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Paper 20
Entered: July 16, 2021

UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE PATENT TRIAL AND APPEAL BOARD

UNIFIED PATENTS, LLC,
Petitioner,

v.

ELECTRONICS AND TELECOMMUNICATIONS RESEARCH INSTITUTE, KWANGWOON UNIVERSITY RESEARCH INSTITUTE FOR INDUSTRY CORPORATION, and INDUSTRY-ACADEMIA COOPERATION GROUP OF SEJONG UNIVERSITY,
Patent Owner.

IPR2021-00368
Patent 9,736,484 B2

Before JAMESON LEE, SALLY C. MEDLEY, and NATHAN A. ENGELS, *Administrative Patent Judges.*

ENGELS, *Administrative Patent Judge*.

DECISION
Denying Institution of *Inter Partes* Review
35 U.S.C. § 314, 37 C.F.R. § 42.4

I. INTRODUCTION

Petitioner Unified Patents, LLC filed a Petition (Paper 2 ("Pet.")) for *inter partes* review of claim 4 of U.S. Patent No. 9,736,484 B2 (Ex. 1001, "the '484 patent"). Electronics and Telecommunications Research Institute, Kwangwoon University Research Institute for Industry Cooperation, and Industry-Academia Cooperation Group of Sejong University (collectively, "Patent Owner"), filed a Preliminary Response. Paper 10 ("Prelim. Resp.").

Under 35 U.S.C. § 314(a), an *inter partes* review may not be instituted unless the information presented in the Petition and any response thereto show "there is a reasonable likelihood that the petitioner would prevail with respect to at least 1 of the claims challenged in the petition." Upon consideration of the Petition and the evidence of record, we determine that Petitioner has not demonstrated a reasonable likelihood of prevailing in establishing unpatentability of at least one claim of the '484 patent.

A. Related Matters

The parties indicate that the '484 patent is not the subject of any related administrative or judicial proceedings. *See* Pet. 73; Paper 3, 1.

B. Real Parties in Interest

Petitioner identifies itself as the real party-in-interest for Petitioner. Pet. 73. Patent Owner identifies itself as the real parties-in-interest for Patent Owner. Paper 3, 1.

Patent Owner contends that at least Apple Inc. should have been identified as a real party-in-interest by Petitioner and that the Petition should be denied pursuant to 35 U.S.C. § 312(a) for failing to identify all real parties-in-interest. *See* Prelim. Resp. 49–56. Because we determine Petitioner has not demonstrated a reasonable likelihood of prevailing in establishing unpatentability, we do not reach this issue.

C. The '484 Patent

Titled, "Apparatus for Encoding and Decoding Image Using Adaptive DCT Coefficient Scanning Based on Pixel Similarity and Method Thereof," the '484 patent relates generally to an encoding/decoding apparatus and method using an adaptive Discrete Cosine Transformation ("DCT") coefficient scanning based on pixel similarity. Ex. 1001, (54), 1:26–29. More particularly, the '484 patent describes an encoding/decoding apparatus and method which performs intra prediction onto input video, predicts pixel similarity based on pixel similarity information of coefficients to be encoded that is acquired from adjacent pixels in the intra-predicted video, and performs scanning (*e.g.*, DCT coefficient scanning) according to the predicted pixel similarity. *Id.* at 1:30–36.

Copied below is Figure 5 of the '484 patent.

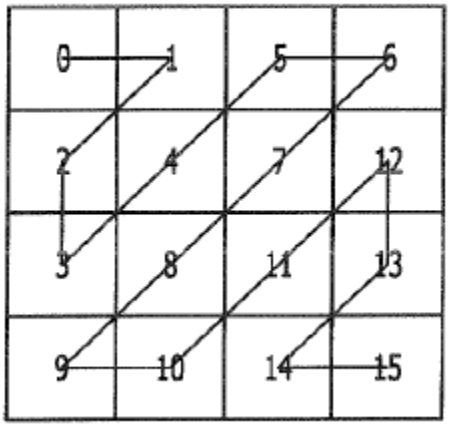

Figure 5 illustrates a typical zigzag scanning method. *Id.* at 5:51–52. The zigzag scanning method is devised in consideration that low frequency components of transformed coefficients acquired from the DCT and quantization are highly likely to be positioned in the upper left part of a two-dimensional plane. *Id.* at 5:56–60.

Copied below is Figure 6 of the '484 patent.

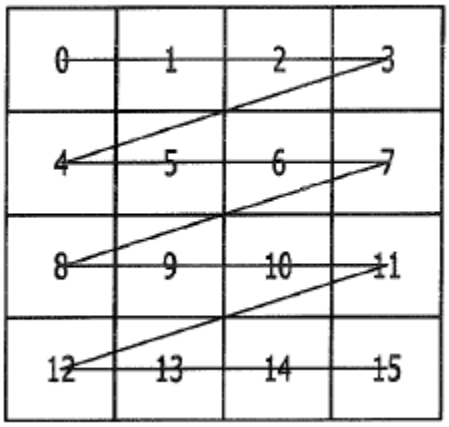

Figure 6 illustrates a typical horizontal scanning method. *Id.* at 5:52–54. The horizontal prediction mode is selected as an optimal mode when the pixel similarity in the horizontal direction is high. *Id.* at 6:16–18.

Copied below is Figure 7 of the '484 patent.

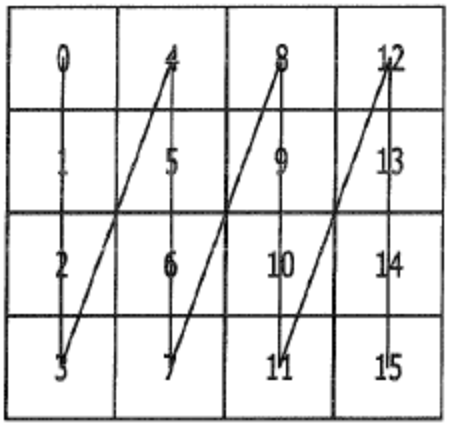

Figure 7 illustrates a typical vertical scanning method. *Id.* at 5:54–55. The vertical prediction mode is selected as an optimal mode in a rate-distortion optimization process when the pixel similarity in the vertical direction is high. *Id.* at 6:9–11.

Copied below is Figure 11 of the '484 patent.

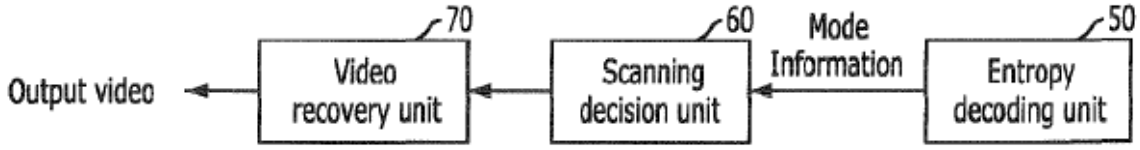

Figure 11 is a block view showing a decoding apparatus using an adaptive DCT coefficient scanning based on pixel similarity. *Id.* at 8:41–43. The decoding apparatus includes an entropy decoding unit 50, a scanning decision unit 60, and a video recovery unit 70. *Id.* at 8:45–48. The entropy decoding unit 50 receives an encoded video bitstream encoded in the encoding apparatus of Figure 4 using an adaptive DCT coefficient scanning based on pixel similarity and decodes it through an entropy decoding method. *Id.* at 8:49–52. Then, the entropy decoding unit 50 transmits the entropy-decoded video bitstream to the scanning decision unit 60. *Id.* at 8:53–55. The scanning decision unit 60 decides a scanning method for the coefficients decoded in the entropy decoding unit 50 according to an intra prediction mode. *Id.* at 8:56–59. The video recovery unit 70 finally recovers the coefficients by using the scanning method decided in the scanning decision unit 60 to recover the video. *Id.* at 8:60–62.

D. Challenged Claim

Claim 4, the only claim challenged in this proceeding, is reproduced below with formatting and bracketed labels added for clarity.

4. [4a] A non-transitory computer-readable storage medium storing instructions that, when executed by a processor, cause the processor to perform a method of decoding, the method comprising:

   [4b] performing entropy decoding of encoded video information in a bitstream to obtain transform coefficients for a current block;

   [4c] selecting a scanning mode for the transform coefficients; and

   [4d] scanning the transform coefficients based on the selected scanning mode;

   wherein the selecting of a scanning mode comprises:

   [4c1] selecting a horizontal scanning mode in response to the intra prediction mode being a vertical intra prediction mode; and

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