

UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE PATENT TRIAL AND APPEAL BOARD

HUAWEI DEVICE CO., LTD.,

Petitioner,

v.

OPTIS WIRELESS TECHNOLOGY, LLC,

Patent Owner.

Case IPR2018-00658
Patent 7,769,238 B2

Before MIRIAM L. QUINN, PATRICK M. BOUCHER, and
JOHN P. PINKERTON, *Administrative Patent Judges*.

PINKERTON, *Administrative Patent Judge*.

DECISION
Denying Institution of *Inter Partes* Review
35 U.S.C. § 314(a)

I. INTRODUCTION

Huawei Device Co., Ltd. (“Petitioner”) filed a Petition for *inter partes* review of claim 1 of U.S. Patent No. 7,769,238 B2 (Ex. 1001, “the ’238 patent”). Paper 1 (“Pet.”). Optis Wireless Technology, LLC (“Patent Owner”) filed a Preliminary Response. Paper 8 (“Prelim. Resp.”).

Institution of an *inter partes* review is authorized by statute when “the information presented in the petition . . . and any response . . . shows that there is a reasonable likelihood that the petitioner would prevail with respect to at least 1 of the claims challenged in the petition.” 35 U.S.C. § 314(a). For the reasons discussed below, we deny institution of *inter partes* review of claim 1 of the ’238 patent.

A. *Related Proceedings*

Patent Owner, and its related entities, have asserted the ’238 patent in *Optis Wireless Tech., LLC, et al. v. Huawei Device USA Inc., et al.*, Case No. 2:17-cv-00123-JRG (E.D. Tex.) (the “Litigation”). Pet. 3.

B. *The ’238 Patent*

The ’238 patent, entitled “Picture Coding Method and Picture Decoding Method,” issued on August 3, 2010, and claims priority to Japanese application 2001-112665, filed on April 15, 2002. Ex. 1001, 1.

The ’238 patent relates to the encoding and decoding of video. Ex. 1001, 1:12–14. The video encoder divides a picture into blocks and performs intra-picture prediction and inter-picture prediction for each block to create predictive residual picture data, a “residual block image.” *Id.* at 1:19–21; 8:34–46. The coding process then applies orthogonal transformation using, for example, a discrete cosine transform (DCT), and

quantization, on the residual block image. *Id.* at 1:19–27; 8:47–50. The ’238 patent explains that quantization of the orthogonal transformed data “creates coefficients showing spatial frequency components which is an object for variable length coding.” *Id.* at 7:40–43; 8:50–52. After the transformation and quantization processes are performed on each residual image block, the number of coefficients in each block having a value other than 0, *i.e.*, non-zero coefficients, is detected and stored. *Id.* at 8:55–58.

The ’238 patent states that, under the conventional method, only one variable length code (VLC) table was used to encode the values of each coefficient in the current block. *Id.* at 1:28–44. According to the ’238 patent, this technique was inefficient. *Id.* To improve coding efficiency, the ’238 patent describes a system that encodes the total number of non-zero coefficients for each block (in addition to the values of the coefficients) using a VLC table that is selected from among several available VLC tables. *Id.* at 1:45–52. The ’238 patent teaches that the VLC table is selected based on a “predictive value” for the number of non-zero coefficients in a block located on the periphery of the block being encoded. *Id.* at 1:67–2:10. More specifically, the ’238 patent describes a “coefficient number encoder” that: (1) predicts the total number of non-zero coefficients in the current block based on the number of non-zero coefficients in one or more blocks located on the periphery of the current block; (2) selects a VLC table based on that prediction; and (3) encodes the total number of non-zero coefficients in the current block using the selected VLC table. *Id.* at 1:63–2:10; 8:55–62.

As explained in the '238 patent, in the decoding process, inverse quantization and inverse orthogonal transformation are performed on the coefficients to reconstruct the residual block image. *Id.* at 21:54–22:29. The decoder described in the patent includes a “coefficient number decoder,” which predicts the total number of non-zero coefficients in the block being decoded, uses that value to select a VLC table, and employs the selected VLC table to decode the total number of non-zero coefficients in the block. *Id.* at 3:21–42.

As recited in claim 1, the coefficient number decoding unit includes a “determining unit configured to determine a predictive value for the number of non-zero coefficients included in the current block based on the number of non-zero coefficients included in a decoded block located on a periphery of the current block.” *See id.* at 38:49–53. Figures 4A and 4B of the '238 patent, which are reproduced below, illustrate the claimed relationship of a “decoded block located on a periphery of the current block.”

Fig. 4A

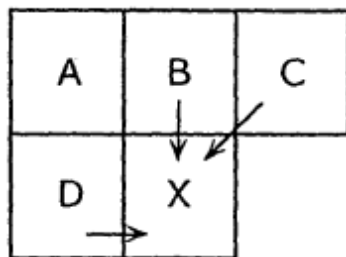
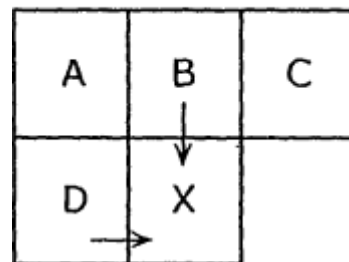


Fig. 4B



Figures 4A and 4B are pattern diagrams showing a physical position of a current block to be coded, labeled “X,” and the coded blocks used for the reference. *Id.* at 5:11–13. In both figures, identical square blocks

labeled “A,” “B,” and “C” are located next to each other in a top row and two identical square blocks labeled “D” and “X” are located next to each other in a row below the top row, with blocks “D” and “X” directly under blocks “A” and “B.” Figure 4A presents a case of using three adjacent blocks, whereas Figure 4B presents a case of using two adjacent blocks. *Id.* at 13–15; 9:34–37; 13:22–26.

C. Challenged Claim

Independent claim 1, which is the challenged claim and the only claim in the ’238 patent, is reproduced below (with paragraph lettering added as in the Petition):

1. A receiving apparatus which receives multiplexed data which is obtained by multiplexing coded audio data and coded picture data, said receiving apparatus comprising:

[1a] a demultiplexing unit configured to separate the multiplexed data into the coded audio data and the coded picture data;

[1b] an audio processing unit configured to decode the separated coded audio data; and

[1c] a picture decoding unit configured to decode the separated coded picture data;

[1d] wherein said picture decoding unit includes a block decoding unit configured to decode coded block data included in the coded picture data, the coded block data being obtained by dividing a picture signal into plural blocks, generating a residual block image from a block image of the respective blocks and a predictive block image obtained by intra-picture prediction or inter-picture prediction, and coding, on a block basis, coefficients obtained by performing orthogonal transformation and quantization on the residual block image,

[1e] said block decoding unit includes:

a coefficient number decoding unit configured to decode the coded block data to obtain the number of non-zero coefficients which are coefficients included in a current block to be decoded and having a value other than “0”;

[1f] a unit configured to obtain coefficients corresponding to a residual block image of the current block by decoding the coded block data;

[1g] a unit configured to obtain the residual block image of the current block by performing inverse quantization and inverse orthogonal transformation on the coefficients corresponding to the residual block image of the current block; and

[1h] a reproducing unit configured to reproduce a block image of the current block, from the obtained residual block image and a predictive block image obtained by intra-picture prediction or inter-picture prediction,

[1i] said coefficient number decoding unit includes:

a determining unit configured to determine a predictive value for the number of non-zero coefficients included in the current block based on the number of non-zero coefficients included in a decoded block located on a periphery of the current block;

[1j] a selecting unit configured to select a variable length code table based on the determined predictive value; and

[1k] a variable length decoding unit configured to perform variable length decoding on a coded stream which is generated by coding the number of the non-zero coefficients included in the current block, by using the selected variable length code table.

Ex. 1001 at 38:10–60.

D. Evidence of Record

Petitioner relies upon the following references, as well as the Declaration of Dr. Dan Schonfeld (Ex. 1008):

Exhibit	Reference	Publication or Filing Date
Ex. 1003	H.324 (ITU-T Recommendation H.324)	February 1998
Ex. 1004	H.263 (ITU-T Recommendation H.263)	February 1998
Ex. 1005	JVT-B045 (“Improved Low Complexity Entropy Coding for Transform Coefficients,” Bjontegaard, Gisle)	January 23, 2002
Ex. 1006	Bjontegaard (U.S. Patent 7,099,387 B2)	Filed August 30, 2002; provisional filed March 22, 2002

E. Asserted Grounds of Unpatentability

Petitioner challenges the patentability of claim 1 of the ’238 patent based on the following grounds under 35 U.S.C. § 103:

Reference(s)	Basis	Claim Challenged
Combination of H.324, H.263, and JVT-B045	§ 103	1
Combination of H.324, H.263, and Bjontegaard	§ 103	1

II. DISCUSSION

A. Claim Construction

1. Applicable Law

In an *inter partes* review, claim terms in an unexpired patent are interpreted according to their broadest reasonable construction in light of the specification of the patent in which they appear. 37 C.F.R. § 42.100(b); *see In re Cuozzo Speed Techs., LLC v. Lee*, 136 S. Ct. 2131, 2144–46 (2016). Under that standard, and absent any special definitions, we give claim terms their ordinary and customary meaning, as they would be understood by one of ordinary skill in the art in the context of the entire patent disclosure. *In re Translogic Tech., Inc.*, 504 F.3d 1249, 1257 (Fed. Cir. 2007).

Only those terms in controversy need to be construed, and then only to the extent necessary to resolve the controversy. *Nidec Motor Corp. v. Zhongshan Broad Ocean Motor Co.*, 868 F.3d 1013, 1017 (Fed. Cir. 2017) (citing *Vivid Techs., Inc. v. Am. Sci. & Eng’g, Inc.*, 200 F.3d 795, 803 (Fed. Cir. 1999)).

2. Petitioner’s Position

Petitioner notes that, in the Litigation, the court construed the term “variable length code table” to mean “a table for transforming each variable length code into a value that denotes the number of non-zero coefficients in a block, within a given table each variable length code is unique and maps to one unique value.” Pet. 16 (citing Ex. 1010, 17–19). According to Petitioner, under the broadest reasonable interpretation standard, this term should be construed as “a table that corresponds the number of non-zero coefficients in a block with a variable length code.” *Id.* (citing Ex. 1008, Section VIII.E.1).

Petitioner also notes that, in the Litigation, the court construed the phrase “generated by coding the number of non-zero coefficients included in the current block” to mean “generated by transforming the number of non-zero coefficients included in the current block into a variable length code.” *Id.* at 17 (citing Ex. 1010, 19–23). Petitioner states that, for purposes of this proceeding, Petitioner adopts the court’s construction of this phrase. *Id.*

Petitioner further states that, as in the Litigation, the “unit” terms of claim 1 should not be construed as means-plus-function limitations under 35 U.S.C. § 112, paragraph 6, but should be given their ordinary and customary meaning. *Id.* at 17–18.

3. Patent Owner’s Position

Regarding the term “variable length code table,” Patent Owner does not agree with Petitioner’s “broader definition.” Prelim. Resp. 23. However, Patent Owner states it will not fully brief this issue because Petitioner’s proposed construction does not impact the issues briefed in this proceeding, but Patent Owner reserves the right to brief the issue if *inter partes* review is instituted. *Id.*

Regarding the “generated” phrase, Patent Owner does not dispute the court’s construction in the Litigation for purposes of the Preliminary Response. *Id.* at 24.

Regarding the “unit” terms, Patent Owner agrees with Petitioner that they should not be construed as means-plus-function limitations, but should be given their ordinary and customary meaning to a person of ordinary skill in the art. *Id.* at 24.

4. *Analysis*

To the extent construction is necessary for purposes of deciding this Petition, we adopt the district court’s constructions in the Litigation for the term “variable length code table” and the phrase “generated by coding the number of non-zero coefficients included in the current block.” See Ex. 1010, 19, 23. Consistent with the parties’ positions, and for purposes of this Decision, we also conclude that the “unit” terms of claim 1 should not be construed as means-plus-function limitations, but should be given their ordinary and customary meaning to a person of ordinary skill. We determine there is no reason to construe any other terms or phrases beyond adopting, for purposes of this Decision, the district court’s constructions.

B. *Asserted Obviousness of Claim 1 Over the Combination of H.324, H.263, and JVT-B045*

Petitioner contends that the H.324 and H.263 standards collectively describe the basic elements of a multimedia coding system, including a demultiplexer, an audio codec, and a video codec that implements block-based coding, prediction, transformation, quantization, and variable length coding, and disclose limitations [1a], [1b], [1c], [1d], [1f], [1g], and [1h] of claim 1. Pet. 19, 49–55, 57, 58. Petitioner contends that JVT-B045 “suggests” limitations [1e], [1i], [1j], and [1k] of claim 1. *Id.* at 55–62. Petitioner also contends that a person of ordinary skill would have been motivated to combine H.324 with H.263 and to modify H.263 to incorporate JVT-B045. *Id.* at 62–66.

Patent Owner does not dispute Petitioner’s contentions regarding the limitations of claim 1, except for limitation [1i]. In that regard, Patent Owner contends that JVT-B045 does not disclose or suggest “a determining

unit configured to determine a *predictive value* for the number of non-zero coefficients included in the current block based on the number of non-zero coefficients included in a decoded block *located on a periphery of the current block*,” as recited in limitation [1i]. Prelim. Resp. 28.

On this record, and for the reasons discussed below, we determine that Petitioner has not demonstrated a reasonable likelihood of prevailing on this challenge.

1. *Applicable Law*

A claim is unpatentable under 35 U.S.C. § 103(a) if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. *KSR Int’l Co. v. Teleflex Inc.*, 550 U.S. 398, 406 (2007). The question of obviousness is resolved on the basis of underlying factual determinations, including: (1) the scope and content of the prior art; (2) any differences between the claimed subject matter and the prior art; (3) the level of skill in the art; and (4) when in evidence, objective evidence of nonobviousness, i.e., secondary considerations. *See Graham v. John Deere Co.*, 383 U.S. 1, 17–18 (1966).

“In an [*inter partes* review], the petitioner has the burden from the onset to show with particularity why the patent it challenges is unpatentable.” *Harmonic Inc. v. Avid Tech., Inc.*, 815 F.3d 1356, 1363 (Fed. Cir. 2016). The burden of persuasion never shifts to Patent Owner. *Dynamic Drinkware, LLC v. Nat’l Graphics, Inc.*, 800 F.3d 1375, 1378 (Fed. Cir. 2015).

We analyze the challenges presented in the Petition in accordance with the above-stated principles.

2. *Level of Ordinary Skill in the Art*

Petitioner asserts that a person of ordinary skill in the art at the time of the alleged invention of the '238 patent would have had at least an undergraduate degree in Electrical Engineering, Computer Science, Computer Engineering, or a related field, and approximately two years of experience in design, development, and/or testing relevant to multimedia processing, such as audio, video, and/or image processing or coding. Pet. 7. Petitioner also asserts that a person of ordinary skill would have been familiar with the multimedia and/or video coding techniques described in the industry standards discussed in Section VIII of the Petition. *Id.* Currently, Patent Owner has not expressed a position on the level of ordinary skill in the art. Based on the current record, the subject matter at issue, and the prior art of record, we determine that for purposes of this Decision, Petitioner's proposed level of ordinary skill in the art is reasonable. Thus, we adopt and apply Petitioner's proposed level of ordinary skill in the art.

3. *Prior Art*

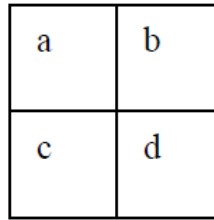
Based on Patent Owner's contentions regarding this challenge, we focus on the prior art reference identified by Petitioner as JVT-B045. *See* Ex. 1005. Petitioner asserts that in December 2001, the ITU-T's Video Coding Expert Group ("VCEG") and the ISO/IEC's Moving Picture Experts Group ("MPEG") formed a Joint Video Team ("JVT") to finalize the H.26L working draft and submit it for adoption as the H.264/AVC standard. Pet. 27 (citing Ex. 1008 ¶¶ 36–38). Petitioner also asserts that during

meetings of the JVT in late 2001 and early 2002, members published proposals concerning improved entropy coding¹ techniques and that “[t]hese proposals disclose the same technique that was later claimed in the ’238 patent.” *Id.* at 28. According to Petitioner, JVT-B045, entitled “Improved low complexity entropy coding for transform coefficients,” is a JVT proposal authored by Gisle Bjontegaard² that was discussed at the JVT’s second meeting in Geneva from January 29 to February 1, 2002. *Id.* at 30 (citing Ex. 1005, 1; Ex. 1008 ¶¶ 136–156). Petitioner asserts that in JVT-B045, Dr. Bjontegaard proposed to replace the existing low complexity entropy coding method (UVLC) with a more efficient context-adaptive VLC coding method that encoded the number of non-zero coefficients in the current block. *Id.* at 31 (citing Ex. 1005, 1; Ex. 1008 ¶ 138).

JVT-B045 states that “[t]he method is used for luma [image brightness] coefficients only” and “[t]he rest of the parameters are still UVLC coded.” Ex. 1005, 1; *see also*, Prelim. Resp. 18. JVT-B045 describes an overview of the method in regard to the coding of coefficients in an 8×8 block, that is subdivided into 4×4 blocks labeled a, b, c, and d, as depicted in the figure below:

¹ Petitioner asserts that “entropy coding” is a compression technique that represents frequently occurring patterns with fewer number of bits and rarely occurring patterns with a larger number of bits. Pet. 27 (citing Ex. 1008 ¶ 83).

² The author or contact information on JVT-B045 refers to Gisle Bjontegaard of Telenor Plus in Oslo, Norway. Ex. 1005, 1; *see also* Ex. 1008 ¶ 136.



The above figure, from JVT-B045, is a square that is sub-divided into four smaller squares labeled a, b, c, and d, with squares a and b in a row on top of squares c and d. In the proposed method, a single bit for each of blocks a, b, c, and d indicates “if there are coefficients or not.” Ex. 1005 at 2. JVT-B045 explains that the proposed method uses a single scan and three elements to code the 8×8 block: (1) code one bit for each of a, b, c, d to indicate if there are coefficients or not; (2) if there are coefficients (signaled by the 1 bit above), code the number of non-zero coefficients; and (3) code the combinations of (RUN, LEVEL) for each coefficient. Ex. 1005, 2. JVT-B045 also states that different code tables of 16 code words are used depending on how many of the 4×4 blocks a, b, c, d have non-zero coefficients (M) and the number of non-zero coefficients present in the last coded 4×4 block (N). *Id.* JVT-B045 proposed four different VLC tables (VLC1–VLC 4), as indicated below (*id.*):

Number of coefficients in a 4x4 block:	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
Bits to signal NumCof with VLC 1:	6	1	2	3	4	5	7	8	9	10	11	12	13	14	15	15
Bits to signal NumCof with VLC 2:	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	15
Bits to signal NumCof with VLC 3:	2	2	3	3	4	4	5	5	6	6	7	7	8	8	8	8
Bits to signal NumCof with VLC 4:	4	3	3	3	3	4	4	4	4	5	5	5	5	5	6	6

The top row of the above figure is labeled “Number of coefficients in a 4×4 block:” followed by numbers 1 through 16 in sequence. The next four rows in the figure are each labeled “Bits to signal NumCof” for VLC 1 through VLC 4, respectively, followed by the bit assignments listed under each of numbers 1–16 in the top row. The bit assignments indicate the number of bits allocated to represent the corresponding VLC code for each of the number of coefficients 1–16.³ See Ex. 1008 ¶ 144. JVT-B045 proposes the following specific rules for assignment of a VLC table based on the values of M (the number of 4×4 blocks a, b, c, and d that have non-zero coefficients) and N (the number of non-zero coefficients present in the last coded 4×4 block):

- VLC 1: $M = 1$ (in intra MBs VLC 2 is used instead)
- VLC 2: $M = 2$ or $M > 2$ and $N < 3$
- VLC 3: $M > 2$ and ($N = 3$ or $N = 4$)
- VLC 4: $M > 2$ and $N > 4$

4. Analysis

Petitioner contends that JVT-B045 suggests limitation [1i], which recites, in relevant part, “a determining unit configured to determine a predictive value for the number of non-zero coefficients included in the current block based on the number of non-zero coefficients included in a decoded block located on a periphery of the current block.” Pet. 58–59. In

³ For example, JVT-B045 states that VLC 1 “uses 6 bits to signal 1 coefficient.” Ex. 1005, 2. JVT-B045 explains that the reason for this long code word is that “[e]limination of single coefficients in inter macroblocks’ is applied . . . [and] [a]s a result, 1 coefficient in an 8x8 block is a rare event.” *Id.*

particular, Petitioner contends JVT-B045 suggests a “determining unit” that is configured to predict the number of non-zero coefficients in the current block by determining the number of non-zero coefficients in the last coded 4×4 block (N), which is then used to select a VLC table for decoding the number of non-zero coefficients in the current block. *Id.* at 59 (citing Ex. 1005, 2; Ex. 1008 ¶¶ 295–296). Petitioner further contends that a person of ordinary skill would understand that the last coded 4×4 block is located on the periphery and may exist within an 8×8 block or within a neighboring block. *Id.* (citing Ex. 1008 ¶¶ 146–150, 296–299).

Patent Owner contends that JVT-B045 discloses a fundamentally different algorithm than the ’238 patent for selecting a variable length code table because claim 1 requires determining a “predictive value” for the number of non-zero coefficients in the current block based on “the number of non-zero coefficients in a decoded block *located on a periphery* of the current block,” whereas JVT-B045 “discloses an algorithm that determines a parameter ‘N,’ which is ‘how many [non-zero] coefficients *the last coded 4x4 block* had (N).’” Prelim. Resp. 2. According to Patent Owner, “[l]ogic that utilizes the number of coefficients found in a block ‘located on a periphery’ (a spatial relationship) is not the same as logic that utilizes the number of coefficients from the ‘last coded block’ (a temporal relationship).” *Id.* Patent Owner also contends JVT-B045 does not disclose an apparatus that includes a “determining unit” as recited in limitation [1i] “configured to determine a predictive value based on the number of non-zero coefficients included in a decoded block *located on a periphery* of the current block.” *Id.* at 28–31. Patent Owner further contends that

Dr. Schonfeld's assertion that a person of ordinary skill in the art would understand that the last coded 4×4 block is located on a periphery of the current block is inaccurate and easily disproved. *Id.* at 31–38.

We are persuaded by Patent Owner's contentions.⁴ First, we agree with Patent Owner that, in asserting JVT-B045 "suggests" limitation [1i], Petitioner did not cite to any part of JVT-B045 that discloses an apparatus including a "determining unit configured to determine a predictive value . . . of non-zero coefficients in the current block based on the . . . non-zero coefficients included in a decoded block located on a periphery of the current block." Prelim. Resp. 31. Second, we agree with Patent Owner that the algorithm disclosed by JVT-B045 does not "suggest" a determining unit configured as recited in limitation [1i] because the limitation recites determining a predictive value based on a "spatial relationship"—the current block "located on a periphery of the current block"—whereas JVT-B045 determines the number of non-zero coefficients in the "*last* coded block," which is a temporal relationship. *Id.*; see also *id.* at 32. We also note, as does Patent Owner, that the algorithm disclosed in JVT-B045 determines a parameter "N"—the number of non-zero coefficients in the last coded 4×4 block—but this parameter plays no role in the selection of a VLC table when M=1. *Id.* at 19. Based on the rules for assignment of VLC tables in JVT-B045, as Patent Owner argues, "VLC1 is always selected when M=1." *Id.*; see also Ex. 1005, 2.

⁴ Patent Owner makes other contentions regarding why JVT-B045 does not teach or suggest limitation [1i], but we do not address them because we find the addressed contentions to be dispositive on this challenge to claim 1.

Third, we are **not persuaded** by Dr. Schonfeld's testimony that a person of ordinary skill "would understand that **'the last coded 4x4 block' mentioned in the B-045 proposal is a neighboring block that is located on the periphery of the block being currently coded.**" See Ex. 1008 ¶¶ 146, 150. Patent Owner argues, and we agree, Dr. Schonfeld acknowledges that a previously decoded block is "located on a periphery of the current block" if the two blocks "share an edge or a vertex." Prelim. Resp. 29–31 (citing Ex. 1008 ¶¶ 242, 248, 299). Dr. Schonfeld's conclusion that a person of ordinary skill would understand the last coded block of JVT-B045 is located on a periphery of the block being currently coded is based on his analysis of the encoding of a picture from the H.263 Standard in which two rows of an image have been divided into four macroblocks of 16×16 pixels, each of which has been subdivided into four blocks of 8×8 pixels and further subdivided into four sub-blocks (a, b, c, d) of 4×4 pixels each. Ex. 1008 ¶¶ 146–150. However, in analyzing the illustration on which Dr. Schonfeld's testimony is based, Patent Owner identifies three examples in which the "last coded block" does not share an edge or a vertex with the current block. Prelim. Resp. 33–34. **Patent Owner also provides three additional examples based on analyzing JVT-B045 in light of H.263 demonstrating that JVT-B045's "last coded block will oftentimes not be located on a periphery of the current block."** Prelim. Resp. 34–36.

We find that Patent Owner's analysis of these six examples persuasively rebuts Dr. Schonfeld's assertion that "one of skill in the art would understand that B045's 'last coded 4x4 block' is a 'neighboring block that is located on the periphery of the block currently being coded.'" *Id.* at

37. In addition, we agree with Patent Owner that it is irrelevant for the “last coded block” to be sometimes “located on a periphery of the current block” because claim 1 is an apparatus claim, which includes a “decoding unit” that is “configured” to predict a value based on information from a decoded block “located on a periphery of the current block.” *Id.* In other words, as Patent Owner argues, if one programmed an apparatus to perform the algorithm disclosed by JVT-B045, “it would be **configured** to seek information from the ‘last coded block’” (a temporal relationship), which is different from the claimed apparatus configured to provide information based on a spatial relationship—a decoded block “located on a periphery of the current block.” *Id.*

Accordingly, for these reasons, we determine that Petitioner has failed to demonstrate a reasonable likelihood of prevailing on its assertion that claim 1 is obvious over the combination of H.324, H.263, and JVT-B045.

C. Asserted Obviousness of Claim 1 Over the Combination of H.324, H.263, and Bjontegaard

Petitioner contends that the H.324 and H.263 standards disclose limitations [1a], [1b], [1c], [1d], [1f], [1g], and [1h] of claim 1. Pet. 66–67, 70. Petitioner contends that Bjontegaard discloses limitations [1e], [1i], [1j], and [1k] of claim 1. *Id.* at 70–76. Petitioner also contends that a person of ordinary skill would have been motivated to combine Bjontegaard’s coefficient number decoder with the known coding methods and structures described in H.324 with H.263. *Id.* at 76–77. Patent Owner does not dispute Petitioner’s contentions regarding the limitations of claim 1, except for

limitations [1i] and [1j], which Patent Owner contends are not supported by the Bjontegaard provisional.⁵ Prelim. Resp. 41.

1. *Petitioner's Contentions*

Regarding limitation [1i], Petitioner contends that the Abstract, Figure 2, and column 9:40–44 and 46–48 of Bjontegaard disclose this limitation. Pet. 71–72. In particular, Petitioner asserts Bjontegaard discloses that “adaptive encoding of the number and trailing one coefficients may be performed in view of one or more neighboring sample blocks.” *Id.* at 70 (citing Ex. 1006, Abstract). Petitioner also asserts that Bjontegaard describes an embodiment that includes a calculation of a “context matrix” that is “based on number of coefficients in neighboring Block(s).” *Id.* (citing Ex. 1006, Fig. 2). In this embodiment, Petitioner asserts “coding logic 124 of Num-Trail encoder block 102 computes an average number of transform coefficients in one or more selected neighboring sample blocks as the context metric (Avg.).” *Id.* at 71 (citing Ex. 1006, 9:40–41). Petitioner also asserts that, for example, “where a zig-zag scan is used,” “coding logic 124 calculates Avg of the sample block above and the sample block to the left of the current sample block as the context metric.” *Id.* (citing Ex. 1006, 9:46–48; Ex. 1008 ¶ 334). Petitioner also argues that Bjontegaard discloses that the decoder is “similarly constituted” as the encoder, and a person or ordinary skill would understand “that to decode the number of non-zero

⁵ Because we determine that Patent Owner’s contentions regarding limitation [1i] are dispositive of this challenge to claim 1, we do not address Patent Owner’s argument that limitation [1j] is not supported by the Bjontegaard provisional (see Prelim. Resp. 43–44).

coefficients in the current block, the decoder must necessarily reverse the steps performed by the encoder.” *Id.* at 71–72 (citing Ex. 1006, 17:19–28; Ex. 1008 ¶ 335). Thus, Petitioner argues Bjontegaard discloses limitation [1i] because it discloses a “determining unit” configured to calculate the “context metric” (Avg.) number of non-zero coefficients in neighboring blocks on the periphery of the current block and the “context metric” is a “predictive value” used to “predict” the number of non-zero coefficients in the current block based on the number of non-zero coefficients in decoded blocks on the periphery of the current block. *Id.* at 72 (citing Ex. 1008 ¶ 336).

With respect to the provisional application, Petitioner asserts it discloses “another method of predicting the number of non-zero coefficients in the current block and selecting a VLC table, which also meets limitation [1i].” *Id.* at 70–71 (citing Ex. 1007, 2; Ex. 1008 ¶ 333). In that regard, Petitioner cites the portion of the provisional stating: “[t]he assignment of VLC table depends on: How many of the 4x4 blocks have coefficients (M), and how many coefficients the previously coded 4x4 block had (N).” *Id.* (citing Ex. 1007, 2).

2. *Patent Owner’s Contentions*

Patent Owner contends that the ’238 patent is entitled to a priority date of April 15, 2002, based on the filing date of Japanese Patent Application No. 2002–112665. Prelim. Resp. 13 (citing Exs. 1002, 2001, 2002, 2003, 35 U.S.C. § 119(a)–(d); 40). Patent Owner asserts that Petitioner does not challenge the April 15, 2002, priority date, and neither does Petitioner’s expert. *Id.* (citing Ex. 1008 ¶ 231, stating that “[f]or the

purposes of my analysis, I assume the priority date of the purported invention to be April 15, 2002.”). Patent Owner also contends that the Bjontegaard patent is not effective as a § 102 reference with respect to the portions cited by Petitioner regarding limitation [1i] because “[n]one of these portions are supported by the provisional.” *Id.* at 40–41.

First, Patent Owner argues that Dr. Schonfeld’s declaration does not make the requisite showing regarding the disclosure of the provisional. *Id.* at 41. Patent Owner argues that Dr. Schonfeld simply writes that a person of ordinary skill in the art would understand that the last coded block is located on the periphery of the block being encoded for the reasons discussed with respect to JVT-B045; however, Patent Owner asserts “as discussed above, [JVT-]B045 does not show that a POSITA would draw such a conclusion.” *Id.* at 41–42. In regard to the Bjontegaard patent, Patent Owner argues the four portions cited by Dr. Schonfeld—(1) the Abstract; (2) Figure 2; (3) 9:41–45; and (4) 9:47–49—are not supported by the provisional. *Id.* at 42. In particular, Patent Owner asserts that “the phrases ‘neighboring block’ and ‘sample block above and sample block to the left’ do not even appear in the *Bjontegaard* provisional.” *Id.* Patent Owner also asserts that “Dr. Schonfeld admits ‘the provisional application for [*Bjontegaard*] discloses **another embodiment**,’ based on a “previously coded block,” which Patent Owner argues “as with [JVT-]B045,” is “not a block “located on a periphery.” *Id.* at 42–43 (citing Ex. 1008 ¶ 333). Patent Owner further asserts that the Bjontegaard provisional does not disclose using a computed “Avg” from “neighboring blocks” to select a VLC table, as shown and described in Figure 2, as well as 9:58–10:3, of the Bjontegarrd patent, as

cited by Dr. Schonfeld. *Id.* at 43–44 (citing Ex. 1008 ¶ 339). Instead, Patent Owner argues the Bjontegaard provisional discloses the same deficient method of JVT-B045. *Id.* at 44.

Second, Patent Owner contends the Petition fails to make the requisite showing regarding limitation [1i] because it cites to the same portions of Bjontegaard upon which Dr. Schonfeld relies—the Abstract, Figure 2, and the same portions of column 9—but fails to demonstrate that the provisional contains this subject matter. *Id.* at 44–45. According to Patent Owner, instead of showing support in the provisional, Petitioner concedes, like Dr. Schonfeld, that “[t]he provisional application discloses another method of predicting the number of non-zero coefficients in the current block and selecting a VLC table.” *Id.* at 45 (citing Pet. 70). Patent Owner asserts that this other method in the provisional does not support the “neighboring blocks” disclosure of Bjontegaard, but discloses the “last coded block” method of JVT-B045. *Id.*

Third, Patent Owner contends that *Dynamic Drinkware LLC v. Nat’l Graphics, Inc.*, 800 F.3d 1375, 1378 (Fed. Cir. 2015), requires Petitioner to show more than support for a claim. *Id.* at 45–46. In particular, Patent Owner argues that *Dynamic Drinkware* requires Petitioner to make two showings: (1) at least one claim of the patent is supported by the provisional and (2) the portions relied upon to anticipate or render obvious the patent-at-issue are included in the priority application. *Id.* at 46 (citing *Dynamic Drinkware*, 800 F.3d at 1378–79; *Ex parte Mann*, Appeal No. 2015-3571, 2016 WL 7487271 (PTAB Dec. 21, 2016)). Patent Owner asserts that Petitioner acknowledged this two-part standard in *Huawei Device Co., Ltd.*

v. Optis Cellular Tech., LLC, Case No. IPR2018-00807, Paper 3 at 19 (PTAB Mar. 21, 2018). *Id.* at 46. Patent Owner argues that, although the Petition does not include explicit analysis of why the relied upon portions of the Bjontegaard patent are supported by its provisional, Dr. Schonfeld writes in his declaration that several portions of the provisional provide written description support for claim 1 of Bjontegaard. *Id.* at 45. Patent Owner further argues that “[w]hile this analysis—if correct—may satisfy one requirement of *Dynamic Drinkware*, it does not alone qualify the Bjontegaard patent as prior art, because it does not provide evidence that the Bjontegaard provisional contains the subject matter that Petitioner relies on for Ground II.” *Id.* at 45–46. According to Patent Owner, “[s]imply showing support for a single claim is insufficient.” *Id.* at 46.

Fourth, Patent Owner contends Petitioner improperly incorporates by reference the analysis in its expert’s declaration that the Bjontegaard patent should be entitled to the priority date of its provisional. *Id.* at 46–47 (citing Pet. 37 (citing Ex. 1008, Section VII.G.3)). Patent Owner asserts that “[t]he Board prohibits incorporation by reference.” *Id.* at 47 (citing *Cisco Sys., Inc. v. C-Cation Techs., LLC*, Case No. IPR2014-00454, Paper 12 at 9–10 (PTAB Aug. 29, 2014) (informative opinion) (citing 37 C.F.R. § 42.6(a)(3))).

3. Analysis

As Patent Owner argues, Petitioner **does not contest the April 15, 2002, priority date of the ’238 patent**. See Ex. 1008 ¶ 231 (stating that “[f]or the purposes of my analysis, I assume the priority date of the purported invention to be April 15, 2002.”). In this challenge to claim 1, Petitioner relies on the Bjontegaard ’387 patent as prior art under 35 U.S.C. § 102(e) as

of the filing date of the provisional application from which it claims priority. Pet. 6. The Bjontegaard patent issued from an application filed on August 30, 2002, and claims priority to the provisional application filed on March 22, 2002. See Pet. 36 (citing Ex. 1006, 1:8–12; Ex. 1007). In *Dynamic Drinkware*, the Federal Circuit held that in an *inter partes* review, once a patent owner has responded to a petitioner's argument with sufficient evidence that its patent is entitled to a priority date before a prior art reference, the burden of production shifts back to the petitioner to prove that the prior art reference is entitled to the benefit of the filing date of a provisional application. 800 F.3d at 1380. Thus, because the priority date of the '238 patent is April 15, 2002, before the filing date of the Bjontegaard patent on August 30, 2002, Petitioner has the burden of production to prove that the Bjontegaard patent is entitled to the benefit of the earlier March 22, 2002, filing date of its provisional application.

Before analyzing the issue of whether Petitioner has met its burden of production, we must analyze the issue of what is the standard of proof for Petitioner to meet its burden of production. In that regard, Patent Owner contends *Dynamic Drinkware* requires Petitioner to make two showings: (1) at least one claim of the patent is supported by the provisional; and (2) the portions relied upon to anticipate or render obvious the patent-at-issue are included in the priority application. Prelim. Resp. 46 (citing *Dynamic Drinkware*, 800 F.3d at 1378–79). In support of this contention, Patent Owner also cites *Ex parte Mann*, Appeal No. 2015-3571, 2016 WL 7487271 (PTAB Dec. 21, 2016), and asserts that Petitioner acknowledged this two-part standard in *Huawei Device Co., Ltd. v. Optis Cellular Tech.*,

LLC, Case No. IPR2018-00807, Paper 3 at 19 (PTAB Mar. 21, 2018). *Id.* We agree with Patent Owner that in IPR2018-00807, Petitioner asserted, in interpreting *Dynamic Drinkware*, the Board has held that a § 102(e) reference is available as prior art as of its provisional application's filing date when the provisional provides support for (1) at least one claim of the reference and (2) the subject matter on which the petitioner relies. *Huawei Device Co., Ltd. v. Optis Cellular Tech., LLC*, Case No. IPR2018-00807, Paper 3 at 19 (PTAB Mar. 21, 2018) (citing *Cisco Sys., Inc. v. Capella Photonics, Inc.*, IPR2014-01276, Paper No. 40 at 21–22 (PTAB Feb. 17, 2016)).

We agree with Patent Owner that Petitioner is required to meet this two-part standard. Regarding part one—whether the disclosure of the provisional provides support for at least one of the claims in the reference patent—the Federal Circuit held in *Dynamic Drinkware* that “[a] reference patent is only entitled to claim the benefit of the filing date of its provisional application if the disclosure of the provisional application provides support for the claims in the reference patent in compliance with § 112, ¶ 1.” 800 F.3d at 1381. Although this holding refers to the plural “support for the claims,” we determine that, based on the rationale set forth in *Mann*, “under *Dynamic Drinkware*, a non-provisional child can be entitled to the benefit of a provisional application's filing date if the provisional application provides sufficient support for at least one claim in the child.” *Mann*, 2016 WL 7487271 at *6.

Regarding part two—whether the disclosure of the provisional provides support for the subject matter relied on to show anticipation or

obviousness (“the subject matter test”)—we determine it is supported by Federal Circuit precedent that focuses on whether a reference “‘discloses’ (not claims) subject matter that was carried forward from an earlier U.S. provisional application.” *Mann*, 2016 WL 7487271 at *5 (citing *In re Giacomini*, 612 F.3d 1380, 1383 (Fed. Cir. 2010) (“Therefore, an applicant is not entitled to a patent if another’s patent discloses the same invention, which was carried forward from an earlier U.S. provisional application or U.S. non-provisional application.”); *Ex parte Yamaguchi*, 88 USPQ.2d 1606, 1613 (BPAI 2008) (finding “the facts relied upon by the Examiner in the rejection” adequately supported in the provisional)). As discussed in *Mann*, the subject matter test “is similarly supported by statute, in which ‘an invention disclosed’ (as opposed to an invention claimed) is entitled to the priority date ‘as to such invention.’” 35 U.S.C. § 119(e)(1) (“An application for patent . . . *for an invention disclosed* in the manner provided by the first paragraph of section 112 of this title in a provisional application . . . shall have the same effect, *as to such invention*, as though filed on the date of the provisional application.”) (emphasis added). *Mann*, 2016 WL 7487271 at *5.

Having decided the standard for Petitioner to claim priority from the filing date of the Bjontegaard provisional, we now turn to the issue of whether Petitioner has met its burden of production to show that the Bjontegaard provisional provides support (1) for at least one claim of the Bjontegaard patent and (2) the subject matter Petitioner asserts teaches or suggests limitation [1i]. First, in regard to whether the Bjontegaard provisional provides support for at least one claim of the Bjontegaard patent,

we agree with Patent Owner's contention that Petitioner improperly incorporated by reference the analysis in its expert's declaration. Prelim. Resp. 46–47. In his declaration, Dr. Schonfeld states that the Bjontegaard provisional “contains a written description of the claimed invention and the manner and process of making and using it,” and then compares the disclosure of the provisional with the limitations of claim 1 of the '387 patent. Ex. 1008 ¶¶ 224–230. These paragraphs constitute all of Section VII.G.3 of Dr. Shonfeld's declaration. The Petition states that, as discussed in Dr. Schonfeld's declaration, “the provisional application contains a written description of the claimed invention and the manner and process of making and using it” and cites to Section VII.G.3 of the declaration. Pet 37 (citing Ex. 1008, Section VII.G.3). Although Petitioner discusses the disclosure of the provisional application (*see id.* at 38–39), nowhere in the Petition is there a specific comparison of the disclosure of the Bjontegaard provisional with claim 1 or any other claim of the '387 patent. Thus, we agree with Patent Owner that Petitioner violated 37 C.F.R. § 42.6(a)(3)) by incorporating by reference Dr. Schonfeld's comparison of the teachings of the Bjontegaard disclosure with claim 1 of the Bjontegaard patent.

Accordingly, the improperly incorporated material has not been considered.

In regard to whether the Bjontegaard provisional provides support for the subject matter Petitioner asserts teaches or suggests limitation [1i], Petitioner contends that both the Bjontegaard patent and the Bjontegaard provisional disclose this subject matter. Pet. 70–72. With respect to the Bjontegaard patent, Petitioner contends that the Abstract, Figure 2, and column 9:40–44 and 46–48 disclose this limitation. *Id.* In particular,

Petitioner asserts “Bjontegaard describes an embodiment that includes a calculation of a ‘context matrix’ that is ‘based on number of coefficients in neighboring Block(s).” *Id.* at 70 (citing Ex. 1006, Abstract, Fig. 2). With respect to the Bjontegaard provisional, Petitioner asserts that it “discloses another method of predicting the number of non-zero coefficients in the current block and selecting a VLC table, which also meets limitation [1i]. *Id.* at 70–71 (citing Ex. 1007, 2 (“The assignment of VLC table depends on: How many of the 4x4 blocks have coefficients (M), and how many coefficients the previously coded 4x4 block had (N).”); Ex. 1008 ¶ 333).

Even if we were to conclude that, based on the these contentions and evidence, Petitioner met its burden of production to show that the Bjontegaard provisional provides support (1) for at least one claim of the Bjontegaard patent and (2) the subject matter Petitioner asserts teaches or suggests limitation [1i], we determine that Petitioner has failed to meet its burden of persuasion to show that the subject matter disclosed by the Bjontegaard provisional teaches or suggests limitation [1i]. First, as Patent Owner argues, Petitioner has not demonstrated that the four cited portions of the Bjontegaard patent—the Abstract, Figure 2, 9:41–45, and 9:47–49—relied on to teach limitation [1i] are supported by the provisional. Prelim. Resp. 40–41, 42, 44–45. In that regard, we agree with Patent Owner that “the phrases ‘neighboring block’ and ‘sample block above and sample block to the left’ do not even appear in the *Bjontegaard* provisional.” *Id.* at 42. Second, we agree with Patent Owner that, rather than showing support in the provisional for the disclosures in the ’387 patent, Petitioner concedes, like Dr. Schonfeld, “[t]he provisional application discloses another method of

predicting the number of non-zero coefficients in the current block and selecting a VLC table.”’ *Id.* at 45 (citing Pet. 70); *see also* Ex. 1008 ¶ 333 (emphasis added).

Third, consistent with Patent Owner’s argument that the Bjontegaard provisional “discloses the same deficient methods of [JVT-]B045” (*id.* at 44), we determine that the coding method of the provisional is substantially the same as the method of JVT-B045 and fails to teach or suggest limitation [1i] for the same reasons discussed above regarding JVT-B045. The provisional discloses that “[t]he assignment of VLC tables depends on: How many of the 4x4 blocks have coefficients (M), and how many coefficients the previously coded 4x4 block had (N).” Ex. 1007 at 2. Patent Owner notes that this process is based on “the previously coded 4x4 block,” which Patent Owner argues “is not a block ‘located on a periphery’” and, therefore, “the number of coefficients it contains is not predictive.” Prelim. Resp. 43. In his testimony that the Bjontegaard provisional discloses another embodiment than the ’387 patent, Dr. Schonfeld cites to “Section VII.G above.” Ex. 1008 ¶ 333. In Section VII.G.1, Dr. Schonfeld discusses the Bjontegaard provisional. *Id.* at ¶¶ 210–217. Dr. Schonfeld states that the provisional application is “context-adaptive” because it includes the selection of a VLC table “based on the number of 4x4 blocks that have non-zero coefficients (M) and the number of non-zero coefficients present in the last coded 4x4 block (N). Ex. 1008 ¶ 214 (citing Ex. 1007, 2). Dr. Schonfeld also states that “[t]he [provisional] discloses the following rules to govern the selection of a VLC table”:

VLC0:	$M = 1$ (for intra MBs and chroma AC coefficients VLC1 is used instead)
VLC1:	$M = 2$ or $M > 2$ and $N < 3$
VLC2:	$M > 2$ and $N: 3,4,5$
VLC3:	$M > 2$ and $N > 5$

Id. These rules establish that the following VLC table is selected based on the values of M and N: VLC0 if M equals 1; VLC1 if M equals 2 or M is greater than 2 and N is less than 3; VLC2 if M is greater than 2 and N is equal to 3, 4, or 5; and VLC3 if M is greater than 2 and N is greater than 5. Dr. Schonfeld then states that “[a]s discussed in the section on the JVT-B045 proposal, a POSITA would understand that the last coded block is located on the periphery of the block being encoded.” *Id.* at ¶ 215.

We note that the above rules for selection of a VLC table in the provisional are substantially the same as those in JVT-B045. See Ex. 1005, 2. Thus, although the description of the coding process in the provisional application is not exactly the same as in JVT-B045, Dr. Schonfeld interprets the processes to be the same or substantially the same. We also interpret them to be substantially the same based on the calculation of the values of M and N to determine the VLC tables to use, as described by Dr. Schonfeld, and the use of similar rules for assignment of VLC tables in both the provisional and JVT-B045.

Accordingly, for the reasons discussed above regarding JVT-B045, we agree with Patent Owner that the Bjontegaard provisional does not disclose subject matter that teaches or suggests limitation [1i]. We determine, therefore, that Petitioner has failed to demonstrate a reasonable

likelihood of prevailing on its assertion that claim 1 of the '238 patent is obvious based on the combination of H.324, H.263, and Bjontegaard.

III. CONCLUSION

For the foregoing reasons, we determine Petitioner has not demonstrated a reasonable likelihood of success in proving that claim 1 of the '238 patent is unpatentable on the grounds asserted in the Petition.

IV. ORDER

Accordingly, it is

ORDERED that the Petition is denied, and no *inter partes* review is instituted.

IPR2018-00658
Patent 7,769,238 B2

PETITIONER:

Anupam Sharma
David Garr
COVINGTON & BURLING LLP
asharma@cov.com
dgarr@cov.com

PATENT OWNER:

Brent N. Bumgardner
Matthew C. Juren
NELSON BUMGARDNER ALBRITTON P.C.
brent@nbafirm.com
matthew@nbafirm.com
optis-IPR@nbafirm.com