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UNITED STATES PATENT AND TRADEMARK OFFICE

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BEFORE THE PATENT TRIAL AND APPEAL BOARD

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*Ex parte* RADEK GRZESZCZUK, VIJAY CHANDRASEKHAR,  
GABRIEL TAKACS, and BERND GIROD

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Appeal 2016-000476  
Application 12/617,514  
Technology Center 2600

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Before ALLEN R. MacDONALD, JOHN P. PINKERTON, and  
GARTH D. BAER, *Administrative Patent Judges*.

PINKERTON, *Administrative Patent Judge*.

DECISION ON APPEAL

Appellants<sup>1</sup> appeal under 35 U.S.C. § 134(a) from the Examiner's Final Rejection of claims 1–3, 6–9, and 11–12. Claims 13–20 are allowed. Claims 4 and 10 are objected to as being dependent upon a rejected base claim, but are indicated as being allowable if rewritten in independent form including all the limitations of the base claim and any intervening claims. We have jurisdiction under 35 U.S.C. § 6(b).

We affirm.

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<sup>1</sup> The real party in interest identified by Appellants is the assignee, Nokia Corporation, Inc. Appeal Br. 2.

STATEMENT OF THE CASE

*Introduction*

Appellants' described and claimed invention relates generally to generating a plurality of compressed feature descriptors, comparing a compressed representation of a feature descriptor with a plurality of compressed representations of feature descriptors of respective predefined features, and identifying the respective feature descriptor. Abstract.<sup>2</sup>

Claim 1 is representative and reads as follows (with the disputed limitations *emphasized*):

1. A method comprising:

*dividing an image into a plurality of image regions;*

*determining a plurality of gradients for each of a plurality of cells of an image region, wherein the image region is divided into the plurality of cells prior to determining the plurality of gradients;*

*assigning the gradients for a respective cell to a respective one of a plurality of bins;*

*determining a plurality of feature descriptors, wherein each feature descriptor includes a representation of a distribution of gradients between the plurality of bins of a respective cell; and*

*compressing the plurality of feature descriptors comprising the gradient distributions of the respective cells.*

Appeal Br. 11 (Claims App.).

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<sup>2</sup> Our Decision refers to the Final Office Action (mailed Dec. 18, 2014, "Final Act."), Appellants' Appeal Brief (filed May 18, 2015, "Appeal Br."), the Examiner's Answer (mailed July 31, 2015, "Ans."), and the original Specification (filed Nov. 12, 2009, "Spec.").

*Rejections on Appeal*

Claims 1–3 and 7–9 stand rejected under 35 U.S.C. § 103(a) as being unpatentable over Brandt et al. (US 8,054,170 B1, issued Nov. 8, 2011) (“Brandt”), in view of Takacs et al., *Outdoors Augmented Reality on Mobile Phone using Loxel-Based Visual Feature Organization*, MIR’08 October 30–31, 2008 (“Takacs”).

Claims 6 and 12 stand rejected under 35 U.S.C. § 103(a) as being unpatentable over Brandt, in view of Takacs, and further in view of Samadani et al. (US 2008/0144124 A1, published June 19, 2008) (“Samadani”).

ANALYSIS

We have reviewed the Examiner’s rejections in light of Appellants’ arguments in the Appeal Brief (*see* App. Br. 4–10) and are not persuaded that the Examiner has erred. Unless otherwise noted, we adopt as our own the findings and reasons set forth by the Examiner in the Office Action from which this appeal is taken (Final Act. 2–8) and in the Examiner’s Answer (Ans. 2–6), and we concur with the conclusions reached by the Examiner. For emphasis, we consider and highlight specific arguments as presented in the Appeal Brief.

*Rejection of Claim 1<sup>3</sup> under § 103(a)*

Appellants argue Brandt fails to disclose “dividing an image into a plurality of image regions.” *See* Appeal Br. 5–6. More specifically,

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<sup>3</sup> We decide the rejection of claims 2–3, 6–9, and 11–12, which are argued together as a group, on the basis of representative claim 1. *See* 37 C.F.R. § 41.37(c)(1)(iv).

Appellants argue Brandt merely discloses portioning an image patch corresponding to a known feature descriptor, and fails to disclose or suggest dividing an image into a plurality of regions, so that gradients may be determined for the cells in each image region for which a plurality of feature descriptors may be determined. *See* Appeal Br. 6.

We do not find this argument persuasive. We agree with the Examiner that Brandt teaches partitioning an image patch into sub-patches. *See* Final Act. 2 (citing Brandt col. 9, ll. 36–46); *see also* Ans. 3–4 (citing Brandt col. 4, ll. 3–19). Thus, we agree with the Examiner that Brandt teaches or suggests the aforementioned claim limitation.

Appellants further argue Brandt also fails to disclose “determining a plurality of gradients for each of a plurality of cells of an image region, wherein the image region is divided into the plurality of cells prior to determining the plurality of gradients.” *See* Appeal Br. 6–7. More specifically, Appellants argue Brandt merely discloses a feature descriptor space is decomposed into four sub-spaces. *See* Appeal Br. 6. Appellants further argue the portion of Brandt cited by the Examiner does not disclose further sub-dividing quadrants into four sub-spaces, as asserted by the Examiner, but instead, describes an alternative spatial partitioning that divides an image patch into four quadrants instead of 16 sub-patches as described in an earlier portion of the reference. *See* Appeal Br. 6–7.

We do not find this argument persuasive either. We agree with the Examiner that Brandt teaches dividing an image patch into 16 sub-patches and computing an eight-dimension gradient histogram for each sub-patch, where, for each pixel in a sub-patch, a gradient is computed. *See* Final Act. 2 (citing Brandt col. 9, ll. 36–46; Fig. 6A); *see also* Brandt col. 9,

ll. 17–28. Thus, we agree with the Examiner that Brandt teaches or suggests the aforementioned claim limitation. Appellants’ argument that Brandt fails to disclose sub-dividing quadrants into four sub-spaces is not commensurate with the scope of claim 1, because we conclude the claim does not require the “image region” that is “divided into a plurality of cells” to necessarily be one of the “plurality of image regions” that an image is “divide[d] . . . into.” Thus, Appellants’ argument is not persuasive.<sup>4</sup>

Appellants additionally argue Brandt also fails to disclose “assigning the gradients for a respective cell to a respective one of a plurality of bins.” *See* Appeal Br. 7. More specifically, Appellants argue Brandt fails to disclose “determining a plurality of gradients for each of a plurality of cells of an image region,” because Brandt merely discloses a feature descriptor space is decomposed into four sub-spaces. *See id.* Thus, as argued by Appellants, Brandt cannot teach assigning such gradients for a respective cell to a respective one of a plurality of bins. *See id.*

We do not find this argument persuasive. As described above, we agree with the Examiner that Brandt teaches “determining a plurality of gradients for each of a plurality of cells of an image region.” *See* Final Act. 2. We further agree with the Examiner that Brandt teaches binning the

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<sup>4</sup> Even assuming *arguendo* that claim 1 requires the “image region” that is “divided into a plurality of cells” to be one of the “plurality of image regions” that an image is “divide[d] . . . into,” Appellants’ argument would still not be persuasive, as we agree with the Examiner that Brandt’s teaching of an alternative spatial partitioning of an image patch (in addition to an original spatial partitioning of an image patch into 16 sub-patches), where the image patch is divided into four quadrants, and where each quadrant contains four of the original sub-patches, teaches the aforementioned claim limitation. *See* Final Act. 2 (citing Brandt col. 9, ll. 36–46; Fig. 6A); *see also* Ans. 4.

determined gradients per direction, and thus, we agree Brandt also teaches “assigning the gradients for a respective cell to a respective one of a plurality of bins.” *See* Final Act. 3; *see also* Ans. 4–5 (citing Brandt col. 9, ll. 25–28).

Appellants further argue Brandt fails to disclose “determining a plurality of feature descriptors, wherein each feature descriptor includes a representation of a distribution of gradients between the plurality of bins of a respective cell.” *See* Appeal Br. 5, 7–8. More specifically, Appellants argue Brandt fails to disclose “determining a plurality of gradients for each of a plurality of cells of an image region,” because Brandt merely discloses a feature descriptor space is decomposed into four sub-spaces. *See* Appeal Br. 7. Thus, as argued by Appellants, Brandt cannot teach determining a plurality of feature descriptors, wherein each feature descriptor includes a representation of a distribution of gradients between the plurality of bins of a respective cell. *See* Appeal Br. 7–8. Appellants also argue Brandt merely discloses receiving feature descriptors that have been previously determined, and thus, does not teach or suggest determining the plurality of feature descriptors. *See* Appeal Br. 5.

We do not find these arguments persuasive. As described above, we agree with the Examiner that Brandt teaches “determining a plurality of gradients for each of a plurality of cells of an image region.” *See* Final Act. 2. Thus, Appellants’ argument that Brandt cannot teach determining feature descriptors that include a representation of a distribution of gradients between bins of a respective cell is not persuasive. Further, we disagree with Appellants that Brandt merely discloses receiving pre-determined feature descriptors, and we agree with the Examiner that, in addition to receiving pre-determined feature descriptors, Brandt also teaches

determining feature descriptors. *See* Ans. 2–3 (citing Brandt col. 4, ll. 3–19). Thus, we agree with the Examiner that Brandt also teaches “determining a plurality of feature descriptors, wherein each feature descriptor includes a representation of a distribution of gradients between the plurality of bins of a respective cell.”

Accordingly, we sustain the Examiner’s rejection of independent claim 1. We further sustain the Examiner’s rejection of independent claim 7, and dependent claims 2–3, 6, 8–9, and 12, which are not argued separately.

#### DECISION

We affirm the Examiner’s decision rejecting claims 1–3, 6–9, and 12 under 35 U.S.C. § 103(a).

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