collective teachings.

FINDINGS OF FACT

At the outset, we note that the Examiner's findings regarding the specific teachings of the cited references (Ans. 3-5) are not in dispute except with respect to the disputed limitations noted above. Accordingly, we will adopt the Examiner's factual findings regarding the cited references as they pertain to the undisputed claim limitations.

Mine discloses a transcoding apparatus that converts first coded data obtained from moving pictures into second coded data without significantly degrading picture quality (Mine, ¶¶ 0012-14). In one implementation, the transcoding apparatus 30 receives the first coded data from a server 11 via a first network 12 at a first transmission rate. The transcoding apparatus then converts this data into second coded data that is compatible with a second, lower transmission rate used by a second network 22 that transfers the data to a terminal unit 21 (e.g., a personal computer) (Mine, ¶ 0060; Fig. 1).

The transcoder 30 is shown in detail in Figure 3. A key aspect of the transcoder's conversion function is its ability to detect "noticed" regions -- regions that a person easily notices⁴ -- and process these regions differently from regions that are not "noticed." To this end, the transcoder's rate controller 1 performs weighting so that fine quantization is performed on

⁴ See, e.g., Mine, Abstract and ¶ 0086.

macroblocks belonging to a slice⁵ which a person easily notices (e.g., the center of the screen). However, coarse quantization is performed on peripheral portions of the screen (Mine, ¶ 0086).

This technique is illustrated in Figures 8A and 8B. As shown in Figure 8A, a picture from a bitstream is divided into eight horizontal slices comprising ten macroblocks each. The picture includes an object region A1 and a background region A2 (Mine, ¶ 0090; Figs. 7, 8A).

To detect a “noticed” region, the system detects edges of the object region for a slice in terms of the corresponding macroblocks where the edges were detected. Figures 8A and 8B illustrate this process in connection with Slice 3. As shown in Figure 8A, macroblocks MB22 to MB26 belong to object region A1. Based on the detected DC-component difference values of the macroblocks in Slice 3, edges are detected in macroblocks MB22 and MB27 (Mine, ¶ 0092; Fig. 8A). After this edge detection process, the value “1” is mapped to a memory area corresponding to macroblocks MB22 and MB27 as shown in Figure 8B. The value “0” is mapped to all other memory areas (Mine, ¶ 0092; Fig. 8B).

After this mapping is conducted on each slice, the rate controller refers to the results of this mapping process to determine whether a noticed region exists. If two or more edges are detected, there is a noticed region; otherwise, there are no noticed regions (Mine, ¶ 0093).

If a noticed region exists, then it is specified according to predetermined conditions. In Slice 3, for example, the region from MB22 to

⁵ According to MPEG standards, one horizontal line of a picture is a “slice.” Each slice comprises multiple macroblocks (Mine, ¶ 0081). See, e.g., Mine, at Fig. 4 (illustrating 11 macroblocks per slice of picture).

MB26 (i.e., the macroblock with the first detected edge to the macroblock just precedent to the macroblock with the second detected edge) is deemed as a noticed region (Mine, ¶ 0094).

In one implementation, the level of importance of each macroblock is also determined based on whether the macroblock is in a noticed region and the position of a slice (Mine, ¶¶ 0097-98; Fig. 9). This macroblock importance determination is summarized below:

Macroblock Importance	Slice in Central Portion?	Macroblock in Noticed Region?
High	Yes	Yes
Medium	Yes	No
Low	No	No

Table 1: Summary of Macroblock Importance Determination in Mine

Based on the results of this determination, the higher the importance of a macroblock, the more finely the quantization is performed thereon (Mine, ¶¶ 0098-99).

PRINCIPLES OF LAW

“Anticipation is established only when a single prior art reference discloses, expressly or under the principles of inherency, each and every element of a claimed invention” as well as disclosing structure which is capable of performing the recited functional limitations. *RCA Corp. v. Applied Digital Data Systems, Inc.*, 730 F.2d 1440, 1444 (Fed. Cir. 1984);

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W.L. Gore and Associates, Inc. v. Garlock, Inc., 721 F.2d 1540, 1554 (Fed. Cir. 1983).

In rejecting claims under 35 U.S.C. § 103, it is incumbent upon the Examiner to establish a factual basis to support the legal conclusion of obviousness. *See In re Fine*, 837 F.2d 1071, 1073 (Fed. Cir. 1988). In so doing, the Examiner must make the factual determinations set forth in *Graham v. John Deere Co.*, 383 U.S. 1, 17 (1966). If that burden is met, the burden then shifts to the Appellant to overcome the prima facie case with argument and/or evidence. Obviousness is then determined on the basis of the evidence as a whole and the relative persuasiveness of the arguments. *See In re Oetiker*, 977 F.2d 1443, 1445 (Fed. Cir. 1992).

ANALYSIS

The Anticipation Rejection

Based on the functionality of Mine as we noted in the Findings of Fact above, we find that Mine's importance determination is based on a use of each macroblock as a reference macroblock as claimed. As noted in Table 1 above, the importance level in Mine depends on whether a macroblock is in a noticed region. But the determination of a noticed region is based upon the particular position of each macroblock with respect to the detected edges of the object region and the resulting mapping process. *See, e.g.*, Mine, Figs. 8A-8B.

Therefore, each macroblock is effectively used as a "reference" in this process at least with respect to determining the relative location of the noticed region -- a determination made in terms of macroblocks. Since the importance determination is dependent on this noticed region determination,

determining importance is therefore based on, at least in part, a use of each macroblock as a reference macroblock.

Furthermore, nothing in representative claim 1 precludes the Examiner's interpretation (Ans. 5- 6) of a given macroblock effectively functioning as a "reference" macroblock at least with respect to the following macroblock in the rate controller's macroblock-by-macroblock determination of importance. In proceeding from one macroblock to another to determine its importance, we agree with the Examiner that the previous macroblock would effectively function as a "reference" at least with respect to the next macroblock examined.⁶

For the foregoing reasons, we will sustain the Examiner's rejection of representative claim 1 and claims 2, 3, and 16-19 which fall with claim 1.

The Obviousness Rejection

Regarding the obviousness rejection of claims 4-10, 20-30, and 37, we find that the Examiner has established at least a *prima facie* case of obviousness of those claims that Appellant has not persuasively rebutted. Specifically, the Examiner has (1) pointed out the teachings of Mine, (2) noted the perceived differences between Mine and the claimed invention, and (3) reasonably indicated how and why Mine would have been modified

⁶ In reaching this conclusion, we note that term "reference macroblock" has not been specifically defined in the Specification nor is there any evidence on this record that the term has a special meaning apart from its plain meaning. Accordingly, absent a specific definition, we construe the term with its plain meaning (i.e., the ordinary and customary meaning given to the term by those of ordinary skill in the art). *See Brookhill-Wilk I, LLC. v. Intuitive Surgical, Inc.*, 334 F.3d 1294, 1298 (Fed. Cir. 2003); *see also Phillips v. AWH Corp.*, 415 F.3d 1303, 1312 (Fed. Cir. 2005) (en banc).

by the teachings of Komiya to arrive at the claimed invention (Ans. 4-6). Once the Examiner has satisfied the burden of presenting a prima facie case of obviousness, the burden then shifts to Appellant to present evidence or arguments that persuasively rebut the Examiner's prima facie case.

Appellant did not persuasively rebut the Examiner's prima facie case of obviousness, but merely alleged that the cited references did not disclose or suggest the limitations of representative claim 27 calling for, among other things, determining macroblock importance by examining motion vectors (App. Br. 6). Apart from this argument, however, Appellant did not specifically point out or explain why the Examiner's position relying on the collective teachings of Mine and Komiya was deficient. Since Appellant has not specifically shown error in the Examiner's prima facie case of obviousness of representative claim 27, the rejection is therefore sustained.

For the foregoing reasons, we will sustain the Examiner's rejection of representative claim 27 and claims 4-10, 21-26, 28-30, and 37 which fall with claim 27.

CONCLUSIONS OF LAW

For the foregoing reasons, Appellant has not shown that the Examiner erred in finding the disclosure of Mine anticipates all limitations of representative claim 1. Moreover, Appellant has not shown that the Examiner erred in concluding that the limitations of representative claim 27 would have been obvious to the ordinarily skilled artisan over the collective teachings of Mine and Komiya.

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DECISION

We have sustained the Examiner's rejections with respect to all claims on appeal. Therefore, the Examiner's decision rejecting claims 1-10, 16-30, and 37 is affirmed.

No time period for taking any subsequent action in connection with this appeal may be extended under 37 C.F.R. § 1.136(a)(1)(iv).

AFFIRMED

gvw

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