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UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE PATENT TRIAL AND APPEAL BOARD

Ex parte KAZUSHI SATO¹

Appeal 2018-005768
Application 13/264,320
Technology Center 2400

Before JASON V. MORGAN, JOSEPH P. LENTIVECH, and
DAVID J. CUTITTA II, *Administrative Patent Judges*.

CUTITTA, *Administrative Patent Judge*.

DECISION ON APPEAL

This is an appeal under 35 U.S.C. § 134(a) from the Final Rejection of claims 19–24, 26–32, and 34–38, all the pending claims in the present application. *See* Appeal Br. 2. We have jurisdiction over the appeal under 35 U.S.C. § 6(b).

We AFFIRM.

¹ Appellant names Sony Corporation as the real party in interest. *See* Appeal Br. 3.

STATEMENT OF THE CASE

Invention

Appellant indicates the invention relates to “image processing . . . [that] enable[s] encoding efficiency in intra prediction to be improved.” Spec., Abstract.²

Exemplary Claim

Claims 19, 26, 27, 34, 35, and 36 are independent claims. Claim 19 is exemplary and is reproduced below with limitations at issue emphasized:

19. An image processing device comprising:

a phase shift unit configured to select, in accordance with a direction of an intra prediction mode, whether or not to horizontally shift a phase of an upper adjacent pixel adjacent to an intra prediction block as a reference pixel of intra prediction according to a shift amount corresponding to the direction of the intra prediction mode;

a prediction image generating unit configured to perform the intra prediction using the upper adjacent pixel as the reference pixel and to generate a prediction image of the intra prediction block; and

an encoding unit configured to encode the intra prediction block using the prediction image generated by the prediction image generating unit,

wherein an interpolated pixel is generated as the reference pixel of intra prediction and the interpolated pixel falls between the upper adjacent pixel and another upper adjacent pixel that is horizontally adjacent to the upper adjacent

² This Decision refers to: (1) Appellant’s Specification (“Spec.”) filed October 13, 2011; (2) the Final Office Action (“Final Act.”) mailed July 15, 2016; (3) the Appeal Brief (“Appeal Br.”) filed March 10, 2017; (4) the Examiner’s Answer (“Ans.”) mailed March 12, 2018; and (5) the Reply Brief (“Reply Br.”) filed May 14, 2018.

pixel in a condition that the phase shift unit selects to horizontally shift the phase of the upper pixel adjacent to the intra prediction block.

REFERENCES AND REJECTIONS

Claims 19–22, 26–30, and 34–36 stand rejected under 35 U.S.C. § 103(a) as being unpatentable over the combination of Drugeon et al., *High Precision Edge Prediction for Intra Coding*, ICIP, 15th IEEE International Conference on Image Processing ICIP, pp. 1620–23 (2008) (“Drugeon”) in view of Zhou et al., *An Interpolation Method by Prediction the Direction of Pixel Texture Changing Trend for H.264/AVC Intra Prediction*, Second International Symposium on Intelligent Information Technology Application IITA, Vol. 1, IEEE, pp. 884–88, (2008) (“Zhou”). Final Act. 4–14.

Claims 23, 24, 31, 32, 37, and 38 stand rejected under 35 U.S.C. § 103(a) as being unpatentable over the combination of Drugeon, Zhou, and Thoreau et al. (WO 2007/093629 A1; pub. Aug. 23, 2007) (“Thoreau”). Final Act. 14–20.

Our review in this appeal is limited only to the above rejections and the issues raised by Appellant. Arguments not made are waived. See 37 C.F.R. § 41.37(c)(1)(iv) (2016).

ANALYSIS

We refer to, rely on, and adopt the Examiner’s findings and conclusions, insofar as they relate to issues raised in this appeal, as set forth in the Office Action and Answer. See Final Act; 3–8; Ans. 2–3. Our discussion here will be limited to the following points of emphasis.

Issue: Does the Examiner err in finding the combination of Zhou and Dugeon teaches or suggests

a phase shift unit configured to select, in accordance with a direction of an intra prediction mode, whether or not to horizontally shift a phase of an upper adjacent pixel adjacent to an intra prediction block as a reference pixel of intra prediction according to a shift amount corresponding to the direction of the intra prediction mode,

as recited in independent claim 19?

Appellant disputes the Examiner's factual findings. Appellant argues that "Dugeon does not at all consider *the intra prediction mode* in making a determination **to select whether or not** an adjacent pixel is to be linearly interpolated, because [i]n Dugeon, the linear prediction *is always made* such that the prediction result is calculated based on the angle α ." Appeal Br. 14; *see* Reply Br. 4–5. Appellant further argues "Dugeon is also silent as to any 'shift amount' corresponding to the direction of the intra prediction mode, for which a phase of an adjacent pixel is selected to be shifted *in accordance with the direction of the intra prediction mode*."

We find these arguments unpersuasive because the Examiner's findings are supported by a preponderance of the evidence. The Examiner finds "Dugeon directly teaches that the system chooses which adjacent pixels are to be horizontally interpolated according to the intra prediction mode" and "[t]hese selected adjacent pixels are in accordance with a direction of the intra prediction mode." Ans. 2, 3 (citing Dugeon § 3, pgs. 1621–22). The Examiner further finds "Dugeon teaches that this horizontal phase shift is done according to a shift amount corresponding to the direction of the intra prediction mode . . . [and] [t]here, Dugeon teaches determining a shift amount based on the direction of the intra prediction

mode.” Ans. 2–3 (citing Drugeon § 3, pgs. 1621–22). That is, the Examiner finds, and we agree, that Drugeon’s selection of surrounding pixels a and b for linear interpolation along an X coordinate is performed in accordance with a direction of an intraprediction mode. *See* Ans. 2–3. Moreover, *any* interpolation amount along the X-axis of the pixels in Drugeon is sufficient to suggest Appellant’s broad recitation of “a shift amount.” Appellant’s arguments, thus, fail to establish persuasively that the Examiner’s factual findings from Drugeon are erroneous.

We, therefore, sustain the Examiner’s 35 U.S.C. § 103(a) rejection of claim 19. We also sustain, for similar reasons, the Examiner’s § 103(a) rejections of independent claims 26, 27, 34, 35, and 36, which are not argued separately from independent claim 19. *See* Appeal Br. 18. Dependent claims 20–24, 28–32, 37, and 38 are not argued separately, or are nominally argued separately, and fall with their respective independent claims. *Id.*

DECISION

We affirm the Examiner’s § 103(a) rejections of claims 19–24, 26–32, and 34–38.

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