

UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE PATENT TRIAL AND APPEAL BOARD

SAMSUNG ELECTRONICS CO., LTD.,
Petitioner,

v.

M & K HOLDINGS INC.,
Patent Owner.

Case IPR2018-00697
Patent 9,191,673 B2

Before KARL D. EASTHOM, MELISSA A. HAAPALA, and
SHARON FENICK, *Administrative Patent Judges*.

FENICK, *Administrative Patent Judge*.

DECISION

Final Written Decision

35 U.S.C. § 318(a) and 37 C.F.R. § 42.73

Decision on Motion to Amend

35 U.S.C. § 316(d) and 37 C.F.R. § 42.121

I. INTRODUCTION

Petitioner, Samsung Electronics Co., Ltd. (“Samsung”), filed a Petition for *inter partes* review of claims 1–7 (“the challenged claims”) of U.S. Patent No. 9,191,673 B2 (Ex. 1001, “’673 patent”). Paper 1 (“Pet.”). Patent Owner, M & K Holdings, Inc., filed a Preliminary Response. Paper 6 (“Prelim. Resp.”). The parties filed additional briefing to address an issue of collateral estoppel. Paper 8 (“Pet. Prelim. Reply”); Paper 9 (“PO Prelim. Sur-Reply”).

Applying the standard set forth in 35 U.S.C. § 314(a), which authorizes institution of an *inter partes* review 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,” we instituted an *inter partes* review of claims 1–7 of the ’673 patent on the grounds asserted in the Petition. Paper 10 (“Inst. Dec.”).

Following institution, Petitioner submitted a Motion to Submit Supplemental Information (Paper 16), which was opposed by Patent Owner (Paper 18). We granted this motion, and entered Exhibits 1068–1074 into the record. Paper 22.

Also following institution, Patent Owner submitted a Response (Paper 26, “PO Resp.”), Petitioner filed a Reply (Paper 31, “Reply”), and Patent Owner filed a Sur-Reply (Paper 37, “PO Sur-Reply”). Additionally, Patent Owner submitted a Contingent Motion to Amend (Paper 27, “Mot. Amend”) which was opposed by Petitioner (Paper 33, “Mot. Amend Opp.”)

An Oral Hearing on this and two related cases (IPR2018-00696 and IPR2018-00698) was held on June 11, 2019. The Hearing Transcript (“Tr.”) is included in the record as Paper 59. Subject to our direction at the Oral Hearing (Tr. 6:6–21) and a subsequent Order (Paper 50), Patent Owner and Petitioner each submitted a brief on claim construction (Paper 51, “PO Claim Const. Br.” and Paper 52, “Pet. Claim Const. Br.”) and a responsive brief on claim construction (respectively Paper 54, “PO Resp. Claim Const. Br.” and Paper 53, “Pet. Resp. Claim Const. Br.”). Additionally, Patent Owner and Petitioner each submitted a brief regarding *Samsung Elecs. Co., Ltd. v. Infobridge Pte. Ltd.*, 929 F.3d 1363 (Fed. Cir. 2019) (respectively Paper 55, “PO IB Br.” and Paper 56, “Pet. IB Br.”) and a responsive brief (respectively Paper 58, “PO Resp. IB Br.” and Paper 57, “Pet. Resp. IB Br.”). See Ex. 3003.

We have jurisdiction under 35 U.S.C. § 6(b)(4). This Final Written Decision issues under 35 U.S.C. § 318(a). Having considered the evidence of record, and for the reasons discussed below, Petitioner has demonstrated by a preponderance of the evidence that claims 1–7 of the ’673 patent are unpatentable under 35 U.S.C. § 103(a). In addition, for the reasons that follow, we grant the Motion to Amend. Finally, we order cancellation of claims 1–7 and replacement by new claims 8–14.

A. Related Matters

Petitioner filed several petitions challenging patents related to the ’673 patent. Pet. 1–2. Specifically, Petitioner filed petitions challenging claims in related patents in Cases IPR2017-00099 (final written decision issued), IPR2017-00100 (final written decision issued), IPR2017-00101

(institution denied), IPR2017-00102 (institution denied), IPR2018-00092 (final written decision issued), IPR2018-00093 final written decision issued), IPR2018-00094 (final written decision issued), IPR2018-00095 (*inter partes* review instituted), IPR2017-00101 (institution denied), IPR2017-00102 (institution denied), IPR2018-00011 (final written decision issued), IPR2018-00012 (final written decision issued), IPR2018-00696 (final written decision issued), and IPR2018-00698 (final written decision issued concurrently herewith). *See* Pet. 1–2; Paper 4, 1; Paper 43.

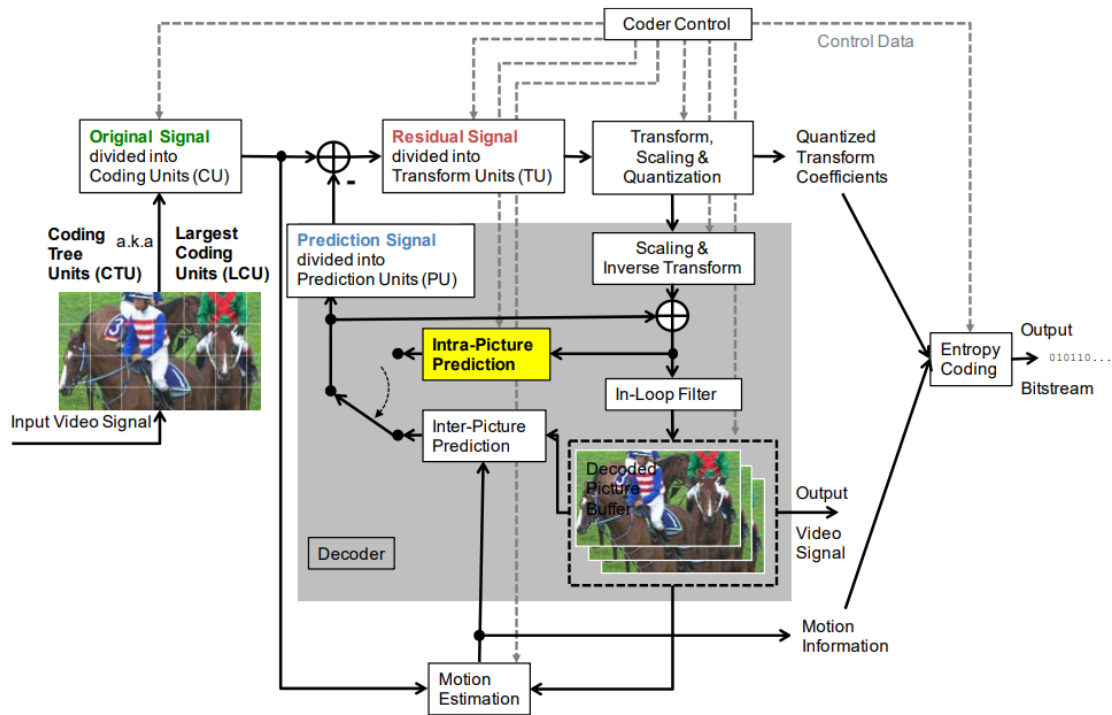
Additionally the United States Court of Appeals, Federal Circuit (the “Federal Circuit”), recently issued a decision in appeals of final written decisions in IPR2017-00099 (Ex. 2001) and IPR2017-00100 (Ex. 2002). *Infobridge*, 929 F.3d 1363 (vacating and remanding the final written decisions) (“Federal Circuit’s *Infobridge* decision”).

B. The ’673 Patent

The ’673 patent involves an image compression method. *See* Ex. 1001, 1:22–25. According to the ’673 patent, “moving picture compression technologies include H.261, Motion Picture Experts Group (MPEG)-2/H.262, H.263, MPEG-4, Advanced Video Coding (AVC)/H.264, and so on.” *Id.* at 1:25–28. More particularly, the ’673 patent relates to a video encoding method involving intra prediction processes. *See* Ex. 1001, Abstract, 1:15–18, 1:46–2:10; *see also id.* at 5:1–10:7, Fig. 3; *see* Ex. 1002 ¶¶ 23–32.

Demonstrative A, provided by Petitioner’s expert, Mr. Benjamin Bross, represents a flow diagram of the basic encoding process of coding employed in the H.264 standard described in the ’673 patent as noted above,

and also “the new H.265 | MPEG-H High-Efficiency Video Coding (HEVC) Standard.” See Ex. 1002 ¶¶ 12, 33 & 34 n.6. Demonstrative A, reproduced below, also represents background material for understanding the process of the ’673 patent (*see id.* ¶¶ 34 & n.6, 35–36):



DEMONSTRATIVE A

The encoding process as represented in Demonstrative A, depicted above, involves creating spatial subdivision regions from original picture frames (called largest coding units), dividing those into coding units (CUs), further dividing those CUs into prediction units of a current picture, creating related prediction units for storage and feedback as reference pictures, creating a residual signal of transform units as a difference of the two sets of prediction units, and then transforming, scaling and quantizing the transform

units. *See id.* ¶¶ 33–38 (citing Ex. 1005; Ex. 1010), ¶ 25 (analyzing Figure 3 of the '673 patent in similar fashion).¹

The encoding process of Demonstrative A includes process flow occurring in an area labeled “decoder.” The general flow process represented in Demonstrative A tracks the basic process involved in the decoder depicted in Figure 3 of the '673 patent in material respects, at least for purposes of understanding the disclosed invention.

As Demonstrative A indicates, the output of the described compression includes motion information and processed transform units (encoded, transformed, etc.) to form an output bitstream to be decoded at the decoder. *See id.* ¶¶ 35–38; Ex. 1001, Fig. 3 (transform quantization unit 120). At both the decoder and encoder, the process involves adding the prediction signal (or PUs) to decoded TUs to generate a reconstructed signal (which the encoder uses as a reference picture to create subsequent prediction units of subsequent pictures (i.e., inter-picture prediction)). *See* Ex. 1002 ¶ 38.

Mr. Bross also explains, in reference to Demonstrative A, that “[s]ubtracting the prediction signal from the original signal generates the **residual signal**. Accordingly, the residual signal corresponds to the prediction error, i.e., when the prediction is perfect, the residual signal

¹ The basic system described in reference to Demonstrative A tracks Figure 8 of Exhibit 1010 to some extent. *See* Ex. 1010, Fig. 8. As indicated, Demonstrative A provides background for what are overlapping features of basic concepts involved in HEVC, H.264, and other prior art encoding systems, and it overlaps with the basic block features of Figure 3 of the '896 patent. *See* Ex. 1002 ¶¶ 33–38.

would be equal to zero.” *Id.* ¶ 37 (citing Ex. 1010, 567, Fig. 8). At the decoder, “[t]he prediction signal is added again [to the decoded TUs of the residual signal] to generate the reconstructed signal, i.e., the original signal with a quantization error is obtained.” *Id.* ¶ 38 (citing Ex. 1010, 567, Fig. 8).

In the ’673 patent’s described intra prediction processes, intra predictor 140 determines the intra prediction mode and performs intra prediction to generate a prediction block using valid reference pixels. Ex. 1001, 6:18–23, 6:36–38, 7:1–4, 7:17–25. “Next, a residual block [is] obtained by using the current block and the prediction block generated by the intra predictor 140.” *Id.* at 7:31–32. The encoder transforms and quantizes the residual block to generate quantized transform coefficients. *Id.* at 5:27–36, 6:24–25, 7:31–34, Fig. 3. “The quantized transform coefficients are converted into one-dimensional (1D) quantized transform information by a predetermined scanning method and entropy-coded.” *Id.* at 6:27–29; Ex. 1002 ¶¶ 24–28. The ’673 patent further explains that the quantized block is inversely quantized and inversely transformed to generate a restored residual block in the spatial domain. Ex. 1001, 5:37–41; Ex. 1002 ¶ 26. The ’673 patent explains that “when the size of the transform block is equal to or larger than the predetermined size [(e.g., 8×8)], the quantized transform coefficients are divided into a main subset and one or more residual subsets, and quantized transform coefficients included in each subset are scanned and encoded.” Ex. 1001, 9:1–5. The scan pattern for scanning the quantized transform coefficients and the subsets “may be adaptively selected according to the prediction mode and the intra prediction direction.” *Id.* at 9:17–19; *see also id.* at 9:5–40; Ex. 1002 ¶¶ 29–31.

C. Illustrative Claim

Petitioner challenges all claims (i.e., claims 1–7) of the '673 patent.

Challenged claim 1, the sole independent claim, follows:

1. [a] An image encoding method, comprising:
 - [b] determining, by an intra predictor, an intra prediction mode for image or video data;
 - [c] generating, by the intra predictor, a prediction block according to the intra prediction mode;
 - [d] transforming and quantizing, by a transform/quantization unit, a residual block of the prediction block to generate a quantized block;
 - [e] inversely quantizing and inversely transforming, by an inverse quantization/transform unit, the quantized block to generate a restored residual block; and
 - [f] entropy-coding, by an entropy coder, quantized coefficients of the quantized block,
 - [g] wherein, when a size of the quantized block is equal to 8×8 , the quantized coefficients of the quantized block are divided into a plurality of subsets, and the quantized coefficients of each subset and the plurality of subsets are scanned according to a scan pattern determined by the intra prediction mode.

Ex. 1001, 13:1–20 (reference letters added to track Petitioner's nomenclature designating limitations a–g).

D. Asserted Grounds of Unpatentability

Petitioner asserts that the combination of Budagavi² and Sole³ renders obvious claims 1–3 of the '673 patent and the combination of Budagavi, Sole, and WD3-v1⁴ renders obvious claims 4–7 under 35 U.S.C. § 103(a). Pet. 3–4. Petitioner relies on Mr. Bross's Declaration (Ex. 1002), Dr. Vetro's Declaration (Ex. 1050), Mr. Bross's Supplemental Declaration (Ex. 1068), and Mr. Bross's Rebuttal Declaration (Ex. 1093). Patent Owner relies on Dr. Kalva's Declaration (Ex. 2025).

II. DISCUSSION

A. Principles of Law

It is a petitioner's burden to demonstrate unpatentability. *See Dynamic Drinkware, LLC v. Nat'l Graphics, Inc.*, 800 F.3d 1375, 1378 (Fed. Cir. 2015) (citing *Tech. Licensing Corp. v. Videotek, Inc.*, 545 F.3d 1316, 1326–27 (Fed. Cir. 2008)).

A patent claim is unpatentable under 35 U.S.C. § 103(a) if the differences between the claimed subject matter 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

² Budagavi et al., U.S. Pub. No. 2011/0170594 A1 (July 14, 2011, filed Dec. 30, 2010) (Ex. 1005).

³ Sole et al., *Unified Scans for the Significance Map and Coefficient level Coding in High Coding Efficiency*, JCTVC-E335 (version 3) (uploaded Mar. 19, 2011) (Ex. 1006).

⁴ Thomas Wiegand et al., *WD3: Working Draft 3 of High-Efficiency Video Coding*, JCTVC-E603 (version 1) (uploaded March 30, 2011) (Ex. 1007).

subject matter pertains.” *KSR Int’l Co. v. Teleflex Inc.*, 550 U.S. 398, 406 (2007). The question of obviousness is resolved based on the following underlying factual determinations: (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) objective evidence of nonobviousness, i.e., secondary considerations.⁵ *Graham v. John Deere Co.*, 383 U.S. 1, 17–18 (1966). “To satisfy its burden of proving obviousness, a petitioner cannot employ mere conclusory statements. The petitioner must instead articulate specific reasoning, based on evidence of record, to support the legal conclusion of obviousness.” *In re Magnum Oil Tools Int’l, Ltd.*, 829 F.3d 1364, 1380 (Fed. Cir. 2016). We analyze the asserted grounds with the principles stated above in mind.

B. Level of Ordinary Skill

Petitioner asserts that the proper level for ordinary skill in the art at the time of the invention would have been “at least a B.S. degree in electrical engineering, or equivalent thereof, and at least three to four years of experience in the relevant field, which includes video coding technology, or an M.S. degree in electrical engineering and at least two to three years of experience with video coding technology” with more education substituting for practical experience or vice versa. Pet. 4–5 (citing Ex. 1002, ¶¶ 18-22). Dr. Kalva, Patent Owner’s expert, generally agrees with Petitioner and Mr. Bross, Petitioner’s expert. See Ex. 2025 ¶ 17 (“While the credentials

⁵ The record contains no allegations or evidence of secondary considerations.

described by Mr. Bross could qualify one as a POSITA, . . . other definitions of a POSITA . . . would be acceptable as long as the POSITA’s credentials reflect a practical understanding of the design considerations and challenges associated with the video coding technology at issue in the ’673 Patent.”). No material dispute exists over the level of ordinary skill, and the record prior art references support Petitioner’s proposed level of ordinary skill.

Based on the evidence of record, including the types of problems and solutions described in the ’673 patent and the asserted prior art, we agree with and adopt Petitioner’s definition of the level of ordinary skill in the art.

C. Claim Construction

In an *inter partes* review filed before November 13, 2018, the Board interprets claims of an unexpired patent using the broadest reasonable construction in light of the specification of the patent. *See* 37 C.F.R. § 42.100(b) (2017); *Cuozzo Speed Techs., LLC v. Lee*, 136 S. Ct. 2131, 2144–46 (2016) (upholding the use of the broadest reasonable interpretation standard as the claim interpretation standard to be applied in an *inter partes* review); Changes to the Claim Construction Standard for Interpreting Claims in Trial Proceedings Before the Patent Trial and Appeal Board, 83 Fed. Reg. 51340 (Oct. 11, 2018) (noting that the changes apply to *inter partes* reviews filed on or after November 13, 2018). Under that standard, “words of the claim must be given their plain meaning, unless such meaning is inconsistent with the specification and prosecution history.” *TriVascular, Inc. v. Samuels*, 812 F.3d 1056, 1062 (Fed. Cir. 2016).

1. *Means-Plus-Function Claiming*

Petitioner argues that none of the terms should be subject to a means-plus-function interpretation. Pet. 8–11. Patent Owner does not address this issue, and asserts that all claim terms should be given their plain meaning. PO Resp. 46–47. We agree with Petitioner based on review of the entire record and further note that the parties do not raise any issues related to whether or not any term or phrase invokes a means-plus-function interpretation.

Claim 1 recites “transforming and quantizing, by a transform/quantization unit, a residual block of the prediction block to generate a quantized block.” In the Institution Decision, we determined for institution purposes that this phrase does not invoke 35 U.S.C. § 112, sixth paragraph, agreeing with Petitioner. See Inst. Dec. 8–10. We invited Patent Owner to provide input and construe the claim during this trial. See *id.* at 10. Patent Owner does not dispute the construction. The record supports our initial determination as set forth in the Institution Decision. *Id.* at 8–10.

2. *the “wherein” clause*

In the Motion to Amend, Patent Owner presents substitute claims, to be used “if the Board determines that the “wherein” clause [limitation [g]] of claim 1 of the ’673 Patent is determined to be conditional and not subject to patentable weight under *Ex parte Schulhauser*, Appeal No. 2013-007847 (PTAB. Apr. 28, 2016) (precedential) and its progeny.” Mot. Amend 1. In briefs on claim construction, Petitioner argues that limitation [g] should not be given patentable weight, and Patent Owner argues that limitation [g]

should be given patentable weight. Pet. Claim Const. Br. 1–2; PO Claim Const. Br. 1–3.

Claim 1 claims an image encoding method comprising six steps (limitations [b]–[g]). Limitation [d] recites “transforming and quantizing” “to generate a quantized block”. Limitation [g] recites the following “wherein” clause:

[g] wherein, when a size of the quantized block is equal to 8×8 , the quantized coefficients of the quantized block are divided into a plurality of subsets, and the quantized coefficients of each subset and the plurality of subsets are scanned according to a scan pattern determined by the intra prediction mode.

Petitioner argues that this limitation is not entitled to patentable weight because “[o]nly ‘when’ the condition is met (i.e. a size of the quantized block is equal to 8×8) are the ‘quantized coefficients of the quantized block [] divided’ and ‘the quantized coefficients of each subset and the plurality of subsets [] scanned’ as set forth in the claim.” Pet. Claim Const. Br. 1 (quoting claim 1). Petitioner argues that the result of this language is “two different methods recited in claim 1” and thus the clause is not entitled to patentable weight. *Id.* (citing *Ex parte Schulhauser; Unified Patents Inc. v. Vilox Techs., LLC*, IPR2018-00044, Paper 67 at 18-19, 21-22 (PTAB Apr. 18, 2019)). Petitioner notes that the Patent Owner’s expert confirmed that the steps set forth in the wherein clause need not always be performed. *Id.* at 2 (citing Ex. 1092, 43:23–47:9).

Patent Owner argues that the encoding set forth in the preamble (“image encoding method”) is achieved by the methodology recited in the wherein clause. PO Claim Const. Br. 1. Patent Owner points to the abstract

of the '673 patent as describing the division of quantized coefficients into the plurality of subsets, as recited in limitation [g], and that division and the scanning recited in limitation [g] as included in the summary of the disclosure, as well as in the detailed description relating to encoding and achieving increased video compression. *Id.* at 1–2. Thus, Patent Owner argues, “the wherein clause of claim 1 is integral to the invention.” *Id.* at 2, PO Resp. Claim Const. Br. 1–2.

In *Schulhauser*, a precedential decision, the Board considered a method claim in which some of the steps were recited as contingent on certain prerequisite conditions. *Schulhauser*, slip op. at 6–7. The Board found that the broadest reasonable interpretation of the claim encompassed situations in which the condition precedent for certain contingent steps had not been met, and thus the contingent steps were not required. *Id.* at 8–9.

Patent Owner argues that while *Schulhauser* “addressed a claim having separate, mutually exclusive conditional method steps,” claim 1 does not present this situation. PO Claim Const. Br. 3. We are not persuaded by this distinction. The claim addressed in *Schulhauser* included steps that were always performed, a step that was performed if a certain condition was met (“if the electrocardiac signal data is not within the threshold electrocardiac criteria”) and a set of steps that occurred if that condition was not met (“if the electro cardiac signal data is within the threshold electrocardiac criteria.”). *Schulhauser* at 2–3, 6–7. The Board determined that the “claim . . . as written covers at least two methods” — each corresponding to one of the two possibilities. *Id.* at 8.

Here, the plain language claim 1 makes limitation [g] contingent on

the size of the quantized block being equal to 8×8 . In other words, claim 1 as written covers at least two methods — one for the case where the size of the quantized block is not equal to 8×8 , in which steps [b]–[f] must be performed, and one for the case in which the size is equal to 8×8 , in which steps [b]–[f] and the actions of limitation [g] must be performed. The broadest of these two methods is the first, identical to the second except for not requiring the actions in limitation [g]. While Patent Owner argues that limitation [g] is necessary to increase the compression ratio, a stated aim of the invention, increasing the compression ratio is not recited as a limitation, and we do not find persuasive evidence in the record that this aim would not be met by other steps of the claimed method.

Contrary to Patent Owner’s arguments, the Specification indicates no need exists to divide all blocks into subsets and any division depends on the size of the block:

First it is determined *whether or not to divide quantized transform coefficients into a plurality of subsets. It depends on a size of transform block.* In other words, when the size of a transform block is equal to or larger than a predetermined size, the quantized transform coefficients are divided into a plurality of subsets. The predetermined size may be 8×8 or 16×16 . The plurality of subsets consist of one main subset and one or more residual subsets. The main subset is positioned at an upper left side including a DC coefficient, and the one or more residual subsets cover area other than area that the main subset covers.

Ex. 1001, 8:57–67 (emphasis added). This description reveals that a “quantized block” need not be equal to an 8×8 block in order to obtain an increased compression ratio or other unclaimed benefits of the invention.

See id. Additionally, contrary to Patent Owner’s arguments, the Specification shows that unclaimed benefits of the invention do not flow entirely or necessarily from the “wherein” clause. In particular, the Abstract of the ’673 patent states:

Also, an intra prediction mode of the current block is determined using reference pixels obtained by filtering reference pixels of the current block. *Accordingly, it is possible to minimize the amount of data required for the residual block of the current block.*

Ex. 1001, Abstract (emphasis added). This description shows how minimizing data (increasing the compression ratio) can occur by determining the intra prediction mode, a limitation recited in step [b] of claim 1.

Additionally, as Petitioner argues, Patent Owner’s expert testified that the actions of limitation [g] would not be performed, according to claim 1, if the size of the quantized block was not equal to 8×8. Pet. Claim Const. Br. 2 (citing, *inter alia*, Ex. 1092, 46:22–47:9).

In summary, we determine above that the “wherein” clause of limitation [g] is an optional limitation and the broadest reasonable interpretation of the claimed method includes instances in which the condition in limitation [g] is not met. Accordingly, the claimed method can be performed, or rendered obvious, with those steps performed when the condition is not met, and Patent Owner’s arguments to distinguish the cited prior art on the basis of limitation [g] are unavailing.

D. Asserted Challenges Based on Budagavi, Sole, and WD3-v1

Petitioner asserts that the combination of Budagavi and Sole renders obvious claims 1–3 of the ’673 patent and the combination of Budagavi,

Sole, and WD3-v1 renders obvious claims 4–7 under 35 U.S.C. § 103(a). Pet. 3–4. Petitioner relies on the testimony of Mr. Bross. See Ex. 1002. Petitioner also relies on Zheng⁶ “to show the knowledge of a POSITA at the time of the alleged invention.” *Id.* at 14 n.5, 47.

Patent Owner argues that neither Sole nor WD3-v1 are printed publications. PO Resp. 6–29. Additionally, Patent Owner argues that Petitioner would be estopped from asserting WD3-v1 is a printed publication based on the Federal Circuit’s *Infobridge* decision. PO Resp. 29–30. Patent Owner also argues that Sole does not teach or suggest limitation [g] (referred to by Patent Owner as “the Scanning Method Step”).

For the reasons below, Petitioner persuasively supports its challenges.

1. Effective Filing Date of the ’673 Patent

As an initial matter, Petitioner contends that WD3-v1 and Sole constitute prior art to the ’896 patent under 35 U.S.C. § 102(a). See Pet. 14. Petitioner contends that April 22, 2011 represents the effective filing date of the claims of the ’896 patent, based on the filing date of the ’896 patent’s ancestor application, the PCT/KR2011/002972 application (the “’972 PCT”). Pet. 12–13; Ex. 1001, [63]. The ’972 PCT claims priority to the filing date of Korean Patent Application No. 10-2010-0038158 (the “’158 Korean application” (Ex. 1013)), filed April 23, 2010. See Pet. 11–12; Ex. 1001, [63].

Relying on a certified English translation of the ’158 Korean

⁶ Zheng et al., *CE11: Mode Dependent Coefficient Scanning*, JCTVC-D393 (version 4) (uploaded Jan. 26, 2011) (Ex. 1008).

application (Ex. 1013), Petitioner contends it does not “provide adequate written description support for at least ‘when a size of the quantized block is equal to 8×8 , the quantized coefficients of the quantized block are divided into a plurality of subsets, and the quantized coefficients of each subset and the plurality of subsets are scanned according to a scan pattern determined by the intra prediction mode,’ as recited in claim 1 [of the ’673 patent].” Pet. 12 (citing Ex. 1001, 13:15–20; Ex. 1013 ¶¶ 11–14, 32, 75, 76, 78–81). Petitioner explains that although the cited paragraphs of the ’158 Korean application

discuss different subsets (e.g., main subset and residual subset) of quantized coefficients and different scan patterns (e.g., zigzag, vertical-first, horizontal-first), the application does not describe them in the context of an intra prediction mode (e.g., scanning quantized coefficients and subsets “according to a scan pattern determined by the intra prediction mode”) or a quantized block having the 8×8 size as recited in claim 1.

Id. at 12–13 (citing Ex. 1013 ¶¶ 78–81; Ex. 1002 ¶¶ 62–63).

Petitioner shows persuasively April 22, 2011 constitutes the effective filing date of the ’896 patent on this record. Patent Owner does not challenge this effective filing date in its Response.

2. *Collateral Estoppel*

The final written decisions in IPR2017-00099 (Exhibit 2001) and IPR2017-00100 (Ex. 2002) involve printed publication issues similar to those presented here. See *Samsung Electronics Co., Ltd. v. Infobridge PTE Ltd.*, Cases IPR2017-00099 & IPR2017-00100 (PTAB Apr. 23, 2018) (holding petitioner failed to show prior art references relied upon to show unpatentability qualify as printed publications) (collectively “Infobridge

IPRs” or “Infobridge FWDs” depending on the context). After the Oral Hearing, as noted above, our reviewing court issued a decision in appeals of the two Infobridge FWDs. *Infobridge*, 929 F.3d at 1374–75 (vacating and remanding for the Board to consider the public accessibility question) (“Infobridge” or “Federal Circuit’s Infobridge decision”). As also noted above, the parties filed additional briefing to address the impact of the Federal Circuit’s Infobridge decision.

Patent Owner’s Response contends “should the Federal Circuit affirm the Final Written Decisions of the Infobridge IPRs finding that WD4-v4 does not qualify as a printed publication, collateral estoppel will attach here.” PO Resp. 30. See *MaxLinear, Inc. v. CF CRESPE LLC*, 880 F.3d 1373, 1376 (Fed. Cir. 2018); *Bettcher Indus., Inc. v. Bunzl USA, Inc.*, 661 F.3d 629, 648 (Fed. Cir. 2011) (“the estoppel provision of [the prior reexamination version of] 35 U.S.C. § 315(c) applies only after all appeal rights are exhausted, including appeals to [the Federal Circuit]”). Petitioner agrees that a necessary condition for collateral estoppel to apply requires an affirmance by the Federal Circuit of the Infobridge FWDs; however, Petitioner also persuasively maintains that due to a lack of identical issues, with different documents, evidence and records involved here as compared to the Infobridge IPRs, collateral estoppel does not apply. See Reply 26–27.

In *Infobridge*, the Federal Circuit remanded the Infobridge FWDs for further fact finding by the Board to determine, inter alia, if circumstances underlying an email by Mr. Bross show public accessibility on that record, fact finding that relates to the public accessibility of WD3-v1 here, albeit on a different factual record. See *Infobridge*, 929 F.3d 1375 (“[W]e are

reluctant to assume that an email among potential collaborators should be treated the same as a public disclosure without clear findings by the Board.”); *id.* at 1374–75 (remanding to the Board to “consider[] whether Samsung’s evidence established that an ordinarily skilled artisan could have accessed the WD4 reference, after exercising reasonable diligence, based on the listserv email”).

Patent Owner argues that the Federal Circuit’s *Infobridge* decision provides the basis for collateral estoppel on the issue of whether uploading WD3-v1 to the JCT-VC or MPEG websites rendered it publicly accessible. *See* PO IB Br. 3. However, the case here includes different evidence than the *Infobridge* IPRs, evidence including testimony in Mr. Bross’s Supplemental Declaration (Ex. 1058), IDS filings listing JCT-VC documents at the PTO and similar evidence of accessibility of JCT-VC documents (Exs. 1070–73), and evidence about searching titles on the JCT-VC server (Ex. 1002; Ex. 1050; Ex. 1068), none of which the Federal Circuit’s *Infobridge* decision considers. *See* PO IB Br. 2–3 (discussing title search functionality; citing Ex. 2026, 135:20–136:14 (Mr. Bross’s deposition); Exs. 1071–72 (evidence related to JCT-VC document accessibility)).

In addition to the Federal Circuit’s *Infobridge* decision, several cases clarifying the law of public accessibility subsequent to the *Infobridge* FWDs. *See Medtronic, Inc. v. Barry*, 891 F.3d 1368, 1382–83 (Fed. Cir. 2018), *Jazz Pharm. Inc. v. Amneal Pharm., LLC*, 895 F.3d 1347, 1358 (Fed. Cir. 2018), and *GoPro, Inc. v. Contour IP Holding*, 908 F.3d 690, 694 (Fed. Cir. 2018). Based on the different evidentiary records, the remand by *Infobridge*, and the recent precedent clarifying public accessibility issues, Petitioner

persuasively argues collateral estoppel does not apply. *See* Pet. IB Br. 1 (“The Federal Circuit’s clarification of the proper legal standard on public accessibility supports a finding of printed publication based on the evidentiary record developed in this proceeding for both asserted references: WD3-v1 and Sole.”); *Infobridge*, 929 F.3d 1374–75 (remanding to the Board to “consider[] whether Samsung’s evidence established that an ordinarily skilled artisan could have accessed the WD4 reference, after exercising reasonable diligence, based on the listserv email”).

“Collateral estoppel, also known as issue preclusion, shields a defendant from having to litigate issues that have been fully and fairly tried in a previous action and decided adversely to a party.” *Pharmacia & Upjohn Co. v. Mylan Pharm., Inc.*, 170 F.3d 1373, 1379 (Fed. Cir. 1999). According to the Federal Circuit, “affirmance [of the Board’s decision] renders final a judgment of invalidity of the” patent under review by the Board. *XY, LLC v. Trans Ova Genetics, L.C.*, 890 F.3d 1282, 1294 (Fed. Cir. 2018) (emphasis added). Further, “an affirmance of an invalidity finding, whether from a district court or the Board, has a collateral estoppel effect on all pending or co-pending actions.” *Id.* (emphasis added)). In *Trans Ova Genetics*, *see id.*, the court cited and relied on *MaxLinear*, 880 F.3d 1373, in which the court similarly reasoned as follows: “Both parties agree that those prior decisions, having been affirmed by our court, are binding in this proceeding, as a matter of collateral estoppel, and they could hardly argue otherwise.” *Id.* at 1376 (emphasis added).

The reasoning in *Trans Ova Genetics* and *MaxLinear* quoted above indicates that collateral estoppel does not apply to the remand involved in

Infobridge. Based on the remand by *Infobridge*, different evidentiary records, the lack of identical issues, and the recent precedent clarifying public accessibility issues, Petitioner persuasively argues collateral estoppel does not apply. *See* Pet. IB Br. 1 (“The Federal Circuit’s clarification of the proper legal standard on public accessibility supports a finding of printed publication based on the evidentiary record developed in this proceeding for all three of the asserted references: *WD3-v1*, and *Sole*.”); Reply 26–27 (arguing collateral estoppel does not apply). Accordingly, we conclude collateral estoppel does not apply.

3. *Printed Publication*

As indicated above, the parties disagree over whether *WD3-v1* and *Sole* qualify as printed publications. The parties agree *WD3-v1* represents an output document, a document produced by the JCT-VC after the fifth (Geneva, March 2011) JCT-VC meeting, and *Sole* represents an input document, a document discussed during the fifth JCT-VC meeting, prior to the date of the invention.

a) *Overview of Petitioner’s Contentions*

According to Petitioner, *WD3-v1*, titled “WD3: Working Draft 3 of High-Efficiency Video Coding” and designated JCTVC-E603 (version 1), represents a version of a working draft of the HEVC standard specification under development at least as of August 9, 2011. *See* Pet. 4, 14–18; Ex. 1007, 1; Ex. 1036. Petitioner and its declarant, Mr. Bross, a co-author of *WD3-v1*, state that the Joint Collaborative Team on Video Coding (“JCT-VC”), was created in 2010 to develop the new generation HEVC standard (H.265) to replace the then-current (H.264) standard, and the JCT-VC

published WD3-v1 and Sole, among other documents, in pursuit of that goal. *See* Pet. at 16–17 (citing Ex. 1002 ¶¶ 202, 206; Exs. 1027–33); Ex. 1002 ¶¶ 201–202. Mr. Bross, and another of Petitioner’s declarants, Dr. Vetro (Ex. 1050), explain that the JCT-VC includes a group of video coding personnel from two parent organizations: Video Coding Experts Group (“VCEG”) and Moving Picture Experts Group (“MPEG”). Ex. 1002 ¶ 201; Ex. 1050 ¶ 17; Pet. 16 (citing same).

In general, Petitioner, Mr. Bross, and Dr. Vetro further state that upload dates to a JCT-VC server of WD3-v1 (Mar. 30, 2011) and Sole (Mar. 19, 2011), as verified by Exhibits 1035 and 1036, corroborated by evidence regarding uploading on the same dates to an MPEG server, as verified by Exhibits 1052 and 1053, the ability to search titles (with subject matter words) and authors on the JCT-VC site without restriction, all show public availability of the documents to a person of ordinary skill interested in the art. *See* Pet. 14–22 (citing Ex. 1002 ¶¶ 12–14, 200–208, 211–218; Ex. 1050 ¶¶ 15–17, 27–29; Exs. 1031, 1035, 1036, 1052, 1053, 1055).

In particular, Petitioner asserts that JCT-VC members uploaded the documents to the JCT-VC document management server available to the public at large, making them available for download without restrictions (e.g., without requiring a username and password). *Id.* at 16–17 (quoting a JCT-VC “general policy” as outlined in Ex. 1016, 2 (“In order to facilitate cross-organisational communication, all input and output documents of the JCT will be public (including the drafts of the coding specification, reference software, and conformance test data.”))).

Petitioner contends that since at least 2011 (i.e., after 2010) the JCT-VC site has been “organized in a hierarchical manner categorized by JCT-VC meeting numbers.” *Id.* at 17. According to Petitioner, a person of ordinary skill and interested in the art could have performed appropriate searches, e.g., by title and author, within a meeting page on the JCT-VC server to locate the documents. *Id.* at 17–18 (citing Ex. 1002 ¶¶ 209–211; Exs. 1035–37).

Petitioner also contends that since at least 2011, the parent bodies of the JCT-VC (Study Group 16 (VCEG–Video Coding Experts Group)) and ISO/IEC JTC 1/SC 29/WG 11 (MPEG–Motion Pictures Expert Group) (Ex. 1050 ¶ 16 nn.7–8), assigned an MPEG number to all JCT-VC documents and mirrored (uploaded) them onto the MPEG server, identified via the corresponding MPEG number. *See id.* at 18–19. Petitioner cites documents evidencing identical upload times for each document on the two servers. *Id.* at 19 (citing Ex. 1016, 2; Ex. 1002 ¶¶ 212–213; Ex. 1050 ¶¶ 18–20; *comparing* Exs. 1035–37, *with* Exs. 1052–54 (showing upload times on the two sites)). Although the MPEG server required a user to have a username and password, relying on Dr. Vetro’s testimony, Petitioner explains “these credentials were regularly distributed to hundreds of MPEG members.” *Id.* at 20 (citing Ex. 1050 ¶¶ 21–26). As indicated above, Petitioner notes that no such requirement existed for downloading from the JCT-VC server. *Id.* at 17.

Petitioner also contends that Mr. Bross disseminated WD3-v1 via a link within an email to the JCT-VC community, when Mr. Bross announced completion of WD3-v1 to JCT-VC members via an e-mail to the JCT-VC

reflector (an e-mail listserv) on March 30, 2011. *Id.* at 21–22 (citing Ex. 1002 ¶¶ 217–218). Petitioner contends “[a]s of March 2011, at least 225 participants subscribed to the reflector.” *See id.* at 22 (citing Ex. 1031, 1, 6, 208–11; Ex. 1002 ¶ 218; Ex. 1049 (Mr. Bross’s announcement to the JCT-VC reflector of the availability of WD3-v1)). In addition, Mr. Bross testifies “all communications between JCT-VC members were to be conducted using the reflector” to facilitate discussions by the JCT-VC Ad Hoc Groups on particular subject areas about the HEVC standard, and “any person [including interested individuals and member participants] could subscribe to the reflector.” Ex. 1002 ¶ 217 (citing Ex. 1031, 2, 208–211).

Petitioner also explains that the JCT-VC included “[v]ideo coding personnel from leading technology companies, universities, and research institutions” who “met quarterly for development of the new HEVC standard, starting in April 2010.” Pet. 16 (citing Ex. 1002 ¶ 202; Ex. 1026, 1). The JCT-VC considered a number of documents as part of the proposal process to develop the HEVC standards: “During these meetings, the JCT-VC considered proposals (‘input’ documents) submitted prior to the meeting and either during or after the meeting, ‘output’ documents were generated based on the proposals.” *Id.* (citing Ex. 1002 ¶ 202; Exs. 1027–33 (JCT-VC meeting reports)). The JCT-VC policy noted above (Ex. 1016, 2), to facilitate communication about the documents, required all input and output documents to be public, “at or near the time the drafts were completed.” *Id.* at 16 (citing Ex. 1002 ¶ 206; Ex. 1050 ¶ 17; Ex. 1016, 2).

Mr. Bross contends “based on my knowledge and recollection, given the prominence of the JCT-VC in the video coding industry, persons

interested in tracking the developments of the latest video coding standard would regularly visit the JCT-VC site to ensure that products and services they were developing were consistent with the HEVC Standard under development.” Ex. 1002 ¶ 206; *see also* Pet. 17 (citing Ex. 1002 ¶ 206). Mr. Bross testifies “I would also regularly download input documents (proposals) from the JCT-VC document management site (e.g., proposals that we were considering to incorporate into the Working Drafts).” Ex. 1002 ¶ 205.

Dr. Vetro corroborates Mr. Bross’s testimony regarding the MPEG parent body of the JCT-VC and other aspects, including JCT-VC’s general policy of making all documents on the JCT-VC website accessible, without restriction, including the documents at issue here. *See* Ex. 1050 ¶¶ 15–18. Dr. Vetro notes JCT-VC represents a joint group of video coding experts from the two above-noted parent bodies (MPEG and VCEG) created in 2010 to develop new generation HEVC standards. Ex. 1050 ¶ 16 (citing Exs. 1015, 1016, 1027) & nn.6–7 (citing Exs. 1015, 1016, 1019).

As the head of the U.S. delegation for the MPEG parent body, Dr. Vetro personally distributed credentials to about 200 US MPEG members, with Dr. Vetro’s counterparts (“other Heads of Delegation”) from other nations (“e.g., Korea, France”) (Ex. 1050 ¶ 22) distributing similar credentials to their respective 550 national members. *See* Pet. 20 (citing Ex. 1058 ¶¶ 21–26; Exs. 1056–64, 1066–67). Dr. Vetro testifies to “hav[ing] personal knowledge that these credentials were regularly distributed to around 750 MPEG members worldwide in the 2011 timeframe, including in March 2011.” Ex. 1050 ¶ 21. He describes “the MPEG members at that

time” as being “from renowned technology companies, universities, and research institutions.” *Id.* ¶ 22; *see also id.* ¶ 24 & n.15 (citing Ex. 1066, 19–28 (“a copy of the Report of the 97th MPEG meeting held at Politecnico di Torino, in Torino, Italy on July 18–22” as showing attendance by at least 491 other MPEG members)).

Regarding distribution and accessibility, Dr. Vetro testifies as follows:

Moreover, I am aware that once such credentials (e.g., passwords) were distributed to the MPEG members in the 2011 timeframe, *the documents on the MPEG site were widely available at least within the companies, universities, and research institutions of the MPEG members to other individuals (e.g., engineers) involved in video coding. I understand that at that time, such entities would distribute such documents so that individuals affiliated with such entities could keep up with the latest developments in the video coding standardization process(es), e.g., to ensure that products and services they were working on were compliant with the video coding standard(s).* Thus, I understand that the MPEG site and the documents stored thereon in the 2011 timeframe *were further accessible to thousands of individuals.*

Id. ¶ 23 (emphases added).

Dr. Vetro testifies that each of the JCT-VC documents at issue in this proceeding (i.e., Exs. 1006–07) were among those publicly available on the JCT-VC site and the MPEG site (with the server sites linked together, Ex. 1016, 2; Ex. 1050 ¶ 19) prior to the effective date of the invention. *See* Ex. 1050 ¶¶ 19–20, 27–29. At the relevant time frame in 2011, MPEG included about 750 MPEG members, and about 225 JCT-VC meeting participants attended the fifth JCT-VC meeting at issue here, with the JCT-VC under the auspices of well-known international bodies, including the ITU (a United

Nations (UN) specialized agency) and the International Organization for Standards (ISO) (Ex. 1017; Ex. 1020) to create the new HEVC standards. *See* Ex. 1050 ¶¶ 16–17, 21–25; Ex. 1020 (describing generic ISO standards); Ex. 1031, 2 (fifth meeting report).

Similar to the JCT-VC meeting reports announcing the website for accessing documents, from the outset (i.e., beginning with the first meeting report, April 2010 (Ex. 1028)), each meeting report announced the same “reflector to be used for discussions by the JCT-VC” (jct-vc@lists.rwth-aachen.de), and announced the same link “[f]or subscription to this list, see <http://mailman.rwth-aachen.de/mailman/listinfo/jct-vc>,” prominently on the first or second page of each report. Ex. 1028, 2 (first meeting report); Ex. 1029, 1–2 (second meeting report); Ex. 1030, 2 (third meeting report); Ex. 1027, 2 (fourth meeting report); Ex. 1031, 2 (fifth meeting report).

Petitioner also contends that since at least 2011, the JCT-VC server has been organized in a hierarchical manner categorized by JCT-VC meeting numbers. Pet. 17. According to Petitioner, a person of ordinary skill and a person interested in the art could have performed appropriate automatic word searches, for example, by title and author, within a meeting page on the JCT-VC site to locate the documents. *Id.* at 17–18 (citing Ex. 1002 ¶¶ 207–211; Exs. 1035–45).

Prior to the first meeting report, in January 2010, in the same document outlining the general policy of making documents public (i.e., “Terms of Reference of the Joint Collaborative Team on Video Coding Standard Development” (Ex. 1016)), the JCT-VC announced “[e]very contribution document to a meeting of the JCT should be registered in the

document registry and *uploaded to the electronic archive several days in advance of the meeting, to ensure that it is available for review by other participants.*” Ex. 1016, 2 (emphasis added). “Chairs will announce the precise deadline” for each meeting. *Id.* In addition, “[a]ll documents and contributions will be in electronic form.” *Id.* Moreover, “[f]or reasons of expediency, the JCT will maintain *a single document registry* and an electronic archive that are distinct from those of the parent bodies. The registry and archive will be linked to both the parent body web sites, and the parent bodies may ingest the JCT documents for their own reference and archival purposes.” *Id.* (emphasis added). In the third meeting report, the JCT-VC specified the “new document distribution site” (i.e., the just-described single document registry) as <http://phenix.it-sudparis.eu/jct/>. Ex. 1030, 2 (also announcing “[t]he new site allows a more automated process of document registration and download.”).⁷

b) Overview of Patent Owner’s Contentions

Patent Owner provides the following “Overview [o]f JCT-VC,” generally agreeing with Petitioner about the structure, organization, and meetings of the JCT-VC, for example, describing “input” documents “to be discussed during the meeting” and “draft” documents produced after meetings, including the relevant meeting at issue here, the fifth (Geneva) meeting in 2011:

⁷ Prior to the third meeting, JCT-VC used another site, according to the fourth meeting report: “Previously, JCT-VC documents had been made available at <http://ftp3.itu.int/av-arch/jctvc-site>, and documents for the first two JCT-VC meetings can be found there.” Ex. 1027, 7.

In 2010, the Joint Collaborative Team on Video Coding (“JCT-VC”) was created to develop a new generation High Efficiency Video Coding (“HEVC”) standard (H.265) to replace the then current H.264 standard. Ex. 1002, ¶201.

The JCT-VC includes a group of video coding personnel from two parent organizations: Video Coding Experts Group (“VCEG”) and the Moving Picture Experts Group (“MPEG”). Ex. 1002, ¶201.

JCT-VC members met quarterly for the development of the HEVC standard. Ex. 1002, ¶202.

A JCT-VC meeting took place in Geneva on March 16-23, 2011 (the “Geneva meeting”). Ex. 1031, 1.

JCT-VC members provided “input” documents to be discussed during the meeting. The number of input documents at the Geneva meeting was approximately 500. Ex. 1002, ¶202.

For a discussion of an input document, the presentation was limited to 5 minutes and 2 slides due to the “increasingly high workload for this meeting.” Ex. 1031, 6.

For those input documents agreed upon, changes would be made into a working draft “output” document sometime after the meeting. Ex. 1002, ¶202.

PO Resp. 5–6.

Patent Owner generally argues Petitioner does not show that WD3-v1 and Sole were publicly available prior to the date of the invention. *See* PO Resp. 1–29. In particular, Patent Owner argues that one of ordinary skill exercising reasonable diligence would not have been able to find the documents in the JCT-VC repository. *Id.* at 8–14, 18–29. Patent Owner argues that even if search functionality on the JCT-VC site existed before the invention, interested artisans could only search individual meetings, not the JCT-VC site as a whole. *Id.* at 7–18, 23–24. Additionally, Patent Owner argues that, with respect to the MPEG repository, the requirement of a password (which changed quarterly) and the confidential nature of the

document repository weigh against public accessibility of a reference. *Id.* at 15–18. Patent Owner also argues that Dr. Vetro’s testimony regarding the distribution of MPEG documents is unsupported and conclusory. *Id.* at 18. Patent Owner additionally argues that the email Mr. Bross references announcing the uploading of WD3-v1 and the other evidence presented by Petitioner is insufficient to render that document publicly accessible. *Id.* at 27–29.

c) Exhibits 1071 and 1072

Petitioner provides Exhibits 1071 and 1072 as Supplemental Information to show that interested artisans generally knew about different versions of documents from the JCT-VC as a prominent video coding standards body. *See* Paper 16, 4 (Motion to Submit Supplemental Information). In particular, interested artisans cited documents at the PTO in U.S. patent applications relating to different versions or variations of WD3 (all with the same JCT-VC document number JCTVC-E603). *See* Ex. 1071, 11, 86–89; Ex. 1072, 22–34; Paper 16, 2–3; Reply 13–14; Paper 22 (granting Motion to Submit Supplemental Information). Patent Owner does not dispute that the citations in the PTO patent applications refer to different versions of WD3.

Rather, Patent Owner argues Exhibits 1071 and 1072 provide evidence of file histories in the USPTO, but these file histories were not “publicly available prior to April 22, 2011, the effective filing date of the ‘896 patent.” PO Resp. 22. Patent Owner also contends “the inventors of both applications attended the Geneva meeting and thus these documents do not support Samsung’s JCT-VC ‘prominence’ theory nor do they not suggest

interested artisans regularly visited the JCT-VC in 2011.” *Id.* (citing Ex. 1031, 210, 211).

Notwithstanding Patent Owner’s arguments, the file histories corroborate the JCT-VC’s policy of making JCT-VC documents public. As discussed above and further below, no restrictions on dissemination of any document existed under the JCT-VC. *See* Exs. 1027–32 (meeting reports); Ex. 1016, 2 (JCT-VC’s general policy, making all documents public on a single JCT-VC server prior to each meeting and as an archive as a general policy); Ex. 1002 ¶¶ 205–206; Ex. 1050 ¶ 17; Ex. 1031, 8 (fifth meeting report describing communication practices, including use of the email reflector and document website); Ex. 1027, 7 (fourth meeting report describing same). That JCT-VC contributors or members listed JCT-VC documents on the IDS documents further supports that they were able to access the documents and the intent by the JCT-VC to make all the JCT-VC documents public. It further shows the prominence of the JCT-VC because meeting participants filed U.S. patent applications, evidencing skill in video coding by those members.

d) Budagavi

As discussed in the Institution Decision, Petitioner presents evidence that Budagavi (filed December, 2010) cites to the same JCT-VC working group that issued Sole and helped promulgate the HEVC standards, further indicating artisans of ordinary skill should have known about the JCT-VC working group, the standards, and the publications about the standards. *See* Ex. 1005 ¶ 6; Ex. 1006, 1; Ex. 1002 ¶ 146; Pet. 50 (citing Ex. 1005 ¶ 6; Ex. 1006, 1; Ex. 1002 ¶ 146). Inst. Dec. 24; *see also* Ex. 1005 ¶ 24 (listing

“ITU-T/ISO High Efficiency Video Coding (HEV) standard” with other known standards, including “MPEG-1, MPEG-2, and MPEG-4, the ITU-T video compression standards, e.g., H.263 and H.264”). Budagavi further indicates the prominence of the JCT-VC as promulgating the HEVC standard. Patent Owner does not challenge this preliminary findings in the Institution Decision, which the record supports after final consideration thereof.

e) Exhibit 1070

Petitioner submits Exhibit 1070 as Supplemental Information to corroborate the prominence of the JCT-VC and to show other interested artisans outside of JCT-VC would have known about the JCT-VC. *See* Paper 16, Paper 22. Exhibit 1070 represents an IEEE “Special Section on the Joint Call for Proposals on High Efficiency Video Coding (HEVC) Standardization,” published in an IEEE trade journal, IEEE TRANS. CIRC’s and SYSTEMs for VIDEO TECH., V. 20, No. 12 (Dec. 2010), about a year prior to the effective date of the invention. Ex. 1070, 1–3. The IEEE “Special Section” describes how “the *premier video coding standardization organizations*, namely the ITU-T Video Coding Experts Group (VCEG) and the ISO/IEC Moving Picture Experts Group (MPEG), have been actively seeking emerging developments to identify when the next major step forward in compression capability would become feasible.” *Id.* at 1–3 (emphasis added). It describes “an agreement . . . reached in January 2010 to establish a Joint Collaborative Team on Video Coding (JCT-VC) and to issue a joint Call for Proposals (CfP).” *Id.* (citing Joint Call for Proposals on Video Compression Technology, ITU-T SG16 Q6 document VCEG-AM91

and ISO/IEC JTC1/SC29/WG11 document N11113, ITU-T SG16 Q6 and ISO/IEC JTC1/SC29/WG11, Kyoto, Japan, Jan. 2010.”).

The “Special Section” initially describes the first “commercially successful digital video compression standard,” which “emerged 20 years ago,” and “resulted in an explosion of products and services that created consumer video technology as we know it today.” *Id.* at 3 (emphasis added). It notes “[e]ach international video coding standard has been built on a foundation of knowledge from the preceding generation, and has enabled an expanding array of product offerings and design improvements, as video support spread into a more diversified set of applications—particularly including Internet streaming and personal videotelephony, among others.” *Id.* (emphases added).

The “Special Section” not only provided prominent notice as an IEEE publication to interested artisans about the JCT-VC and the promulgation of new standards with the “project name of the high efficiency video coding (HEVC)” (*id.* at 5), it also described the first JCT-VC meeting held in Dresden in April 2010 (Ex. 1070, 3) and referenced the meeting report for the first meeting, JCT-VC200 (Ex. 1070, 6 reference 8), which in turn, Petitioner filed as Exhibit 1028. The first meeting report (JCT-VC200, Exhibit 1028) describes the intent to standardize HEVC and also describes how to register for the email reflector (Ex. 1028, 2), consistent with the descriptions published (uploaded to the JCT-VC server) in the all the meeting reports prior to the date of the invention, and after, including the second through the fifth meeting reports that Petitioner also filed as exhibits. Ex. 1028, 2 (first meeting report); Ex. 1029, 1–2 (second meeting report);

Ex. 1030, 2 (third meeting report); Ex. 1027, 2 (fourth meeting report); Ex. 1031, 2 (fifth meeting report).

Besides the first meeting report (JCT-VC200), the “Special Section” article cites at least seven other JCT-VC documents that the JCT-VC published pursuant to the first meeting dealing with HEVC, namely, JCTVC-A114, JCTVC-A116, JCTVC-A119, JCTVC-A202, JCTVC-A203, JCTVC-A204, and JCTVC-A205. *Compare* Ex. 1070, 6 references 7, 9–14 (cited references), *with* Ex. 1033, 51–55 (listing and describing the reference documents at the first meeting). Even though the IEEE “Special Section” authors (Ex. 1070, 7–8) also attended the first JCT-VC meeting and contributed thereto (*see* Ex. 1028, 1, 56–57), the “Special Section” notified other interested artisans, in an “influential” IEEE journal, about the prominence of JCT-VC and of the existence of JCT-VC publications in December 2010 for creating HEVC standards by publishing the article and references in a prominent IEEE trade journal.⁸ *See* Ex. 1068 ¶ 12 (“[T]his Journal was one of the most influential technical journals in the video coding field in the 2010-2011 timeframe (and even later).”). That the Special Section authors contributed to the JCT-VC further shows the intent to make all HEVC documents public.

⁸ Two of the Special Section authors, Gary J. Sullivan (Microsoft) and Jens-Rainer Ohm (RWTH Aachen), also authored the first meeting report and other meeting reports. They and other Special Section authors, such as Thomas Wiegand (Fraunhofer HHI / TU Berlin) and W.J. Han (Samsung Electronics), actively contributed to the JCT-VC, with WD-3-v1 listing Mr. Ohm, Mr. Han, and Mr. Sullivan as co-authors or contacts with Mr. Bross, *See* Ex. 1007, 1; Ex. 1027, 1; Ex. 1031, 1; Ex. 1031, 1; Ex. 1070, 1, 6–8.

Patent Owner responds that Exhibit 1070 “does not . . . suggest interested artisans regularly visit[ed] the JCT-VC in 2011.” PO Resp. 21. This argument ignores that the “Special Section” article appears in an influential 2010 IEEE trade journal (which Patent Owner does not dispute), describes the first JCT-VC meeting, and describes the JCT-VC as a collaboration of “the premier video coding standardization organizations” to promulgate HEVC. Ex. 1070, 3. In other words, the argument does not undermine Petitioner’s showing based on the prominence of the JCT-VC as cited in this influential IEEE trade journal publication.⁹

*f) JCT-VC Prominence, Accessibility, and
Testimony by Mr. Bross, Dr. Vetro, and Dr. Kalva*

Patent Owner argues that Mr. Bross and Dr. Vetro provide conclusory and factually unsupported testimony about the actions of others. PO Resp. 2–3, 17–18. Patent Owner further characterizes the testimony of Mr. Bross as “allegations . . . that are either uncorroborated or based on impermissible hearsay, or a combination of both.” *Id.* at 3 (citing Ex. 2001, 16; Ex. 2002,

⁹ Petitioner also relies on other exhibits, including Exhibits 1073 and 1074, which include translations of website documents related to MPEG. Patent Owner raises issues related to the date of the documents. *See* PO Resp. 22. We need not address Exhibits 1073 and 1074 further (and do not rely upon them), given the weight of evidence discussed above and further below.

17–18); *see also* Motion to Exclude Evidence *infra* § IV (moving to exclude Ex. 1068 ¶¶ 10–11).¹⁰

The disputed testimony relates to assertions by Dr. Vetro and Mr. Bross regarding the accessibility of documents by JCT-VC members and non-members. For example, with respect to Dr. Vetro, Patent Owner refers to his testimony relied upon by Petitioner “that MPEG members distributed documents uploaded to the MPEG document repository to individuals within the companies, universities, and research institutions of the MPEG members.” PO Resp. 3; *see* Pet. 20; Ex. 1050 ¶ 23. With respect to Mr. Bross, Patent Owner refers to the following testimony: “[B]ased on my knowledge and recollection, given the prominence of the JCT-VC in the video coding industry, persons interested in tracking the developments of the latest video coding standard would regularly visit the JCT-VC site to ensure that products and services they were developing were consistent with the HEVC Standard under development.” PO Resp. 20 (quoting Ex. 1002 ¶ 206); *see also* Ex. 1068 ¶¶ 10–13 (similar testimony by Mr. Bross discussed further below).

Contrary to Patent Owner’s arguments, other evidence, besides the testimony of Mr. Bross and Dr. Vetro, including Exhibit 1070 and statements by Dr. Kalva, corroborate the prominence and public awareness

¹⁰ Relying on findings in the *Infobridge* FWDs, Patent Owner disputes the weight of certain testimony by Mr. Bross and Dr. Vetro, but only seeks to exclude two paragraphs of Mr. Bross’s testimony in his Supplemental Declaration. *See infra* § III (Motion to Exclude Evidence). As indicated throughout, the record here differs from the *Infobridge* IPRs, leading this panel to a different conclusion about the weight to afford the testimony.

of the JCT-VC, showing that interested members exercising reasonable diligence reasonably should have been able to obtain JCT-VC documents “if they wanted to.” See *GoPro*, 908 F.3d at 693 (“[W]e explained that ‘[a]ccessibility goes to the issue of whether interested members of the relevant public could obtain the information if they wanted to’ and ‘[i]f accessibility is proved, there is no requirement to show that particular members of the public actually received the information.’” (quoting *Constant v. Advanced Micro-Devices, Inc.*, 848 F.2d 1560, 1569 (Fed. Cir. 1988)); *Infobridge*, 929 F.3d 1374 (“The Board’s decision to reject Samsung’s evidence because it did not establish that enough interested and ordinarily skilled artisans *actually obtained the WD4 reference* was therefore erroneous.” (emphasis added))).

As indicated above (*supra* § II.D.3.a), Mr. Bross testifies, *inter alia*, that the “JCT-VC includes a group of video coding personnel from two parent organizations (ITU-T Study Group 16 (VCEG) and ISO/IEC JTC 1/SC 29/WG 11 (MPEG).” Ex. 1002 ¶ 201 (internal footnotes omitted); see Ex. 1020, 1 (describing ISO, the International Organization for Standards, as “an independent, non-governmental international organization with a membership of 163 national standards bodies”); Ex. 1002 ¶ 201 n.69 (describing ISO and the IEC (citing Ex. 1020, 3; 1022, 1)). In addition, as noted above, Mr. Bross testifies that JCT-VC fell under the auspices of the two parent groups, ITU-T (International Telecommunication Union Standardization Sector) Study Group 16 (VCEG (Video Coding Experts Group) and ISO/IEC JTC 1/SC 29/WG 11 (MPEG)—i.e., ultimately under the auspices of the ISO and the United Nations (UN)—international groups

to promulgate a *world-wide set of standards*. Ex. 1002 ¶ 201 nn.68–69. For example, the affiliated JCT 1 group “provides a standards development environment where video coding personnel come together to develop *worldwide ICT standards* for business and consumer applications.” *Id.* ¶ 201 n.69 (citing Ex. 1022, 1) (emphasis added). Dr. Vetro, who acted as “US Head of Delegation for MPEG, provides similar testimony. *See* Ex. 1050 ¶¶ 15–17.

The record shows that JCT–VC created international HVEC standards (as a joint project of the MPEG and VCEG parent groups under international auspices, including the UN and ISO). Mr. Bross and Dr. Vetro corroborate each other’s testimony because they both testify that as leaders familiar with the process of promulgating the world-wide prominent HEVC standards, no restrictions existed in disseminating documents based on the JCT-VC policy (Ex. 1016, 2). As discussed further below, the testimony and supporting evidence generally show that given the prominence of the JCT-VC, interested artisans would have kept abreast of the latest HEVC standards, informing their respective institutions about HEVC documents and developments, including accessing them for product compliance. *See* Ex. 1002 ¶¶ 206; Ex. 1050 ¶¶ 5–17, 22, 23; Ex. 1068 ¶¶ 10–13 (citing Ex. 1080); Pet. 17 (citing Ex. 1002 ¶ 206).

In supplemental briefing, to counter the testimony of Mr. Bross and Dr. Vetro, Patent Owner contends Dr. Kalva “testified that people in the industry did not regularly visit the JCT-VC website.” PO IB Rep. Br. 3 (citing Ex. 2025 ¶ 114). Unlike the testimony of Mr. Bross and Dr. Vetro, however, no corroborating testimony exists for Dr. Kalva’s statement.

Although Dr. Kalva testifies he “did not regularly visit the JCT-VC website” and he was “not aware of anyone I was working with at the time in the video coding industry who would do as Mr. Bross suggests,” Dr. Kalva does not explain how he would have known about the absence of “regular[] visit[s]” by others. *See* Ex. 2025 ¶ 114.

Moreover, Dr. Kalva’s deposition testimony indicates his interest in video coding did not involve the HEVC standards in 2011. *See* Ex. 1092, 117:22–119:7. Rather, he testifies he had a “different focus” and “probably was doing different things” and because of “time” constraints, was not involved in the video coding standards being developed by the JCT-VC. *Id.* at 115:17–116:9. In short, although Dr. Kalva states “I was actively working in the video coding field and interested in the developments of the latest video coding standard” at the time of the invention (Ex. 2025 ¶ 114), his deposition testimony clarifies he “probably was doing different things” than investigating the emerging HEVC standards (*see id.* at 115:17–116:9), so his testimony bears little weight on the issue at hand.¹¹

Dr. Kalva’s testimony also shows that he did not have the knowledge that Mr. Bross and Dr. Vetro possessed about JCT-VC policies and procedures. *See* Ex. 1092, 125: 2–7 (“I participated in MPEG activities. I never participated in -- at that time in joint JCT-VC and MPEG activities.”). As noted above and below, Mr. Bross and Dr. Vetro explain that based on their knowledge as leaders of MPEG and JCT-VC, they understood

¹¹ Similarly, the Kalva Declaration does not describe any work in HEVC, but it does describe work related to MPEG-4 (from 1997–99) and generally describes other video work and teaching in the field. *See* Ex. 2025 ¶¶ 8–13.

interested artisans at least evinced an intent to visit the JCT-VC and MPEG websites to obtain knowledge of emerging standards and transfer the knowledge to their respective institutions. *See* Ex. 1002 ¶¶ 12–14, 202–206; Ex. 1050 ¶¶ 5–17, 22, 23; Ex. 1078 ¶¶ 10–13. Mr. Bross’s testimony also specifically shows interested artisans made specific inquiries about the website, namely “inquiries . . . regarding when they could expect the next update to the Working Draft of the HEVC Standard to be uploaded to the JCT-VC site and circulated on the JCT-VC listserv.” Ex. 1068 ¶ 11. This testimony regarding inquiries (as opposed to declaratory statements, see *infra* Section IV), provides another factual foundation from which Mr. Bross, testifying as a lay witness, properly may base an inference about an intent by interested artisans to visit the website and ensure HEVC compliance. *See id.*

In addition, Dr. Kalva’s testimony does not quantify what “not regularly visit” means. *See* Ex. 2025 ¶ 114. Mr. Bross also does not quantify what “regularly visit” means explicitly, but provides context: “[P]ersons interested in tracking the developments of the latest video coding standard would regularly visit the JCT-VC site *to ensure that products and services they were developing were consistent with the HEVC Standard under development.*” Ex. 1002 ¶ 206 (emphasis added). With no interest in HEVC or HEVC product development, it makes sense that Dr. Kalva and others he worked with would “not regularly visit” the website. For this reason also, the testimony provides minimal weight and lacks probative value.

Mr. Bross testifies to “chairing breakout groups within JCT-VC” and “represent[ing his] employer,” to “propos[e] technical contributions to the HEVC standard” (Ex. 1002 ¶ 203), and “[b]ased on . . . knowledge” gained through his experience, “persons interested in tracking the developments of the latest video coding standard would regularly visit the JCT-VC site to ensure that products and services they were developing were consistent with the HEVC Standard under development” (*id.* ¶ 206). Similarly, Dr. Vetro distributed credentials to provide access to documents to world-wide MPEG members “from renowned technology companies, universities, and research institutions” so that “such entities could keep up with the latest developments in the video coding standardization process(es), e.g., to ensure that products and services they were working on were compliant with the video coding standard(s).” Ex. 1050 ¶¶ 22–23.¹² Another document of record (but not of record during the *Infobridge* IPRs), corroborates this testimony by showing artisans of ordinary skill, or other interested artisans, knew (or should have known) in general of various JCT-VC documents (including WD3-v1 and Sole) prior to the date of the invention. See Ex. 1070, 3, 6 reference 8 (IEEE Journal “Special Section” article citing the first JCT-VC meeting report (Ex. 1016) and describing JCT-VC’s new HEVC

¹² Even though Dr. Vetro’s testimony relates to further distribution within companies after an MPEG member initially retrieves a document from the MPEG server, the testimony corroborates Mr. Bross’s testimony that institution members would have further disseminated HEVC updates to others in the institution to ensure HEVC product development and compliance (i.e., regardless of the specific server source). See Ex. 1058 ¶ 23; Ex. 1050 ¶¶ 10–13; Ex. 1002 ¶ 206.

project); Ex. 1016 (announcing a general JCT-VC policy with “a single document registry and an electronic archive that are distinct from the parent bodies” to implement the new standards beyond H.264); Ex. 1027 (fourth meeting, announcing and specifying the JCT-VC website as existing prior to the third meeting: “The documents for the meeting can be found at <http://phenix.it-sudparis.eu/jct/>. This is a relatively new site that the group transitioned to using just prior to the preceding meeting.”).

Mr. Bross cites the “Special Section” article (Exhibit 1070) discussed above (§ II.D.3.e) as describing JCT-VC as the “premier video coding standardization organization,” noting the predecessor standard to HEVC “resulted in an explosion of products and services that created consumer video technology as we know it today,” and further noting “[e]ach international video coding standard has been built on a foundation of knowledge from the preceding generation, and has *enabled an expanding array of product offerings and design improvements.*” Ex. 1068 ¶ 12 (quoting Ex. 1070, 3 (emphasis added)). Exhibit 1020 further corroborates this testimony by showing “[i]nternational standards . . . give world-class specifications for products, services and systems, to ensure quality, safety and efficiency. They are instrumental in facilitating international trade.” *Id.* at 1 (emphasis omitted).

During his deposition, Mr. Bross also testified as follows about the meeting registration and further dissemination of information from a meeting:

So everyone who registers picks up a badge and goes to the meeting, yes. . . . And also, the badge [does] not come with any restriction on confidentiality. So everyone picking up the

badge can go to the meeting, listen to the discussion, come back to university, . . . to a company, [and] talk to the colleagues about what has been discussed at the meetings.

Ex. 2026, 137:18–25.

The fourth and fifth meeting reports each list hundreds of employee members and their affiliated world-wide organizations. *See* Ex. 1027, 1, 208–211 (248 listed attendees); Ex. 1031, 1, 254–257 (225 or 226 listed attendees). The record, therefore, supports the credible testimony of Dr. Vetro and Mr. Bross who merely state the expected result that interested artisans would have intended to keep their organizations abreast of what they sent their employees to do—promulgate and track world-wide standards (HEVC) for emerging video products for international trade. Unlike a thesis stored at a university library in Germany, *see In re Hall*, 781 F.2d 897, 897–900 (Fed. Cir. 1986), or a microfiche stored in a patent office in Australia, *see In re Wyer*, 655 F.2d 221, 226–27 (CCPA. 1981), the entire purpose of JCT-VC, which stored all its documents on a single server accessible to anyone, in order to promulgate HEVC standards under the auspices the UN and ISO, necessarily includes the underlying purpose of disseminating the information to facilitate world-wide trade. *See* Ex. 1020, 1 (“International Standards **make things work**. They give world-class specifications for products, services and systems, to ensure quality, safety and efficiency. They are instrumental in facilitating **international trade**. . . . International Standards impact everyone, everywhere.”); Ex. 1016, 1–2 (“In order to facilitate cross-organisational communication, all input and output documents of the JCT will be public,” and “the JCT will maintain a single

document registry and an electronic archive that are distinct from those of the parent bodies.”

g) The Email and JCT-VC Prominence

As noted above (§ II.D.3.a), Petitioner provides persuasive evidence that Mr. Bross disseminated a link to WD3-v1 via email (Ex. 1049) to about 225 members of the JCT-VC community announcing completion of WD3-v1 via an e-mail reflector (an e-mail listserv) on March 30, 2011. Pet. 15, 21–22 (citing Ex. 1002 ¶¶ 217–218); Ex. 1002 ¶¶ 217–218 (Mr. Bross testifying about his announcement to the JCT-VC reflector of the availability of WD3-v1 to about 225 listserv recipients); Ex. 1031, 1–2, 6, 208–211 (fifth meeting summary, describing about 225 meeting participants and describing listserv reflector and link to subscribe to list); Ex. 1049 (email). Petitioner contends “[a]s of March 2011, at least 225 participants were subscribers of the reflector.” Pet. 22 (citing Ex. 1031, 1, 6, 208–211; Ex. 1002 ¶ 217). Mr. Bross also testifies to a JCT-VC server upload date and public availability of March 30, 2011 for WD3-v1, prior to the effective filing date of the invention. Ex. 1002 ¶ 214 (citing Ex. 1036 (showing upload date); Ex. 1053 (mirror to MPEG server with same upload date)).

Patent Owner contends “even if the email announcement of WD3-v1’s availability on the JCT-VC website was received by 225 members of the JCT-VC, such evidence is insufficient to render WD3-v1 publicly [accessible] because WD3-v1 was not disseminated at the [July 2011 Torino] meeting, as it did not even exist until after the meeting.” PO Resp. 28 (citing *GoPro*, 908 F.3d at 695 (“[T]he GoPro Catalog was disseminated

with no restrictions and was intended to reach the general public.”)).¹³

Petitioner persuasively responds “[t]he fact that distribution occurred after an extensive discussion and development of *WD3-v1* in Geneva only further demonstrates its public accessibility.” Reply 24.

Although the GoPro catalog involved actual dissemination, similarly to the GoPro catalog, the email with a server link to *WD3-v1* rendered *WD3-v1* accessible on March 30, 2011 (Ex. 1049) “with no restrictions and . . . intended to reach the general public,” to about 225 members possessing ordinary skill and interested in the subject matter, prior to the effective date of the invention, April 22, 2011. *See GoPro*, 908 F.3d at 695; *supra* II.D.3.a (discussing the email); Ex. 1002 ¶ 218; Reply 24. Like the GoPro catalog, the email contains no confidentiality restrictions to recipients about further dissemination. *See* Ex. 1049.

Mr. Bross testifies that the email announcement provided further public availability. Ex. 1002 ¶ 217 (“In addition to *WD3-v1* being publicly available on the JCT-VC site and the MPEG site at least on March 30, 2011, it was disseminated to the JCT-VC community by e-mail.”), ¶ 218 (“I

¹³ Patent Owner contends Petitioner “asserts for the first time in its Reply that Mr. Bross’ e-mail reporting *WD3-v1* was ‘effectively a research aid and provided a sufficiently definite roadmap’ for locating *WD3-v1*.” PO Sur-Reply 11 (quoting Reply 21). Contrary to this argument, Petitioner raised Mr. Bross’s email announcement and reflector in its Petition. *See* Pet. 21–22 (“*WD3-v1* was also publicly available on March 30, 2011 because it was disseminated to the JCT-VC community by e-mail,” and “Mr. Bross announced completion of *WD3-v1* to the JCT-VC members via the JCT-VC reflector on March 30, 2011.”). Also, Patent Owner filed a Sur-Reply addressing the issue.

widely distributed WD3-v1 to about 225 individuals via the JCT-VC reflector at least on March 30, 2011, although based on my knowledge and recollection, I believe that the number of individuals subscribed to the JCT-VC reflector in at least 2011 must have been much greater than 225 at that time.”). As a matter of routine email practice, without any restrictions in the email or anywhere else and with a general JCT-VC policy of public disclosure as discussed above (Ex. 1002 ¶ 206; Ex. 1031, 1–2, 6; Ex. 1016, 2), anyone on the listserv receiving the typical single-page email easily could have forwarded the email with WD3-v1 link to other interested artisans in order to keep their institutions abreast of the latest HEVC developments. See Ex. 1049; Ex. 1002 ¶¶ 205, 206, 217; Ex. 1050 ¶¶ 17, 23; Ex. 1068 ¶¶ 10–13.

In other words, as Petitioner argues, Mr. Bross’s email announcement (Ex. 1049) provides a mechanism for interested artisans to obtain WD3-v1 readily. See Reply 20–21 (citing Ex. 1049; Ex. 1002 ¶¶ 214, 218). In particular, the email (Ex. 1049) describes and provides a link to the “initial draft” of WD3-v1 to “participants and interested individuals of the JCT-VC” (Ex. 1002 ¶ 217) who, in turn, readily could have forwarded the standard email to their interested colleagues. See Ex. 1049; Ex. 1002 ¶ 218 (“I widely distributed WD3-v1 to about 225 individuals via the JCT-VC reflector at least on March 30, 2011, although based on my knowledge and recollection, I believe that the number of individuals subscribed to the JCT-VC reflector in at least 2011 must have been much greater than 225 at that time.”). Petitioner persuasively shows that Mr. Bross disseminated a direct link to WD3-v1 to at least about 225 members of the JCT-VC, persons

interested and ordinarily skilled in the relevant art, and any member of the public could have requested and received access to the JCT-VC reflector that announced and provided a link to WD3-v1 via email. Ex. 1002 ¶¶ 217–218; Ex. 1028, 1–2 (first meeting report uploaded June 9, 2010 describing the link and how to join the listserv reflector); Ex. 1027, 1–2 (fourth meeting report uploaded March 14, 2011 describing same); Ex. 1031, 1–2 (fifth meeting report uploaded July 18, 2011 (after the effective date of the invention) describing same).

Regarding the listserv, Patent Owner argues “Mr. Bross does not provide any corroborating documentation demonstrating who actually applied, much less when they applied,” so that “his factually unsupported and conclusory statements concerning the alleged number of people subscribed to the JCT-VC reflector circa 2011 are not credible.” PO Resp. 27. Although Patent Owner disputes the specific number and types of artisans on the listserv, Patent Owner does not dispute that some interested artisans received the email. Tr. 62:11–12 (stating “certainly . . . there’s a certain number of people” on the listserv, “obviously people on the working groups”).

Mr. Bross provides corroboration by citing, *inter alia*, the Meeting Report of the Fifth meeting of the Joint Collaborative Team on Video Coding (JCT-VC), Geneva, CH, 16–23 March 2011. Ex. 1002 ¶ 217 (citing Ex. 1031, 2)). He testifies that at least 225 JCT-VC members attended the fifth JCT-VC meeting in Geneva in March 2011, and he testifies that he distributed the email to at least 225 persons skilled in the art using the email reflector, on March 30, prior to the date of the invention). *Id.* ¶¶ 217–218

(citing Ex. 1031, 1–2, 160, 208–211; Ex. 1049). Further relying on the corroborating meeting report, he testifies “based on my knowledge and recollection, in at least 2011, all communications between members related to the development of the HEVC standard were to be conducted via the JCT-VC reflector (jct-vc@lists.rwth-aachen.de).” *Id.* ¶ 217 (quoting Ex. 1031, 2 (“The reflector to be used for discussions by the JCT-VC and all of its AHGs [Ad Hoc Groups] is the JCT-VC reflector: jct-vc@lists.rwth-aachen.de.”), 166 (“The ad hoc groups established to progress work on particular subject areas until the next meeting are described in the table below [second entry of table includes Working Draft 3]. The discussion list for all of these ad hoc groups will be the main JCTVC reflector (jct-vc@lists.rwth-aachen.de).”).

The fifth (Geneva) meeting report that Mr. Bross cites states “[a]pproximately 225 people attended the JCT-VC meeting,” thereby corroborating his testimony. Ex. 1031, 1. And the email, dated March 30, 2011, further corroborates his testimony by specifying the same reflector specified in Exhibits 1028 (first meeting report) and 1031 (fifth meeting report) as the target: “**To:** jct-vc@lists.rwth-aachen.de”). Ex. 1049, 1.

The fifth (Geneva) meeting report also describes “three particularly important output documents from the meeting,” including “the HEVC specification Working Draft 3 (WD3).” Ex. 1031, 1. As discussed above, each of the meeting reports, beginning with the first meeting through the fifth, corroborate the testimony by announcing the existence of the same listserv reflector as the mechanism for communication at JCT-VC meetings and describing how to join it. See Ex. 1028, 2 (First meeting report: “The

reflector to be used for discussions by the JCT-VC and all of its AHGs is the JCT-VC reflector: jct-vc@lists.rwth-aachen.de. For subscription to this list, see <http://mailman.rwth-aachen.de/mailman/listinfo/jct-vc>.”); Exs. 1027, 1029, 1030–31 (same reflector and subscription information). And as noted above (§ II.D.3.e), a prominent IEEE publication (Ex. 1070) announced the JCT-VC group as promulgating the new video HEVC standards, describes the first JCT-VC meeting, and cites the first meeting report (*id.* at 6 reference 8) (Ex. 1028), which contains instructions for joining the reflector in April 2010 just like the subsequent meeting reports. Ex. 1028 (first meeting report), 1–2; Ex. 1029 (second meeting report)), 1–2; Ex. 1030 (third meeting report), 1–2; Ex. 1027 (fourth meeting report), 1–2; Ex. 1031 (fifth meeting report), 1–2; PO Resp. 27 (citing Ex. 1031, 2 and discussing the reflector).

Given the importance of WD3-v1 and the prominence of JCT-VC in standardizing HEVC coding, interested persons receiving the email announcements readily had the means and adequate reason to forward the email to other interested persons, as indicated above. Other interested artisans would have been interested in joining the listserv based on the meeting reports and the announcement of the IEEE “Special Section” (Exhibit 1070). The link reasonably would have led interested artisans and their employer institutions to WD3-v1 on the JCT-VC server.

Accordingly, Petitioner shows persuasively that interested members of the relevant public, including ordinary artisans within world-wide companies, universities, and research institutions, both members and non-members of JCT-VC (including MPEG parent members), would have been

interested in, and should have been able to, join the listserv and should have been able to access the international HEVC standards document WD3-v1, by either joining the listserv, receiving the email, or receiving a forwarded version of it, at least in order to ensure HEVC product compliance. *See* Ex. 1002 ¶¶ 217–218; Ex. 1050 ¶ 23; Ex. 1068 ¶¶ 10–13; Ex. 1028; Ex. 1021.

h) Discussing WD3-v1 and Sole at JCT-VC Meetings

Relying on the fifth (Geneva) meeting report, Petitioner contends “WD3-v1 was distributed, without any confidentiality restriction, to that meeting’s attendees (and, likely, others).” Reply 24. Petitioner points out “the JCT-VC meeting reports expressly state that ‘[t]he reflector [is] to be used for discussions by the JCT-VC.’” *Id.* at 25 (citing Ex. 1031, 2; Ex. 1032, 2).

Regarding WD3-v1, Mr. Bross testifies about a discussion of input documents that contributed to WD3-v1, including “the residual coding CABAC syntax and symantics” added to WD3-v1. *See* Ex. 1068 ¶¶ 18–20 (citing Ex. 1031, 81–83).

Petitioner also shows “the Geneva meeting report includes a summary of the discussion of Sole at that meeting.” Reply 24–25 (citing Ex. 1031, 83, 147–148; Ex. 1068 ¶¶ 18, 20–21). As Petitioner notes, the fifth “meeting report includes a summary of the discussion of Sole at that meeting.” *Id.* (citing Ex. 1031, 147–148). In addition, Mr. Bross testifies about a “discussion of JCTVC-335 [Sole]” in the fifth meeting report section primarily documenting the discussion of another input document “JCTVC-227” (adopted into WD3-v1), and testifies the fifth meeting report

documents “the decision to further study *Sole*’s proposal as part of a core experiment (‘CE’).” Ex. 1068 ¶ 21 (citing Ex. 1031, 83, 147–48).

Summarizing in his Supplemental Declaration and referring to his Declaration, Mr. Bross testifies that meeting participants discussed input documents (such as *Sole*) in order to consider them as part of the HEVC standard in the WD3-v1 output document:

The discussions in these meetings included the contents of the *WD3-v1*, *Sole*, and *Zheng* references that I discussed in my opening declaration. (See, e.g., Ex. 1002 at ¶¶ 50-60, 133-199.) For example, as I explained in my opening declaration and above, during the JCT-VC meetings, the JCT-VC considered proposals in “input” documents submitted prior to the meeting, and the proposals in input documents that were agreed upon would be incorporated into a working draft of the HEVC Standard specification after the meeting (e.g., an “output” document). (Ex. 1002 at ¶ 202.) In fact, as the JCT-VC meeting notes confirm, one of the most important “output” documents produced from the meeting was the working draft of HEVC such as Working Draft 3 produced as a result of the discussions and presentations of the input documents during the fifth JCT-VC meeting. (Ex. 1031 at 1 (“The JCT-VC produced three particularly important output documents from the meeting . . . [including] the HEVC specification Working Draft 3 (WD3)”)).

Ex. 1068 ¶ 18.

Patent Owner contends that “the only record evidence indicates *Sole* was discussed for no more than 5 minutes during the meetings that took place over the course of 8 consecutive days and involved the discussion of over 500 input documents.” PO Sur-Reply 9 (citing Ex. 1031, 1, 6); *see also* PO IB Br. 2 (arguing “[t]he only record evidence indicates each ‘presentation[] should not exceed 2 slides and 5 minutes.’” (citing Ex 1031,

6). Patent Owner concludes “[t]his fleeting discussion of Sole is simply not enough to show these documents were publicly accessible.” PO Sur-Reply 9 (citing *In re Klopfenstein*, 380 F.3d 1345, 1350 (Fed. Cir. 2004)). Patent Owner also contends the meeting reports do not indicate, *inter alia*, “what topics were discussed, to what level of detail they were discussed, how many people participated in the discussions, the length of the discussions,” and other related items. *Id.* at 10.¹⁴

¹⁴ Relying on the *Ibex* FWD in IPR2018-00012, Patent Owner also asserts that Petitioner failed to present the argument that “Sole is a printed publication because it was allegedly ‘disseminated’ because it was presented and discussed during the fifth JCT-VC meeting” in its Petition, so the allegedly new argument exceeds the proper scope of the Reply. PO Sur-Reply 8–9. Contrary to Patent Owner’s argument, unlike the cited *Ibex* IPR, Petitioner fairly raised the issue in the Petition and Motion to File Supplemental Information (Paper 16), which the panel granted as proper (Paper 22), and Patent Owner filed a Sur-Reply to address the issue. Describing regular JCT-VC meetings, the Petition states “[d]uring these meetings, the JCT-VC considered proposals (‘input’ documents) submitted prior to the meeting and either during or after the meeting, ‘output’ documents were generated based on the proposals.” Pet. 16 (citing Exs. 1027–33 (JCT-VC meeting reports)). The Petition also cites to the JCT-VC’s general policy (Ex. 1016), stating it requires “all input and output documents of the JCT will be public,” “to facilitate . . . communication.” Pet. 16 (quoting Ex. 1016, 2). As indicated herein, the cited fifth meeting report reveals discussions of the documents. So the Petition reasonably apprises Patent Owner of Petitioner’s position regarding discussion of the documents and the Sur-Reply provides further notice and opportunity to respond. See *VirnetX v. The Mangrove Partners Masters Fund*, Nos. 2017-1368, -1383, slip op. at 1 (Fed. Cir. July 8, 2019) (“After VirnetX argued to the Board that Petitioners’ reply raised new arguments, the Board authorized VirnetX to file a sur-reply to respond to the arguments that it contended

No dispute exists over the fact that JCT-VC conferees discussed WD3-v1 and Sole during the fifth meeting. *See* PO IB Reply Br. 3 (arguing “alleged conversations [about documents] were with JCT-VC members” (citing Ex. 2026, 135:20–136:14). The fifth meeting report supports Petitioner and shows conferees discussed Sole (JCTVC-E335) for a sufficient manner of time to resolve specific technical issues to implement as part of the standards as documented in the output document WD3-v1. For example, after the fifth meeting report describes the “contribution” as proposing two methods and describes the two methods in a detailed summary, the report states “[f]urther study in CE (including investigation of RDOQ on for second method) was recommended.” Ex. 1031, 147–148. Another document cited immediately after Sole, JCTVC-473 (titled “Verification of JCTVC-E335: Scans for coefficient level coding with CABAC [F. Bossen (DOCOMO USA Labs)] [late registration 2011/03/17]”) refers to Sole (i.e., “Verification of JCTVC-E335,” and states the following: “Confirms the results on first method. Duplicate code for the case of 4x4 blocks is avoided due to the unified scan.” *Id.* at 148. In the section documenting a discussion of input document JCTVC-227 cited by Mr. Bross (Ex. 1050 ¶ 21), the fifth meeting report refers to Sole as follows: “New contributions JCTVC-E335 [Sole] and JCTVC-E344 (which is characterized as building on JCTVC-E338) seem related also. JCTVC-E335

were improperly raised,” providing VirnetX with “an adequate notice and opportunity to respond.”) (nonprecedential).

[Sole] *seems less closely related, so it can be discussed separately.*” Ex. 1031, 83 (emphasis added).

The recommendation by the JCT-VC conferees to adopt the second method in Sole, and to discuss Sole separately (i.e., apart from the JCTVC-227 discussion), provides persuasive evidence that JCT-VC conferees discussed Sole in a sufficient manner to indicate accessibility to the document. The weight of evidence also shows different conferees accessed the documents in order to discuss them, and like all the prior JCT-VC meetings, no confidentiality restrictions existed at the relevant fifth meeting. *See* Ex. 1050 ¶ 17 (citing Ex. 1016, 2); Ex. 1068 ¶¶ 17–21; Ex. 1028 (first meeting report), 1–2; Ex. 1030 (third meeting report), 1–2; Ex. 1027 (fourth meeting report), 1–3; Ex. 1031, 1–2 (fifth meeting report, describing the listserv and noting “the document distribution site <http://phenix.it-sudparis.eu/jct/> was used for distribution of all documents.”); Ex. 1016, 1–2 (JCT-VC general policy of making all documents public on a single server). Even if conferees did not actually access the final version of WD3-v1 and Sole during the discussions thereof, evidence suggests that at least some of the attendees necessarily must have been aware of Sole and its contents and accessed it at some point prior to the discussion to prepare for the discussion at the relevant meetings to reach intricate decisions about each document, including how to incorporate it into WD3-v1. *See* Ex. 1016, 1–2; Ex. 1031, 1–2, 83, 146–47.

At the least, meeting participants and other interested artisans should have been able to access Sole and WD3-v1 “if they wanted to.” *See GoPro*, 908 F.3d at 693 (“[W]e explained that ‘[a]ccessibility goes to the issue of

whether interested members of the relevant public could obtain the information if they wanted to’ and ‘[i]f accessibility is proved, there is no requirement to show that particular members of the public actually received the information.’” (quoting *Constant*, 848 F.2d at 1569)). As discussed above (§ II.D.3.a), beginning in January 2010, the JCT-VC announced that meeting participants should upload all documents (from both parent bodies) to a single JCT server (linked to both parent bodies) prior to the meetings with precise upload deadlines prior to the meetings. Ex. 1016, 1–2 (“Terms of Reference of the Joint Collaborative Team on Video Coding Standard Development”: announcing “[e]very contribution document to a meeting of the JCT should be registered in the document registry and *uploaded to the electronic archive several days in advance of the meeting, to ensure that it is available for review by other participants.*” (emphasis added)). The JCT-VC also noted “[c]hairs will announce the precise deadline” for uploading documents prior to each meeting. *Id.*

Then, after announcing the Terms of Reference of the JCT, starting in October 2010 in the third meeting report, the series of meeting reports each inform artisans and meeting participants that all documents were available on the JCT-VC server at the document distribution site <http://phenix.it-sudparis.eu/jct/>. Ex. 1030, 1 (Third meeting: “A new document distribution site <http://phenix.it-sudparis.eu/jct/> became operational shortly before the Guangzhou meeting and was exclusively used for distribution of all documents.”); Ex. 1027, 2 (fourth meeting reporting “the document distribution site <http://phenix.it-sudparis.eu/jct/> was used for distribution of all documents”); Ex. 1031, 2 (fifth meeting reporting same).

Evidence of record shows an intent and requirement to make all the documents available prior to each meeting on a known website available to the public without restriction, showing that interested members of the public inside and outside of the JCT-VC would have been aware of the emerging HEVC standards and should have been able to obtain documents related to the standards on the JCT-VC website. *See* Ex. 1002 ¶¶ 208–218; Ex. 1050 ¶¶ 19–20; Ex. 1020, 2; Ex. 1070; Ex. 1068 ¶¶ 10–13, 18–21. With no restrictions on dissemination (Ex. 1016, 2 (i.e., “all input and output documents of the JCT will be public”)), conferees would have been able to further disseminate the documents to non-JCT-VC interested persons in their respective institutions, in order to keep their institutions apprised of their efforts and the emerging HEVC standards, as the above-discussed testimony of Mr. Bross and Dr. Vetro indicates. Or any artisan interested in the emerging world-wide HEVC standard and reading the article filed as Exhibit 1070 and exercising reasonable diligence should have been able to contact the JCT-VC or a listed JCT-VC member or contact, or author if Exhibit 1070 (or the IEEE) to obtain Sole and WD3-v1 as part of the latest HEVC developments prior to the date of the invention.

i) *Searching by Key Words for Title and Author*

Patent Owner argues Petitioner fails to present sufficient evidence of search functionality in 2011 to locate Sole or WD3-v1. *See* PO Resp. 11–14, 19–24. Patent Owner also argues Petitioner “failed to present evidence sufficient to establish that an interested person of ordinary skill in the art would have been motivated to search for or could have found WD3-v1 in the JCT-VC document repository exercising reasonable diligence.” *Id.* at 24

(citing *SRI Int’l, Inc. v. Internet Sec. Sys., Inc.*, 511 F.3d 1186, 1194 (Fed. Cir. 2008)). According to Patent Owner, finding the documents would have involved “unreasonable steps.” *See id.* at 23–24 (listing alleged steps). Patent Owner argues an interested searcher first must select the correct fifth meeting to find Sole and WD3-v1, and then look through 500 documents within the fifth meeting directory. *See id.*

These arguments do not relate to Petitioner’s showing regarding Mr. Bross’s email, which provided a direct link to WD3-v1.

Patent Owner agrees with Petitioner that “Sole was . . . one of the approximately 500 input documents considered for incorporation into the HEVC Standard under development at the Geneva meeting.” PO Resp. 2 n.2 (citing Ex. 1002 ¶ 202). As discussed above, citing the testimony of Mr. Bross and Dr. Vetro, Petitioner provides evidence that since at least 2011, the JCT-VC and the MPEG servers were organized in a hierarchical manner categorized by JCT-VC meeting numbers. Pet. 17–18 (citing Ex. 1002 ¶¶ 207–210; Ex. 1050 ¶¶ 26–29; Exs. 1034–45).¹⁵ According to Petitioner and Mr. Bross, in 2011, a person of ordinary skill and interested in the art could have performed appropriate searches, by keywords of the title and author, within a meeting page on the JCT-VC site to locate the uploaded documents. *Id.* (citing Ex. 1002 ¶¶ 207–210; Exs. 1035–45); Ex. 1002

¹⁵ Members of both parent bodies of JCT-VC, including MPEG, and nonmembers, should have known about the JCT-VC server as announced at the outset to be “a single document registry . . . distinct from those of the parent bodies.” Ex. 1016, 2; Ex. 1050 ¶ 19; Ex. 1002 ¶ 212; *see supra* §§ II.D.3.a, II.D.3.g.

¶ 209. As an example, Mr. Bross testifies “at that time, the JCT-VC site had search capability in March 2011, such person(s) understood and would have expected to find, and could have found, the working draft for the HEVC standard at that time by using the search capabilities of the JCT-VC site using common terms, such as ‘working draft’ or ‘draft’ or ‘High Efficiency Video Coding’/‘High-Efficiency Video Coding’ or variants thereof within the meeting page to locate a working draft document.” Ex. 1002 ¶ 209. Mr. Bross generally testifies “the meeting page on the JCT-VC site included search functionality with search fields including title and author.” *Id.* (citing Ex. 1034).¹⁶

Mr. Bross also testifies about search capabilities “in 2011” and “including January through April, 2011.” Ex. 1068 ¶ 8. Mr. Bross also testifies he “recall[s] and us[ed] this [search] functionality” during 2011 and performing a search in “January–April 2011” “would have narrowed down the results to a handful of documents.” Ex. 1068 ¶ 8. Regarding motivation for searching HEVC documents, as determined above (§ II.D.3.g–h), Petitioner provides persuasive evidence and argument that persons interested in video technology would have sought to keep abreast of the latest HEVC

¹⁶ The Federal Circuit’s *Infobridge* decision states that the petitioner there did not present evidence of search capability to the Board. *See Infobridge*, 929 F.3d at 1371 (“Samsung presented ‘no evidence that one could search for or locate [the] WD4 [reference] based on its subject matter.’” (quoting the Board’s *Infobridge* FWD, 2018 WL 1940480 at *7)); *accord id.* at 1373 (“[T]he Board . . . noted that the structure of the website, which organized content by meeting and lacked a way to search by subject matter, meant that a person would only find the WD4 reference if they knew where to look.”).

standards. *See, e.g.*, Ex. 1020, 1 (describing the relationship between ISO standards and world trade); Ex. 1070 (describing a similar relationship and describing the HEVC standards); Ex. 1002 ¶ 206; Ex. 1050 ¶ 23; Ex. 1068 ¶¶ 10–13.

For WD3-v1, titled “WD3: Working Draft 3 of High-Efficiency Video Coding” (Ex. 1007), an artisan interested in the latest video coding prior to the date of the invention in late 2011, could have entered a search term such as “video coding” after navigating to one of the latest meetings before the date of the invention, including the most recent meeting in Torino, to find that document. Mr. Bross credibly testifies “Exhibit 1047 shows search results for the term ‘high-efficiency video coding’ in the document register for the Geneva meeting,” and “[a]s shown, only one document resulted from that search, again the one document being Working Draft 3 (including version 1 of Working Draft 3).” Ex. 1002 ¶ 210.

Patent Owner does not address this specific evidence about WD3-v1. However, relying on one of the recent *Ibex* cases, Patent Owner contends Petitioner “provided no evidence that Sole’s title contains terms that an interested POSITA would have searched.” PO Sur-Reply 4 (citing *Samsung Elecs. Co., Ltd. v. Ibex PT Holdings Co., Ltd.*, Case IPR2018-00012, Paper 30, 18–19 (PTAB Apr. 10, 2019)). Quoting the same case, Patent Owner also argues Petitioner failed to provide “evidence or argument that [] the . . . search terms from the title of [Sole] are meaningful search terms” or “**why** a[n] [interested POSITA] would search the documents of the [fifth] JCTVC meeting using any terms from [Sole’s] title.” *Id.* (quoting *Ibex*, slip op. at 17. But in the particular *Ibex* Board case that Patent Owner relies upon, the

document at issue, Zhou II, lacked any meaningful search terms, unlike here. *See Ibex* IPR2018-00012, Paper 30 at 17 (“Nor has Petitioner provided any argument of evidence as to why a person interested and skilled in the art would search the documents of the sixth JCT-VC meeting using any terms from Zhou II’s title “Evaluation results on A.09, A.13–16 and an alternative solution.”). In other words, in the *Ibex* FWD in IPR2018-00012, only terms like “evaluation,” “alternative,” “results,” and “A.09” appear in the title of Zhou II, i.e., either generic terms or a lexicographic term like A.09, in either case, terms likely known only to the authors.

Here, Mr. Bross testifies that “the meeting page on the JCT-VC site included search functionality with search fields including title and author.” Ex. 1002 ¶ 209. His testimony shows that an artisan of ordinary skill interested in high efficiency coding technologies in the 2011 timeframe could have used “common terms” applied to searchable titles. *See* Ex. 1002 ¶ 209. Like WD3-v1, Sole bears a descriptive title: “Unified Scans for the Significance Map and Coefficient Level Coding in High Coding Efficiency.” *Supra* note 3. Therefore, similar to using “high-efficiency video coding” to locate WD3-v1, an interested person readily should have been able to enter well-known search terms in the related topic of scanning, including scan, scans, coefficient, coefficient level coding, or coding efficiency, to locate Sole on the JCT-VC server after exercising reasonable diligence

Petitioner also provides persuasive reasons why interested persons would seek documents related to the latest HEVC standards—e.g., so that they could have developed and sold products on the market complying with the latest video coding standards or at the least gain knowledge about the

standards. *See* Ex. 1002 ¶ 206; Ex. 1050 ¶ 23; Ex. 1068 ¶¶ 10–13; Ex. 1080, 3; Ex. 1020, 1.

Contrary to Patent Owner’s arguments about the mechanics of searching (*see* Sur-Reply 4–5), a searcher navigating the website to the *most recent* meeting (i.e., sometime during or after the meeting but before the effective filing date of the invention) would not have had to navigate through all the meetings to the correct meeting site in a random fashion, rather a reasonable searcher at the relevant time only would have needed to select the most recent meeting (i.e., the fifth meeting) to obtain the most recent documents (or if required, work back from the fifth meeting). *See* Reply 20 & n.13 (arguing at the time of the invention, “only five JCT-VC meetings had occurred, and it would have been reasonable for a skilled artisan interested in the latest Working Draft (or the input documents considered in its preparation) to have consulted the folder for the most recent meeting—that in Geneva.” (citing Ex. 1002 ¶¶ 209–210; Exs. 1034, 1046–48; Ex. 1068 ¶ 8; Ex. 1068 ¶¶ 8, 10–13)).

Such navigation and title searching would have been reasonable in comparison to traveling to a remote library in Germany or patent office in Australia and searching there, as Petitioner persuasively argues:

It was reasonable for a skilled artisan to travel to Germany and search a paper library catalog, *In re Hall*, 781 F.2d 897, 897–900 (Fed. Cir. 1986), or travel to Australia and search the patent office’s microfiche. *In re Wyer*, 655 F.2d 221, 226–27 (C.C.P.A. 1981). An artisan interested in video coding could certainly visit the JCT-VC website and perform simple title searches in the Geneva meeting document register to locate the then most current working draft (WD3) or the technical topic covered by

Sole, and even to scroll through the Geneva register to locate these documents. (Ex. 1002, ¶¶ 209–210; Ex. 1068, ¶¶ 4–9.)

Reply 21. Nothing in *Wyer* or *Hall* indicates a hypothetical searcher knew the specific document would be at the German library or the Australian patent office. *See Wyer*, 665 F.2d at 226–27 (finding accessibility under factors including intent to make public, number of copies, and other factual inquiries such as classification and indexing); *Hall*, 781 F.2d at 899 (similar inquiries relying on a general library procedure as to indexing, cataloging, and shelving of theses to find accessibility).

By analogy, like the classification in *Hall* and *Wyer* with no publication of a specific document, the JCT-VC server itself involves a meaningful classification and an intent to make public, because interested artisans outside of the JCT-VC would have known at least that the server contains a class of HEVC documents, making it a narrower target than an entire library or patent office (in another country), which involve multiple classifications.¹⁷ *See, e.g.*, Ex. 1016, 2 (announcing “a single document registry and an electronic archive”); Ex. 1070 (describing JCT-VC in an IEEE publication and citing the first meeting report). In addition, the search of the FTP server involved in *SRI*, 511 F.3d at 1196, involved a much more involved and nuanced searching scheme than a simple navigation to a meeting cite followed by a “customary” word search of a title (or author). *See id.* at 1196 (“[T]he FTP server did not contain an index or catalogue or

¹⁷ The JCT-VC server also includes categorization by different meetings (in different cities), like different libraries in different cities, albeit with a mouse-click for traveling.

other tools for *customary and meaningful research*. Neither the directory structure nor the README file in the PUB subdirectory identifies the location of papers or explains the mnemonic structure for files in the EMERALD subdirectory, or any subdirectory for that matter. In fact, the EMERALD subdirectory does not contain a README file. . . . [D]espite his knowledge of the field, FTP servers, and the paper, Dr. Bishop apparently would not have found the reference without Mr. Porras’s precise directions.” (emphasis added)).

Prior to the Oral Hearing and the Federal Circuit’s *Infobridge* decision, in a series of emails and Orders, the panel granted permission for the parties to discuss the impact of the *Ibex* FWDs during the Oral Hearing. See Ex. 2035 (allowing argument to address *Ibex* FWDs in IPR2018-00092, -00093, -00094 & -00095 per Patent Owner’s request); Paper 38 (allowing argument to address the *Ibex* FWD in IPR2018-00012); Ex. 3002 (Petitioner seeking permission to file briefing regarding the *Ibex* FWD in IPR2018-00012); Paper 44, 3 (granting parties permission to “raise new arguments . . . addressing recent cases” during the Oral Hearing). During the Oral Hearing, Petitioner compared a relevant *Ibex* decision in IPR2018-00012 involving Zhou II as described above, arguing “the title of that specific input document may not have been descriptive.” Tr. 32:15–16. In contrast, Petitioner mentioned search terms related to titles at issue in this proceeding (and the related ’696 and ’697 proceeding), such as “memory,” “compression,” and “memory compression,” generally pointing to terms for artisans interested in the “video compression field” or “high efficiency video coding standards.” See *id.* at 30:5–6.

During Patent Owner's response period, the panel asked Patent Owner, "[l]et's take someone who's interested in 'scanning,' . . . wouldn't it make sense to just put the word 'scan' in?" *Id.* at 64:14–16. The panel pointed out that in the *Ibex* FWD in IPR2018-00012, the title of the document at issue, Zhou II, "Evaluation Results on A09, A13 to A16, and an alternative solution," "wasn't very descriptive at all," but here, we appear to have a "different" title issue with respect to searching a title. *See id.* at 65:13–17; *see also id.* at 64:24–65:4 ("People do it with Google every day . . . [T]he principle[']s the same. You look for a word that you think might be relevant, it seems.").

Patent Owner responded that Petitioner "clearly knew this was a critical issue, did not proffer any evidence to say that . . . [documents] could be identified by title." *Id.* at 65:5–66:2. Patent Owner explained

if . . . you could have used the word "scan," Samsung clearly would have said so. They said it with respect to the working draft, and I think the Board can take comfort in that fact, that [Petitioner] clearly knew this was a critical issue, did not proffer any evidence to say that . . . [documents] could be identified by title.

Id. at 65:23–66:2.

Thus, Patent Owner does not dispute Petitioner's general position that an interested artisan searching for a title should have been able to find a descriptive title using a descriptive word in that title. *See* Pet. 17 (arguing "the meeting page on the JCT-VC site included search functionality with search fields including title and author" (citing Ex. 1002 ¶¶ 209–210)). Patent Owner only argues Petitioner did not provide evidence about *specific* descriptive words used in the search field for the title of Sole and argues

Sole bears a generic title. *See* Tr. 57:18–24; Sur-Reply 3–4. But this argument does not undermine the thrust of Petitioner’s showing, namely, an interested artisan exercising reasonable diligence should have been able to use a descriptive word in a descriptive title to find a particular document after going to the most recent meeting site, with Sole and WD3-v1 each having descriptive words in their respective titles as noted above.¹⁸

In re Lister, 583 F.3d 1307 (Fed. Cir. 2009), reasons that searching a title (or indexing by title), where the title bears a significant relationship to the subject matter, should be sufficient under appropriate circumstances. *Lister* states “the Lister manuscript *was publicly accessible* as of the date that it was included in either Westlaw or Dialog, *the databases that permitted keyword searching of titles.*” *Lister*, 583 F.3d at 1316 (emphases added). Distinguishing cases, *Lister* reasons

[i]n contrast [to *Hall*], the thesis at issue in *In re Bayer* was held not to have been publicly accessible as of the critical date because at that time it was uncatalogued, unshelved, and could have been found in the library at the University of Toledo “only by one having been informed of its existence by the [author’s] faculty committee, and not by means of the customary research aids available in the library.”

¹⁸ An interested person attempting to look through 500 titles one-by-one would have had three options after gaining access to the JCT-VC server and navigating to the most recent meeting site (the fifth meeting site): Quit searching, search one-by-one through all the titles, or attempt to circumvent the frustrating exercise by searching for the title using well-known search functionality at the time. The record suggests interested artisans exercising reasonable diligence and motivated to find a relevant document related to a particular HEVC standard subject would not have quit searching and probably would have tried to enter a relevant search term of interest.

Lister, 583 F.3d at 1312 (quoting *In re Bayer*, 568 F.2d 1357, 1361 (CCPA 1978)).

Jazz, decided after the *Infobridge* IPRs, cautions against strict adherence to easily searchable websites as a single factor, and the JCT-VC website provides a searchable title field after a user reaches a particular meeting site (only five meetings occurred prior to the date of the invention (see Ex. 1002 ¶ 202; Ex. 1037; Ex. 1038)). See *Jazz*, 895 F.3d at 1359 (“We have consistently held that indexing or searchability is unnecessary for a reference to be a printed publication under § 102(b).”); see also *Suffolk Techs. LLC v. AOL Inc.*, 752 F.3d 1358, 1365 (Fed. Cir. 2014) (stating “a printed publication need not be easily searchable after publication if it was sufficiently disseminated at the time of its publication” and analogizing the relatively unknown difficult-to-search FTP server involved in *SRI* as akin to “placing posters at an unpublicized conference with no attendees” (quoting *SRI*, 511 F.3d at 1197)).

In *Jazz*, “considering the multiple factors discussed above favoring public accessibility,” including a finding that an artisan of ordinary skill likely “was interested in drug distribution, safety, and abuse,” and “would have had reason to look to the Federal Register and FDA Advisory Committee meeting notices,” the court deemed a sufficient indexing factor to be that “the Federal Register *was indexed with a table of contents organizing notices by agency.*” *Jazz*, 895 F.3d at 1359 (quoting the Board’s findings (emphasis added)). On balance, Petitioner shows a reasonable searcher interested in the latest HEVC documents should have been able to enter a search term at the most recent JCT-VC meeting site on the server

archiving HEVC documents to find Sole and WD3-v1 based on their respective titles.

j) *Summary Analysis*

Citing a case subsequent to the *Infobridge* FWDs, namely *Medtronic, Inc. v. Barry*, 891 F.3d at 1382–83, *GoPro* states “our case law directs us to also consider the nature of the conference or meeting; whether there are restrictions on public disclosure of the information; expectations of confidentiality; and expectations of sharing the information.” *Go Pro*, 908 F.3d at 694; *accord Jazz*, 895 F.3d at 1358 (“[The relevant] materials were distributed via public domain sources with no possible expectation that the materials would remain confidential or not be copied. We have consistently emphasized the importance of such expectations in determining whether a reference is publicly accessible.”) (citing *Medtronic*, 891 F.3d at 1382; *Cordis Corp. v. Boston Scientific Corp.*, 561 F.3d 1319, 1333–34 (Fed. Cir. 2009); *In re Klopfenstein*, 380 F.3d at 1351; *Mass. Inst. of Tech. v. AB Fortia*, 774 F.2d 1104, 1108–09 (Fed. Cir. 1985)).

For the reasons stated above, Petitioner shows that the JCT-VC’s policy included making all materials on the JCT-VC website publicly available without any restrictions, with the “nature” of the JCT-VC meetings open, with no “restrictions on public disclosure,” with no “expectations of confidentiality,” and with “expectations of sharing the information,” *see Go Pro*, 908 F.3d at 694, so that the world market of video products could reap the benefits of the new HEVC standards, tipping the balance toward a finding of public accessibility. The following additional evidence also all supports the finding of public accessibility: filing meeting reports for all

relevant meetings listing the JCT-VC website and reflector policy, discussing documents including WD3-v1 (at least the non-final version thereof prior to its output) and Sole during meetings, requiring documents to be uploaded prior to meetings, sending an email announcing WD3-v1 and its location without restriction as to forwarding the email, writing an article in an influential IEEE journal to announce the JCT-VC's new HEVC project (Ex. 1080), and further publicizing the JCT-VC by citing documents thereto (Ex. 1071–72 and Budagavi).

The entire purpose of the JCT-VC, a standards organization under the auspices of the UN and ISO, was to promulgate new HEVC standards and update the previous standards, making documents about the standards public, with updated video standards fostering world-wide trade. *See, e.g.*, Ex. 1016, 1–2; Ex. 1020, 1; Ex. 1080, 3; Ex. 1002 ¶ 206; Ex. 1050 ¶ 23; Ex. 1068 ¶¶ 10–13). The intent to make all JCT-VC/HEVC documents public distinguishes this case from cases cited by *Infobridge* as instructive on that record, namely a thesis case, *Bayer*, 568 F.2d at 1357 (concluding that “[a]ccessibility to appellant’s thesis by the three members of the graduate committee under the circumstances of the present case” did not demonstrate that the work was publicly accessible), and *SRI*, 511 F.3d at 1196 (noting the similarity between “only one non-SRI person” having access to a reference and “the knowledge of the thesis’s availability by the three professors in *Bayer*”). *See Infobridge*, 929 F.3d at 1371–72 (discussing *SRI* and *Bayer* as instructive to the issue of accessibility).

Contrary to the situation here where an intent to make all the JCT-VC documents public existed, no reason existed for members of the thesis

committee in *Bayer* or the review committee in *SRI* to make the relevant documents public or even mention them outside of the respective committees. For example, in *Bayer*, “appellant’s thesis could have been located in the university library only by one having been informed of its existence by the faculty committee”—i.e., implying a lack of intent to publicize the existence of the thesis by the faculty committee. *See Bayer*, 511 F.3d at 1361. In *SRI*, “the prepublication Live Traffic paper, though on the FTP server, was not catalogued or indexed in a meaningful way and *not intended for dissemination to the public*,” and “the peer-review feature also suggests *no intent to publicize*.” *SRI*, 511 F.3d at 1197 (emphases added).

On the other hand, as the court in *SRI* noted, “[i]n *Klopfenstein*, two professional conferences displayed posters. These posters were printed publications *because their entire purpose was public communication of the relevant information*. *SRI*, 511 F.3d at 1196 (citing *Klopfenstein*, 380 F.3d at 1347–50); *see also Wyer*, 665 F.2d at 227 (“While intent to make public, activity in disseminating information, production of a certain number of copies, and production by a method allowing production of a large number of copies may aid in determining whether an item may be termed a ‘printed publication,’ they are neither always conclusive nor requisite.”).

Here, the JCT-VC server served as a repository of the category of HEVC documents. Ex. 1016, 2 (specifying listing “a single document registry and an electronic archive,” “all documents and contributions will be in electronic form,” and “all input and output documents of the JCT will be public”). Also, as Mr. Bross notes, Exhibit 1070 represents “one of the most influential technical journals in the video coding field in the 2010–2011

timeframe (and even later)” and the IEEE published a “Special Section on the Joint Call for Proposals on High Efficiency Video Coding (HEVC) Standardization.” Ex. 1068 ¶ 12 (quoting title, Ex. 1070, 3). The authors, JCT-VC contributors, cited the first meeting report, showing the intent to make documents public, as announced by the general policy. See Ex. 1016, 2. As noted above, this Special Section, in an influential trade journal, specifically discussed how video standards result in an explosion of products, introduced the premier video organizations joining forces to form JCT-VC, discussed the JCT-VC first meeting, its purpose (to publish new HEVC standards), and cited the first meeting report (Ex. 1028), which in turn describes the reflector “to be used for discussions by the JCT-VC” (*id.* at 2), and describes how to subscribe to it. Exhibit 1070, like Exhibit 1020 (ISO standards foster world-wide products), further shows that the JCT-VC involved a standards group that sought to reach the public to standardize commercial products.

In *Infobridge*, the court stated “we are reluctant to assume that an email among potential collaborators should be treated the same as a public disclosure without clear findings by the Board.” *Infobridge*, 929 F.3d at 1375. Here, as indicated above, Mr. Bross and the JCT-VC placed no restriction on further dissemination of the email or any documents at issue here, any interested member of the public could have jointed the listserv, and any interested member of the public would have had access to, and been able to find, WD3-v1 and Sole, after exercising reasonable diligence. Mr. Bross’s email announced the availability of WD3-v1, so that interested artisans subscribing to the email would have been able to notify their

respective institutions and colleagues about this important HEVC standards development simply by forwarding the email. *See* Ex. 1016, 1; Ex. 1020, 1; Ex. 1070, 3; Ex. 1002 ¶ 206; Ex. 1050 ¶ 23; Ex. 1058 ¶ 10–13; Ex. 1031, 1 (“The JCT-VC produced three particularly important output documents from the meeting,” including “the HEVC specification Working Draft 3 (WD3).”); *see also Infobridge*, 929 F.3d at 1374–75 (“Rather than requiring Samsung to prove that persons of ordinary skill actually received the listserv email, the Board should have considered whether Samsung’s evidence established that an ordinarily skilled artisan could have accessed the WD4 reference, after exercising reasonable diligence, based on the listserv email. This might include examining whether a person of ordinary skill, exercising reasonable diligence, would have joined the listserv. *See, e.g., GoPro*, 908 F.3d at 694. It also might include considering the circumstances of the email itself, for example why the email was sent and whether it was covered by an expectation of confidentiality.”)

The present situation parallels aspects of the situation in *Kyocera Wireless Corp. v. Int’l Trade Com’n*, 545 F.3d 1340, 1351 (Fed. Cir. 2008), which involved a GSM standards publication, wherein the court noted “the primary purpose of the GSM standard was to develop a system interoperable across national borders. This purpose made it crucial to grant access to any interested parties.” *See id.* at 1350–51 (standard documents, drafted within technical subcommittees of a standards drafting organization which did not impose restrictions on members, were sufficiently accessible to the public interested in the art to be considered publicly available).

Based on the listserv evidence and other evidence noted, Petitioner shows by a preponderance of evidence, including the testimony of Dr. Vetro and Mr. Bross and other corroborating evidence, that companies, universities, and other institutions sent representatives to the JCT-VC to promulgate and track world-wide standards, so that companies and individuals could comply with the new HEVC standards, and JCT-VC published standards documents without any restrictions as to further dissemination, making the standards documents accessible to interested artisans outside of the JCT-VC. *See* Pet. 17; Ex. 1002 ¶¶ 202–206; Ex. 1050 ¶ 23; Ex. 1058 ¶¶ 10–13; Ex. 1080; Ex. 1016; Ex. 1020. The well-known desire to conform emerging products to world-wide ISO standards generated by “[e]xperts from all over the world” to “help companies to access new markets” (*see* Ex. 1020, 1), coupled with evidence showing an intent to make the documents public with no expectation of confidentiality (Ex. 1016, 2), evidence regarding some routine search functionality, and evidence of discussion of the documents during meetings, shows public availability to members of the relevant public including artisans of ordinary skill interested in the subject matter of high efficiency video coding.

Having reviewed Patent Owner’s remaining arguments and supporting evidence, in light of the record as summarized above, we determine that Petitioner shows by a preponderance of evidence, that WD3-v1 and Sole were publicly accessible so that persons interested and ordinarily skilled in the art of video coding, exercising reasonable diligence, should have been able to locate them. Therefore, Petitioner shows persuasively that WD3-v1 and Sole constitute prior art printed publications under 35 U.S.C. § 102(a).

4. Overview of Budagavi

Budagavi discloses a method and apparatus for video encoding including video coding in the intra prediction mode. See Ex. 1005, Title, Abstract ¶¶ 4, 19–39, Figs. 1, 2, 4. Budagavi’s encoding scheme “may perform encoding . . . in accordance with one or more video compression standards such as . . . H.264 [and] ITU-T/ISO High Efficiency Video Coding (HEVC) standard.” See *id.* ¶ 24. Budagavi describes the encoding method/apparatus with reference to Figure 2, reproduced below:

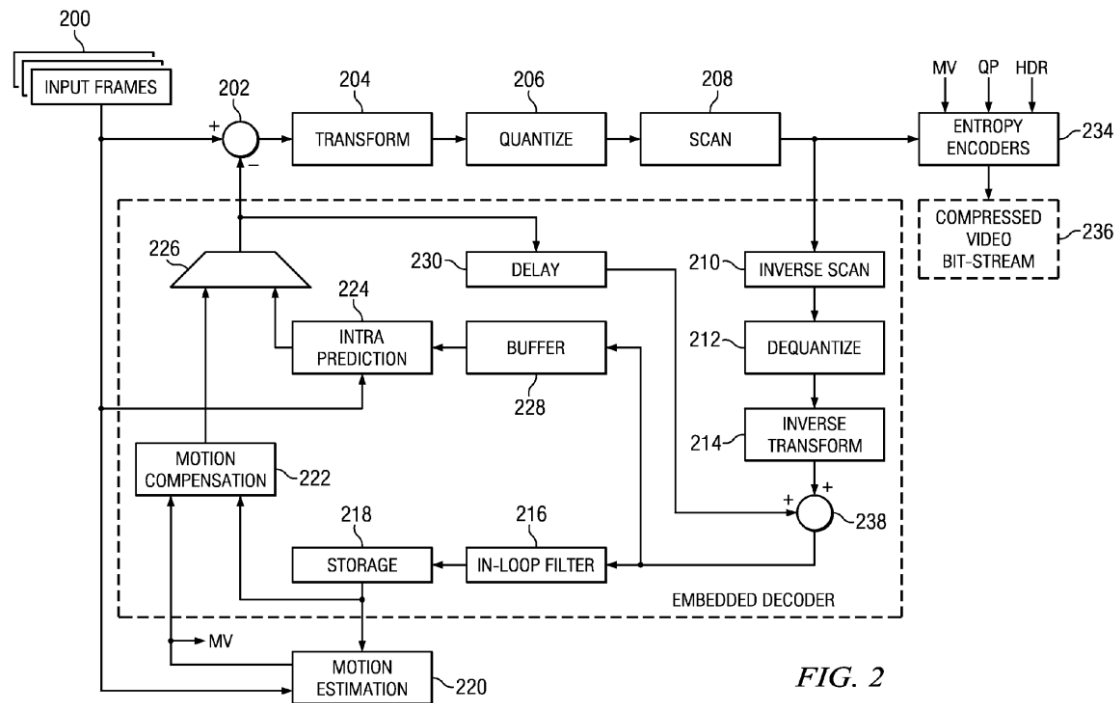


Figure 2 represents Budagavi’s encoder and embedded decoder, with intra prediction component 224, and transform units 204, 206, and 208, which provide block operations on residual prediction blocks from subtractor 202. See *id.* ¶¶ 28–29, 38. “Although not specifically shown, the

spatial prediction mode of each intra prediction block provided to the selector switch (226) is also provided to the transform component (204).”

Id. ¶ 28.

The encoding process creates residual blocks of differences:

The combiner (202) subtracts the predicted prediction block from the current prediction block of the current coding block to provide a residual prediction block to the transform component (204). The resulting residual prediction block is a set of pixel different values that quantify differences between pixel values of the original prediction block and the predicted prediction block.

Id. ¶ 28.

Combiner 238 “adds the delayed selected prediction block to the reconstructed residual prediction block to generate an unfiltered reconstructed prediction block, which becomes part of the reconstructed frame information.” *Id.* ¶ 39. Afterwards, filter component 216 “filters the reconstructed frame information and provides filtered reconstructed coding blocks, i.e., reference data, to storage component (218).” *Id.*

5. Overview of WD3-v1

WD3-v1, a JCT-VC output document, describes standards regarding an intra prediction mode using HVEC. *See* Ex. 1007, 1¹⁹; Ex. 1002 ¶¶ 54–55. According to Mr. Bross, WD3-v1 discloses

determining a scan pattern for quantized transform coefficients based on an intra prediction mode. (*See* Ex. 1007 at 112–113 (“8.5.2 Inverse scanning process for transform coefficients”).) Specifically, Table 8-11 shows that given a transform unit size (nS), a scan pattern (scanType) for quantized transform

¹⁹ We cite the exhibit page numbers added by Petitioner.

coefficients is determined by an intra prediction mode (IntraPredMode). (See *id.* at 111–113 (“8.5.1 Scaling and transformation process”—“8.5.2 Inverse scanning process for transform coefficients”, Table 8-11).)

Ex. 1002 ¶ 55.

WD3-v1 also discloses a vertical intra prediction mode, namely IntraPredMode 0. Ex. 1007, 111–13, Table 8-11; Ex. 1002 ¶ 55. In that mode, when the size of the transform block is four or eight, scanType 1 represents a horizontal scan pattern. Ex. 1007, 82 (“8.3.1 Derivation process for luma intra prediction mode,” Fig. 8-1) (showing 0 as a vertical scan, 1 as a horizontal scan), 85 (“8.3.3.1 Intra sample prediction”, Table 8-4) (same), 112–13 (“8.5.2 Inverse scanning process for transform coefficients”, Table 8-11) (showing scan type 1 for current transform size 4 and 8); Ex. 1002 ¶ 56. IntraPredMode 1 represents a horizontal intra prediction mode, and in that mode, with the size of the transform block (nS) either four or eight, the scan pattern 2 (scanType 2) represents a vertical scan pattern. See Ex. 1007, 82, 85, 112–13; Ex. 1002 ¶ 56.

6. Overview of Sole

Sole, a JCT-VC input document, discloses a process of scanning 4×4 subsets of 8×8 blocks in a high efficiency coding scheme applied to transforms. Ex. 1006, Abstract, 1–3, Fig. 2. “The scanning for the significance map is a forward zig-zag, horizontal or vertical pattern (depending on the prediction mode).” *Id.* at 1. Sole describes a desire to “simplify the scanning processes . . . without impacting coding efficiency much.” *Id.* at 2. Sole simplifies the process in part by applying the same scan to the significance map and the coefficient coding level and also by

applying the method for all block sizes. *See id.* at 2–3.

Claims 1–3, Alleged Obviousness, Budagavi and Sole

The preamble of claim 1 recites “[a]n image encoding method, comprising.” Petitioner persuasively reads the preamble on several disclosures in Budagavi, including “[a] method of intra-coding blocks of pixels in a digital video sequence.” Pet. 22–23 (quoting Ex. 1005, Abstract). Patent Owner does not dispute that Budagavi discloses or teaches the preamble.

After the preamble [a], listed steps [b] and [c] of claim 1 recite “determining, by an intra predictor, an intra prediction mode for image or video data” and “generating, by the intra predictor, a prediction block according to the intra prediction mode.”²⁰ Petitioner persuasively reads these steps onto the processes performed by the intra predictor component 224 depicted in Figure 2 of Budagavi (*see supra* Section II.B.2), which produces a spatial intra prediction mode. *See* Pet. 23–26 (annotating Ex. 1005, Fig. 2; citing Ex. 1002 ¶ 72). Petitioner quotes Budagavi as teaching the determination of a prediction mode as follows:

[T]he intra prediction component (224) performs spatial prediction in which tests based on multiple spatial prediction modes are performed on the coding block using previously encoded neighboring blocks of the frame from the buffer (228) to **choose the best spatial prediction mode for generating an intraprediction block** based on a coding cost.

²⁰ As noted *supra*, reference letters have been added to the limitations of claim 1 to track Petitioner’s nomenclature.

Id. at 24–25 (quoting Ex. 1005 ¶ 28) (emphasis by Petitioner). Based on the above summary and review of the record, Petitioner persuasively shows that Budagvai teaches steps [b] and [c]. Patent Owner does not dispute that Budagvai discloses or teaches steps [b] and [c].

Listed step [d] recites “transforming and quantizing, by a transform/quantization unit, a residual block of the prediction block to generate a quantized block.” Petitioner persuasively reads this step on the processes performed by Budagvai’s transform component 204 and quantization component 206. *Id.* at 26 (citing Ex. 1005 ¶¶ 30, 37; Ex. 1002 ¶¶ 83–95). To support its showing, Petitioner quotes Budagvai as follows:

Budagvai explains that “[t]he transform component (204) **performs a block transform on the residual prediction blocks** to convert the residual pixel values **to transform coefficients** and outputs the transform coefficients” and that “[t]he transform coefficients from the transform component (204) are provided to a **quantization component (206) which outputs quantized transform coefficients.**”

Id. (quoting Ex. 1005 ¶¶ 30, 37) (emphasis by Petitioner).

Claim 1 does not require a single “transform/quantization unit.” Even if it does, and even though Budagvai displays separate transform and quantization components 204 and 206, Petitioner persuasively shows that combining the two components into a single unit to perform block transform and quantization processes would have been obvious in order to render the process more efficient with fewer resources. *See id.* at 29–30 (citing Ex. 1002 ¶ 90). Petitioner explains the known options of combining or separating the components would have provided the same or similar information in block form, to be used for successive block operations, such

as by scan component 208. *See id.* (citing Ex. 1005 ¶¶ 37–38, Fig. 2; Ex. 1002 ¶ 91). Petitioner also cites to known combined transform and quantization units existing in the prior art before the date of the invention. *See id.* at 30–31 (citing Ex. 1010, Fig. 8; Ex. 1002 ¶ 94). Based on the above summary and review of the record, Petitioner persuasively shows that Budagvai teaches step [d]. Patent Owner does not dispute Petitioner’s showing regarding step [d].

Listed step [e] recites “inversely quantizing and inversely transforming, by an inverse quantization/transform unit, the quantized block to generate a restored residual block.” Petitioner persuasively shows that Budagavi discloses that dequantize component 212 and inverse transform component 214 perform this step. *Id.* at 31–40 (citing Ex. 1005 ¶¶ 37–38; Ex. 1002 ¶¶ 97–99.) Petitioner reiterates the argument that quantize unit 206 outputs the “quantized block” of the claim, and notes that the output of quantize unit 206 is scanned by scan component 208 but then inverse scan component 210 returns the quantized block to the “original post-transform arrangement.” *Id.* 32–34 (quoting Ex. 1005 ¶ 38). Petitioner persuasively shows that the output from the inverse scan component 210 would be the identical “quantized block.” Additionally, it would have been obvious to one of ordinary skill to modify Budagavi so that the quantized block output from quantization component 206 is input to the dequantize component 212 unaltered (without scan and inverse scan). *Id.* at 34–37 (citing Ex. 1002 ¶¶ 108–116).

Additionally, as with the transform/quantization unit of step [d], Petitioner persuasively shows that it would have been obvious to one of

ordinary skill at the time of the invention to combine the separate dequantize component 212 and inverse transform component 214 of Budagavi into a single unit to render the process more efficient with fewer resources. *See id.* at 38–40 (citing Ex. 1002 ¶ 118). Petitioner explains combining the components “would have enabled the same processes to be performed using less component resources and reduce transfer processing times.” *Id.* at 39 (citing Ex. 1002 ¶ 119). Petitioner also cites to known combined transform and quantization units existing in the prior art before the date of the invention. *See id.* at 39–40 (citing Ex. 1010, Fig. 8; Ex. 1002 ¶¶ 121–123). Patent Owner does not address Petitioner’s showing with respect to step [e].

Listed step [f] recites “entropy-coding, by an entropy coder, quantized coefficients of the quantized block.” Petitioner persuasively reads this step onto steps performed by Budagavi’s entropy encoder 234. *Id.* at 40 (citing Ex. 1005, Fig. 2, Abstract, ¶¶ 3, 37, 40, 46; Ex. 1002 ¶ 37).

With regard to limitation [g], we determined above that in the broadest reasonable interpretation of claim 1, the claimed method can be rendered obvious by a showing of the steps performed when the condition is not met. Thus, we do not review Petitioner’s contentions or Patent Owner’s arguments relating to this limitation. *See supra* Section II.C.2. As indicated above, Patent Owner presents no arguments directed to Petitioner’s analysis of other claim elements of claim 1, nor does Patent Owner challenge the motivation for combining Budagavi and Sole.

Claim 2 depends from claim 1 and adds the limitation that “the plurality of subsets are scanned in the reverse direction.” Petitioner refers

back to the analysis for element [g] of claim 1, and additionally cites Sole's disclosure that scanning of the subsets can occur in a reverse direction. *Id.* at 45–46, 52–53 (citing Ex. 1006, 1–5, Figs. 1, 2; Ex. 1002 ¶¶ 137, 152). The recited “subsets” receive antecedent basis from the “wherein clause.” Based on our claim construction of the “wherein” clause, it is not afforded patentable weight when the condition precedent is not met, so the further limitation of claim 2 also is not afforded patentable weight.

Claim 3 depends from claim 1 and adds the limitation that “the quantized coefficients of each subset are scanned in a reverse direction.” Petitioner similarly refers to the analysis for element [g] of claim 1, and specifically to Sole's disclosure that quantized coefficients of each subset may be scanned from the last significant to the first coefficient. *Id.* at 45–46, 53 (citing Ex. 1006, 1–5, Figs. 1, 2; Ex. 1002 ¶¶ 137, 153 (quoting Ex. 1006 at 3 (Section 2.1))). Based on our claim construction of the “wherein” clause, it is not afforded patentable weight when the condition precedent is not met, so the further limitation of claim 3, in which “each subset” receives its antecedent basis from the wherein clause, also is not afforded patentable weight.

Patent Owner does not separately argue any of the dependent claims (claims 2 and 3) included in this challenge. *See* PO Resp. 47.

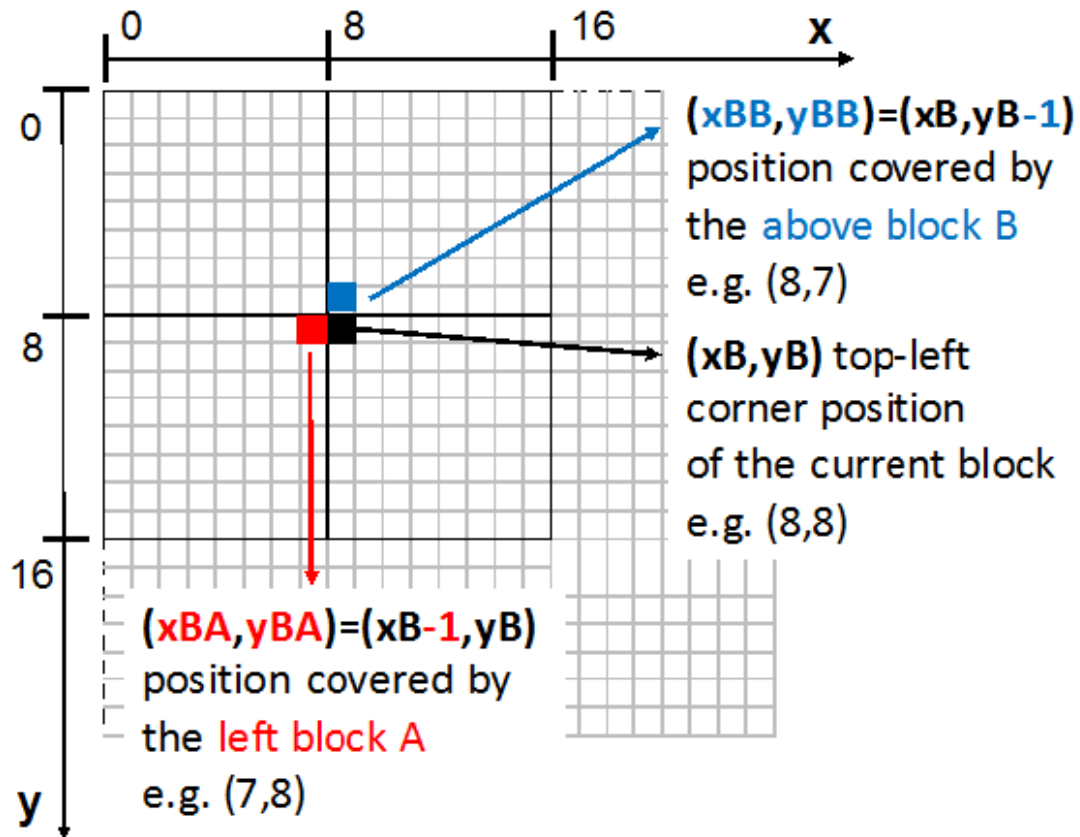
Accordingly, after reviewing the entire record, and for the foregoing reasons, we determine that Budagavi alone meets the elements of the challenged claims for the reasons advanced by Petitioner. We therefore determine that Petitioner has demonstrated by a preponderance of the evidence that claims 1–3 would have been obvious over Budagavi.

7. *Claims 4–7, Alleged Obviousness, Budagavi, Sole, and
WD3-v1*

Claim 4 depends from claim 1, with the additional limitation:

wherein the intra prediction mode is coded using an upper intra prediction mode and a left intra prediction mode, and when the upper intra prediction mode or the left intra prediction mode is unavailable, the upper intra prediction mode or the left intra prediction mode is set to a DC mode.

Petitioner persuasively relies on the teachings in WD3-v1 to address the added limitations of claim 4. For example, Petitioner points to upper and left blocks disclosed by WD3-v1 that allegedly pertain to the claimed “upper prediction mode” and “left intra prediction mode,” producing the following Demonstrative E for purposes of discussion:



DEMONSTRATIVE E

Pet. 56. Demonstrative E shows a position (8, 7) covered by the above block B above the position (8, 8) of block B (within a current block) and the position (7, 8) covered by left block A to the left of the position (8, 8) of block B. *See id.* (citing Ex. 1002 ¶¶ 158–160). Petitioner relates these three block/coding units generally to positions designated as positions (x_{BN}, y_{BN}) of arrays employed in intra prediction modes, depending on their availability, as allegedly disclosed in WD3-v1. *See id.* at 55–58.

Petitioner persuasively shows that an algorithm in WD3-v1 discloses “the intra prediction mode is coded using an upper intra prediction mode and a left intra prediction mode”:

Thus, the first and second sub-bullets [on page 83 of Ex. 1007 (subclause 8.3.1)] pertain to situations where the treeblock/coding unit to the left of or above the current block is not available. (*Id.*) The third sub-bullet describes where the intra prediction mode for the treeblock/coding unit to the left or the treeblock/coding unit above the current block is available. (*Id.*) Given the disclosures relating to the intraPredModeN being set equal to IntraPredMode[xBN][yBN], where IntraPredMode[xBN][yBN] represents the intra prediction mode of the treeblock/coding unit to the left and/or the intra prediction mode of the treeblock/coding unit above the current block, WD3-v1 discloses that the available left intra prediction mode and/or the available upper intra prediction mode are used to code the intra prediction mode.

Id. at 57–58 (citing Ex. 1002 ¶¶ 162–163).

According to Petitioner, Budagavi discloses performing tests on multiple spatial prediction modes using previously encoded frame blocks, in order to choose the best mode for generating an intra prediction block. *See id.* at 58–59 (citing Ex. 1005 ¶ 28). Petitioner persuasively shows that an artisan of ordinary skill would have looked to the teachings of WD3-v1 and Sole, in order to provide high efficiency encoding, to employ known standards, and/or enhance the method of Budagavi in a compatible fashion, because Budagavi applies and cites to H.264 and HEVC standard teachings, with Sole and WD3-v1 providing HEVC standards. *See id.* at 58 (citing Ex. 1005 ¶ 6, 24; Ex. 1002 ¶¶ 164–165). Petitioner persuasively contends

a POSITA would have appreciated that Sole and WD3-v1 relate to the same HEVC standard and JCT-VC working group and that Sole was a proposal for modifying/building upon the HEVC standard under development at that time, and that when a proposal is accepted by the working group, it became part of a working draft, such as WD3-v1.

Id. at 59 (citing Ex. 1002 ¶ 168; Ex. 1007, 1; Ex. 1006, 1; Ex. 1005, ¶¶ 6, 24, 28).

With regard to the “when” clause of claim 4, i.e., “when the upper intra prediction mode or the left intra prediction mode is unavailable, the upper intra prediction mode or the left intra prediction mode is set to a DC mode,” Petitioner persuasively shows the IntraPred Mode 2 described in WD3-v1 represents a DC mode. *Id.* at 55 (citing Ex. 1007 at 82 (subclause 8.3.1, Fig. 8-1), 85 (subclause 8.3.3.1, Table 8-4)). Petitioner asserts

a POSITA would have understood WD3-v1 describes that where it is determined that the coding unit to the left of the current block or the coding unit above the current block is not coded as intra prediction mode (and thus the intra prediction mode is not available for such coding unit(s)), the intra prediction mode of such coding unit(s) is set to a DC mode.

Id. (citing Ex. 1007, 81–83 (subclause 8.3.1); Ex. 1002 ¶ 133).

Patent Owner does not separately address claim 4. PO Resp. 72–73.

After reviewing the entire record, and for the foregoing reasons, we determine that Budagavi, Sole, and WD3-v1 teach or suggest the additional limitations of claim 4 and that Petitioner has demonstrated by a preponderance of the evidence that claim 4 would have been obvious over Budagavi, Sole, and WD3-v1.

Claims 5 and 6 depend from claim 1, with claim 5 adding “wherein when the intra prediction mode is a vertical mode, the scan pattern is a horizontal scan,” and claim 6 adding “wherein when the intra prediction mode is a horizontal mode, the scan pattern is a vertical scan.”

Petitioner persuasively shows how the teachings in WD3-v1 address

the added limitations of claims 5 and 6. Petitioner reproduces Table 8-4 of WD3-v1, as follows:

Table 8-4 – Specification of intraPredMode and associated names

intraPredMode	Name of intraPredMode
0	Intra_Vertical
1	Intra_Horizontal
2	Intra_DC
Otherwise (3..33)	Intra_Angular

Pet. 62 (reproducing Ex. 1007, 85 (Table 8-4)). According to Table 8-4, IntraPredMode 0 represents a vertical intra prediction mode, IntraPredMode 1 represents a horizontal intra prediction mode, IntraPredMode 2 represents a DC mode, and IntraPredMode 3 represents a diagonal mode. *See* Ex. 1007, 82, 85, 88–90; Pet. 61–62 (citing Ex. 1002 ¶ 171).

Petitioner cites Figure 8-1 of WD3-v1, which ties a specific IntraPredMode to the scan direction, and is illustrated below:

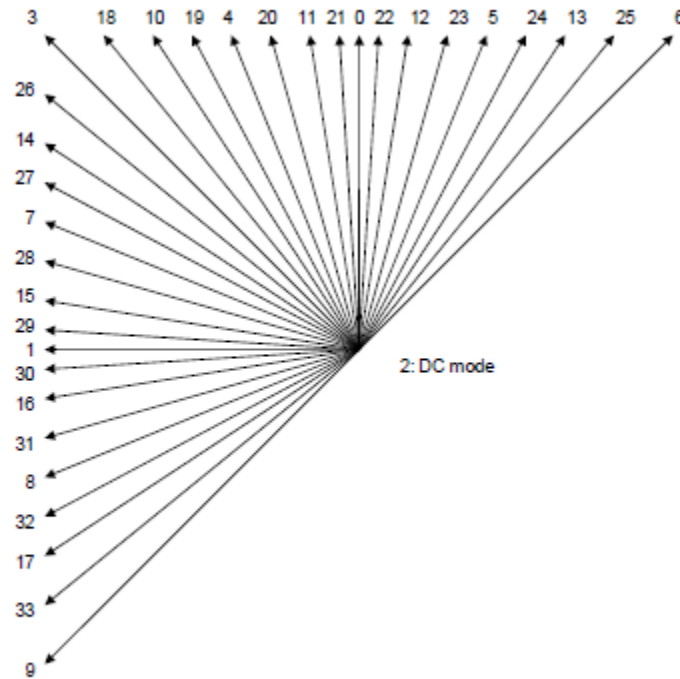


Figure 8-1 – Intra prediction mode directions (informative)

As Figure 8-1 above indicates, IntraPredMode 1 specifies a horizontal scan (see arrow designated as 1) direction and IntraPredMode 0 specifies a vertical scan direction (see arrow designated as 0). See Ex. 1007, 82.

According to Petitioner, WD3-v1 “discloses that when IntraPredMode is 0 (**vertical intra prediction mode**), the scan pattern (scanType) is 1 (**horizontal scan**)”, as recited in claim 5. *Id.* at 62 (citing Ex. 1007, 82 (Fig. 8-1), 85 (Table 8-4), 112–13 (Table 8-11); Ex. 1002 ¶¶ 174–175). On the other hand, “when IntraPredMode is 1 (horizontal intra prediction mode), the scan pattern (scanType) is 2 (vertical scan),” as recited in claim 6. *Id.* at 65 (citing Ex. 1007, 112 (Table 8-11)); Ex. 1002 ¶¶ 181–182); Ex. 1007, 82 (Fig. 8-1).

Similar to its showing regarding reasons to combine with respect to claim 4, Petitioner persuasively argues an artisan of ordinary skill would

have looked to the intra prediction scan pattern teachings of WD3-v1, in order to provide high efficiency encoding, to employ known standards, and/or to enhance the method of Budagavi in a compatible fashion, because, *inter alia*, Budagavi applies and cites to H.264 and HEVC standard teachings, with Sole and WD3-v1 providing HEVC standards. *See* Pet. at 62–65. Patent Owner does not present separate arguments for claims 5 or 6. PO Resp. 72–73.

After reviewing the entire record, and for the foregoing reasons, we determine that Budagavi, Sole, and WD3-v1 teach or suggest the additional limitations of claims 5 and 6 and that Petitioner has demonstrated by a preponderance of the evidence that claims 5 and 6 would have been obvious over Budagavi, Sole, and WD3-v1.

Claim 7 recites “[t]he method of claim 1, further comprising generating, by the intra predictor, reference pixels when unavailable reference pixels exist.” Petitioner relies on the combination of Budagavi, Sole, and WD3-v1 as suggesting the features of claim 7. *See id.* at 65–71. Petitioner persuasively shows the combination of Budagavi, Sole, and WD3-v1 suggests using reference pixels in the event the pixels would be unavailable for intra prediction. *See id.* at 66–67 (citing Ex. 1007, 84–85; Ex. 1002 ¶¶ 186–188; Ex. 1011). In general, WD3-v1 describes certain algorithmic conditions (e.g., when a neighboring reference sample would exist outside and above-right or below-left of a prediction block top right pixel) that defines a reference pixel as unavailable, and then the algorithm generates other reference pixels to replace them. *See* Ex. 1007, 84–85; Ex. 1002 ¶¶ 189–191 (Demonstrative F); Ex. 1011; Pet. 65–69.

Petitioner summarizes teachings in Budagavi and WD3-v1 as follows:

A POSITA would have appreciated and considered that *Budagavi*'s method would have been compatible with the approach where the Above-Right Pixels and the Below-Left Pixels [as disclosed in WD3-v1] are treated as reference pixels because *Budagavi* discloses the use of "surrounding pixels in the same frame" for intra prediction and the use of information pertaining to neighboring blocks for performing intra prediction.

Pet. 69 (citing Ex. 1005 ¶¶ 4, 28; Ex. 1002 ¶ 194).

Petitioner persuasively shows reasons for combining the references, including the similarity and compatibility of the reference teachings, and "to provide a more versatile and robust video encoding process involving the use of reference pixels." *Id.* at 69–70. Petitioner also relies on similar reasons advanced with respect to claims 4–6, including to provide efficient coding and to implement known techniques as standards or potential standards. *See id.* at 70 (citing Ex. 1002 ¶ 196). Patent Owner does not separately argue claim 7. PO Resp. 72–73.

After reviewing the entire record, and for the foregoing reasons, we determine that Budagavi, Sole, and WD3-v1 teach or suggest the additional limitations of claim 4 and that Petitioner has demonstrated by a preponderance of the evidence that claim 4 would have been obvious over Budagavi, Sole, and WD3-v1.

III. MOTION TO AMEND

Patent Owner's Motion to Amend proposes new claims 8–14 as substitutes for claims 1–7. Mot. Amend 1. The amendment is contingent on the outcome of the IPR as to the original claims. *Id.*

Proposed claim 8 is reproduced below with double bracketing to

indicate deletions from, and underlining to indicate additions to, claim 1 of the issued '673 patent.:

8. An image encoding method, comprising:
 - determining, by an intra predictor, an intra prediction mode for image or video data;
 - generating, by the intra predictor, a prediction block according to the intra prediction mode;
 - transforming and quantizing, by a transform/quantization unit, a residual block of the prediction block to generate a quantized block;
 - inversely quantizing and inversely transforming, by an inverse quantization/transform unit, the quantized block to generate a restored residual block; and
 - entropy-coding, by an entropy coder, quantized coefficients of the quantized block,wherein, [[when a size of the quantized block is equal to 8×8,]] the quantized coefficients of the quantized block having a size equal to 8×8 are divided into a plurality of subsets, and the quantized coefficients of each subset and the plurality of subsets are scanned according to a scan pattern determined by the intra prediction mode.

Id. at 5–7. Claim 8, proposed as a substitute for claim 1, is the only claim that would be substantively amended; the other claims would be amended only to change their dependency from claim 1 to new claim 8. *Id.* at 7–8.

A. Patent Owner’s Motion to Amend – Statutory Requirements

In an *inter partes* review, amended claims are not added to a patent as of right, but rather must be proposed as a part of a motion to amend. 35 U.S.C. § 316(d). The Board must assess the patentability of proposed substitute claims “without placing the burden of persuasion on the patent owner.” *Aqua Prods., Inc. v. Matal*, 872 F.3d 1290, 1328 (Fed. Cir. 2017)

(en banc). However, Patent Owner’s proposed substitute claims must meet the statutory requirements of 35 U.S.C. § 316(d) and the procedural requirements of 37 C.F.R. § 42.121. *See Lectrosonics, Inc. v. Zaxcom, Inc.*, IPR2018-01129, Paper 15 at 2 (PTAB Feb. 25, 2019) (precedential); “Guidance on Motions to Amend in view of Aqua Products” (Nov. 21, 2017) (https://www.uspto.gov/sites/default/files/documents/guidance_on_motions_to_amend_11_2017.pdf) (“Guidance”).

Accordingly, Patent Owner must demonstrate (1) the amendment responds to a ground of unpatentability involved in the trial; (2) the amendment does not seek to enlarge the scope of the claims of the patent or introduce new subject matter; (3) the amendment proposes a reasonable number of substitute claims; and (4) the proposed claims are supported in the original disclosure. *See* 35 U.S.C. § 316(d); 37 C.F.R. § 42.121(a), (b).

1. Responsiveness to a ground of unpatentability involved in the trial

Petitioner argues that the proposed amendment does not respond to a ground of unpatentability involved in the trial. Opp. Mot. Amend 3–4. Petitioner argues that the Motion to Amend seeks to address the conditionality of limitation [g] and that prior to filing the Motion to Amend, neither Petitioner nor the Board raised this issue. *Id.* at 4. In the Motion to Amend, Patent Owner states:

While neither the Petitioner nor the Board has raised this conditionality issue, out of an abundance of caution, Patent Owner submits substitute claims 8–14 to the extent this issue is raised and the Board finds that the ‘wherein’ clause is conditional and non-limiting. That is, if the issue of conditionality regarding

claim 1's 'wherein' clause is ultimately raised during this trial with respect to asserted Ground 1 and found to be non-limiting, this motion to amend responds to and overcomes it.

Mot. Amend 9.

By challenging claim 1 in the Petition, the Petition raises the issue of the scope of the wherein clause, including whether and how it reads on the prior art of record. We have an "independent obligation to determine the meaning of the claims." *See Exxon Chem. Patents, Inc. v. Lubrizol Corp.*, 64 F.3d 1553, 1555–58 (Fed. Cir. 1995) ("[T]he [court] has an independent obligation to determine the meaning of the claims, notwithstanding the views asserted by the adversary parties.").

Upon a review of "the entirety of the record" we determine that the amendments are "responsive to a ground of unpatentability involved in the trial." *Lectrosonics*, IPR2018-01129, Paper 15 at 5; *see also Google Inc. v. ContentGuard Holdings, Inc.*, CBM2015-00040, Paper 48 at 62–63 (PTAB Feb. 19, 2019) (finding that an amendment addressing a claim construction issue which "makes explicit what Petitioners contend is already implicit in [the claim]" is responsive to patentability issues involved in the trial).

2. *Change in scope of the claims of the patent; new matter*

Petitioner argues that the proposed amendments do not change the scope of the claims, and cites "[Patent Owner's admission] that the proposed substitute claims would be narrower than the original claims only if the Board determines that the 'wherein' clause of claim 1 is conditional and non-limiting." Opp. Mot. Amend 1–3. Petitioner concludes that such narrowing would not be responsive to the grounds of unpatentability involved in the trial, which we have addressed *supra*.

Patent Owner contends that “[i]f the ‘wherein’ clause is found to be conditional and non-limiting, the substitute claims, which positively recite the size limitation of the quantized block, would be narrower than the presently challenged claims.” Mot. Amend 4. We determined above that limitation [g] of claim 1 is conditional and not subject to patentable weight, and we agree with Patent Owner’s un rebutted statements regarding the amended claims being of narrower claim scope in light of our determination.

Patent Owner presents a persuasive showing that no new matter has been introduced. *Id.* at 4–9. Petitioner’s argument that “the proposed amendments do not change the scope of the claims” is consistent with this determination. *See* Opp. Mot. Amend 2.

3. *Reasonable number of substitute claims; support in the disclosure*

Petitioner does not argue that Patent Owner’s proposed amendments are unreasonable in number or lack support in the disclosure. Patent Owner presents one substitute claim per challenged claim, which is reasonable. *See* 37 C.F.R. § 42.121(a)(3). Patent Owner discusses the support in the disclosure, and we agree that such support has been shown. *See* Mot. Amend 4–9.

4. *Conclusion – Statutory and Regulatory Requirements*

We determine that Patent Owner has satisfied the predicate requirements to considering a motion to amend. *See* 35 U.S.C. § 316(d); 37 C.F.R § 42.121.

B. *Petitioner Has Not Shown Claims 8–14 are Unpatentable*

Petitioner argues that the substitute claims are unpatentable over the prior art for the reasons set forth in the Petition, accompanying exhibits, the

Board's Decision on Institution, and the Petitioner's Reply to Patent Owner's Response. Opp. Mot. Amend 5–11. With respect to proposed claim 8's added requirement that the quantized block have a size equal to 8×8 , Petitioner argues that both Budagavi and Sole teach an 8×8 quantized block having quantized coefficients. *Id.* at 6–8 (citing Pet. 40–43; Ex. 1002 ¶¶ 127–133).

1. *Patentability of Claim 8*

Petitioner challenges the patentability of Claim 8 under 35 U.S.C. § 103(a) as obvious over Budagavi and Sole. All but the final limitation of claim 8 is unchanged from claim 1. Petitioner relies on its arguments relating to claim 1, discussed for limitations [a] through [f] of claim 1 in Section II.D.5. *See* Opp. Mot. Amend 5–6.

With respect to proposed claim 8's added requirement that the quantized block have a size equal to 8×8 , Petitioner argues that both Budagavi and Sole teach an 8×8 quantized block having quantized coefficients. *Id.* at 6–8 (citing Pet. 40–43; Ex. 1002 ¶¶ 127–133). Otherwise, Petitioner relies in the Petition on the analysis relating to other aspects of limitation [g] of claim 1. *Id.* at 9–10.

For limitation [g] of claim 1, and thus for the corresponding limitation of claim 8, Petitioner contends Budagavi discloses 8×8 transform matrices applied to a residual block to obtain an 8×8 transform block with transform coefficients. Pet. 40–42 (citing Ex. 1002 ¶¶ 127–129; Ex. 1005 ¶¶ 5, 30–33, 44–51, Fig. 4). As an example, Budagavi states “[t]he same DCT matrix is used for all prediction modes of the same block size. For example, for 4×4 prediction modes, a 4×4 DCT matrix is used and for 8×8 prediction modes,

an 8×8 DCT matrix is used.” Ex. 1005 ¶ 18 (cited at Pet. 41–42).

According to Mr. Bross, “because a block transform or a transform matrix is applied to a residual block to obtain a transform block, a POSITA would have understood that the size of the block transform or the size of the transform matrix determines the size of the resulting transform block.”

Ex. 1002 ¶ 131 (citing Ex. 1005 ¶¶ 5, 30, 31, 33, 41–51, Fig. 4).

According to Petitioner, Budagavi does not disclose explicitly dividing the quantized coefficients of the quantized block into a plurality of subsets, and scanning according to a scan pattern determined by the intra prediction mode, but the combination of Budagavi and Sole suggests the feature. *See* Pet. 42.

Regarding the recitation that “the quantized coefficients of the quantized block are divided into a plurality of subsets,” according to Petitioner, Sole discloses this in the division of the coefficient scan into 4×4 sub-blocks of coefficients. *Id.* at 42–43 (citing Ex. 1006, 3 (Section 2.1), Figs. 2, 3). Thus, Petitioner argues, one of ordinary skill in the art would have understood that for a quantized block of size 8×8 (i.e. larger than 4×4), this would have entailed dividing the coefficients into a plurality of subsets.

Regarding the recitation that “the quantized coefficients of each subset and the plurality of subsets are scanned according to a scan pattern determined by the intra-prediction mode,” Petitioner argues that Figure 2 of Sole discloses scanning the quantized coefficients of each subset and the plurality of subsets according to a zig-zag scan pattern. *Id.* at 42–44.

Petitioner reproduces Sole’s Figure 2, which follows:

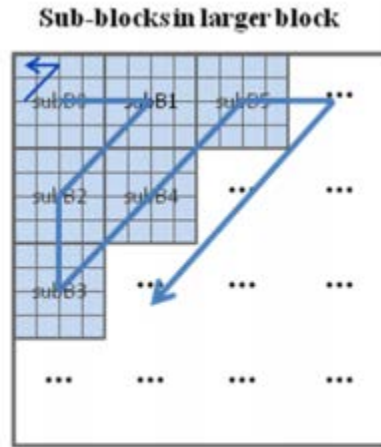


Figure 2-Scanning order for level coding

Pet. 44. Figure 2 of Sole represents scanning within sub-blocks (dark blue arrow) and scanning within a larger block (lighter blue), with Sole referring to the scan as a “forward-backward zig zag scan” (Ex. 1006, 1, Fig. 2). See Pet. 44–46 & n.14 (forward across subsets, backward within subsets).

Petitioner argues that Sole discloses using a scan for the significance map with a scan pattern (horizontal, vertical, or zig-zag) determined by the prediction mode. *Id.* at 46 (citing Ex. 1006, 1–2; Ex. 1002 ¶¶ 139–140). Petitioner argues that “Sole’s contribution is aimed at using the same scan pattern (e.g., horizontal, vertical or zigzag pattern) to scan both a plurality of subsets and the quantized coefficients of each subset. *Id.* at 48 (citing Ex. 1006, 1–5, Figs. 1, 2; Ex. 1002 ¶ 141). Thus, Petitioner argues, Sole discloses a scan pattern determined by the intra prediction mode that is used to scan the quantized coefficients of each subset and the plurality of subsets. *Id.*

With respect to the combination of Sole and Budagavi, Petitioner contends implementing Sole’s method, including dividing larger blocks (including 8×8 blocks) into 4×4 subsets, would have been obvious to ensure

an efficient and effective encoding process without departing significantly from Budagavi's encoding process, thereby implementing a predictable application of known techniques. *See id.* at 42–43, 49–52 (citing Ex. 1006, 1, 3, Figs. 2, 3; Ex. 1002 ¶¶ 133, 144–151).

Regarding the scanning according to a scan pattern portion of this limitation, Petitioner initially points out that Budagavi generally discloses “scanning the quantized coefficients by scan component (208).” *Id.* at 42 (citing Ex. 1005, ¶¶ 37–38, Fig. 2). In addition, Petitioner points to Budagavi's explanation “that ‘the quantized transform coefficients are **taken out of their raster-scan ordering** [by] a scan component (208) and **arranged** by significance,’ which Budagavi calls “ordered quantized transform coefficients.”” *Id.* at 49 (quoting Ex. 1005 ¶¶ 37–38) (emphasis and added information by Petitioner). Petitioner quotes Sole as disclosing “**scanning** for the significance map is a forward **zig-zag, horizontal or vertical** pattern (***depending on the prediction mode***).” *Id.* at 46–47 (quoting Ex. 1006, 1) (emphasis by Petitioner). Petitioner contends this teaching by Sole corresponds to, or at least suggests, tying scanning patterns to an intra prediction mode, given the two known types (intra and inter prediction) discussed by Sole. *See id.* (citing Ex. 1006, 1; Ex. 1002 ¶¶ 139–140; Ex. 1008).

Petitioner also contends Budagavi discloses selecting different block transforms and transform matrices in generating a transform block based on an intra (spatial) prediction mode used in generating a prediction block, and then the process orders the coefficients by significance thereafter, so that a skilled artisan would have recognized efficiency coding benefits in tying

scan patterns (e.g., to scan significant coefficients in order) to specific intra prediction modes. *See id.* at 50–52 (citing Ex. 1005 ¶¶ 3, 17, 18, 28, 37, 51, Figs. 6–7; Ex. 1002 ¶¶ 143–151). Petitioner contends tying Budagavi’s prediction modes to scan patterns as the claim 8 requires would have been “a foreseeable and sensible approach” to ensuring an efficient method, because an artisan of ordinary skill would have known that the distribution patterns of the transform coefficients may be affected by the spatial intra prediction mode employed. *See id.* at 51 (citing Ex. 1005 ¶¶ 30, 37; Ex. 1002 ¶¶ 147–148).

By suggesting different raster-scan ordering of transform coefficients and arranging the coefficients by significance, Petitioner also contends Budagavi points skilled artisans to related teachings for additional details regarding efficient scan patterns, including patterns taught in the context of efficient coding related to the H.264 and HEVC standards that Budagavi mentions. *See id.* at 49–50 (citing Ex. 1002 ¶¶ 145–146; Ex. 1005 ¶ 24; Ex. 1010, 14 (discussing zigzag scans)). Petitioner points out that Budagavi cites a document (regarding video coding transforms) and the same working group of the JCT-VC that produced Sole. *Id.* at 50 (citing Ex. 1005 ¶ 6; Ex. 1006, 1; Ex. 1002 ¶ 146 (mentioning the transforms)).

Patent Owner contends that the combined teachings of Sole and Budagavi do not teach or suggest the final “wherein” clause of claim 8, including dividing subsets of an 8×8 block, and scanning of subsets according to a scan pattern determined by the intra prediction mode. PO Resp. 48, 55–63; PO Sur-Reply 16–25. Rather, Patent Owner argues,

Petitioner improperly conflates disparate teachings of Sole. PO Sur-Reply 16–24.

Patent Owner contends that Sole describes the “HM2.0 design” as the “current high efficiency transform coefficient coding.” *Id.* at 16. In one implementation of this design, according to Patent Owner, Sole’s method performs significance map coding using a pattern which depends on the “prediction mode” (but not the intra prediction mode), as shown in Figure 1. *Id.* at 16–17, 21. Patent Owner argues that Sole contrasts this scanning to improve upon a method that involves scanning sub-blocks of quantized coefficients under a different implementation of HM2.0 that corresponds to Figure 2. *Id.* at 17–18; PO Resp. 55–56. To scan sub-blocks according to Figure 2, “each block is mapped onto an ordered set of 4×4 sub-blocks by using a forward zig-zag scan; while the transform coefficient levels inside a sub-block are processed in a backward zig-zag scan.” Ex. 1006, 1 (cited at PO Resp. 55–56; PO Sur-Reply 17).

Patent Owner also argues that Sole does not indicate that any other scan pattern may be used in Figure 2’s scan, other than the zig-zag scan illustrated. PO Resp. 56. Thus, Patent Owner argues, the scans of the quantized coefficients of each subset and the plurality of the subsets “are not determined by any prediction mode” in Sole. PO Sur-Reply 17–18.

Patent Owner argues that the differences between these two scan directions (i.e., the forward-backward scan illustrated in Sole’s Figure 2) motivated Sole to present a simplified scanning process. *Id.* at 18–19 (citing Ex. 1006, 2–3). Patent Owner adds that “Part 1” of Sole, in which Sole presents the idea of simplifying the coefficient scanning scheme and

proposes unifying the scans to use the zig-zag, horizontal, or vertical scheme of the significance map (Ex. 1006, 2–3), relates to the use of a single scan without any division of the coefficients into subsets. PO Resp. 48, 59–60; PO Sur-Reply 20 (citing Ex. 1006, 2). Patent Owner further argues that Sole’s proposed algorithm expressly implements a subset concept from Davies.²¹ PO Resp. 50–53, 61 (citing Ex. 1006, 2; Ex. 2028, 2).

Building on the arguments and cited evidence above, Patent Owner contends that Sole contrasts the “[c]urrent method in HM2.0” as shown in Sole Figure 2 with its Part 1 “proposed algorithm” which “keeps the sub-sets concept in a similar way as in [Davies]” in which “each sub-set consists of 16 consecutive coefficients in the scanning order.” Ex. 1006, 3 (quoted at PO Resp. 50–51 (also citing Ex. 2025 ¶ 81)). Davies supports Patent Owner by describing “a modification of high efficiency configuration coefficient coding” in which “a single deterministic scan pattern per block” is used that divides coefficients into “chunks” of 16 coefficients. Ex. 2028, 1–2. This “chunking” for a 16×16 block is shown in Figure 2-1, reproduced below:

²¹ Thomas Davies, Unified Scan Processing for High Efficiency Coefficient Coding, JCTVC-D219, 4th JCTVC Meeting, Daegu, KR (January, 2011) (Ex. 2028).



Figure 2-1. Chunking of 16x16 TU.

Id. at 2 (reproduced at PO Resp. 52, 62). Figure 2-1 shows a 16×16 square grid with colors indicating chunks — the first 16 scanned coefficients in a zig-zag pattern in red, the next 16 in blue, proceeding to the last 16 in the pattern shown in green. *Id.*; PO Resp. 51–52 (citing Ex. 2025 ¶ 82).

Patent Owner argues that Sole uses this single scan pattern of Davies to divide the quantized coefficients in Sole into a plurality of subsets or chunks after scanning, and thus Sole does not teach or suggest scanning “the quantized coefficients of each subset and the plurality of subsets,” as claim 8 requires. *See* PO Resp. 51–54. In other words, Patent Owner argues that Sole does not teach or suggest scanning subsets because scanning occurs prior to any subset formation in the algorithm pertaining to Sole’s Figure 1 (which relies on the subset formation of Davies). *See, e.g., id.* at 62 (“Davies does not disclose scanning the ‘chunks’ to re-order the already scanned coefficients. That is, the subsets are not scanned, let alone scanned using a scan pattern determined by the intra prediction.” (citing Ex. 2028, 2; Ex. 2025 ¶ 95)), 63 (“That is, once the coefficients [in Sole and Davies] are

scanned to form the one-dimensional array, the coefficients are merely further processed one ‘chunk’ at a time.” (citing Ex. 2028, 2; Ex. 2025 ¶ 95)); PO Reply Br. 21 (“**After** the 1D linear array [in Sole and Davies] is produced, it is partitioned into ‘subsets’ of 16 quantized coefficients in the order in which the quantized coefficients were scanned. **There is no step of scanning ‘subsets’** when the block is scanned (the block was never divided into subsets, and thus, subsets could not have been scanned).”).

Patent Owner also contends that the above arguments and cited evidence confirm that the re-use of the significance map scan for the quantized coefficients of a block in Sole does not teach or suggest scanning “the quantized coefficients of each subset and the plurality of subsets” “according to a scan pattern determined by the intra prediction mode” as claim 8 requires, contrary to Petitioner’s arguments. PO Resp. 50–53, 60–62; PO Sur-Reply 19–22.

As discussed above, Petitioner relies on the scanning of the sub-blocks (which it maps to the claimed plurality of subsets) and the transform coefficient levels in each sub-block (which it maps to the quantized coefficients of each subset) according to a scan pattern (the zig-zag pattern) as shown in Figure 2 of Sole. Pet. 43–45. Petitioner cites this teaching about Figure 2 in concert with the teaching relating to Sole’s proposed algorithm for Figure 1 that “[t]he scan is not forward-backward like the current [Figure 2] one [but i]nstead it only follows a backward direction,” to teach or suggest the claimed scanning of “the quantized coefficients of each subset and the plurality of subsets” “according to a scan pattern determined

by the intra prediction mode,” which the “wherein” clause requires. *Id.* at 45–46 (quoting Ex. 1006, 2–3).

In other words, Petitioner combines teachings related to Sole’s Figure 1, which teaches using a single scan depending on a prediction mode, with teachings related to Figure 2, which teaches scanning subsets in a different direction than scanning coefficients within a subset (without teaching the two scans depend on the intra prediction mode). *See* Ex. 1006, 1–2, Figs. 1 and 2; Opp. 8–9 (citing Pet. 43–49; Ex. 1002 ¶¶ 134–135). In so doing, Petitioner improperly combines two teachings from separate embodiments without an adequate reason. As the main reason for the combination, Petitioner contends that Sole combines the teachings from the two embodiments. *See* Pet. 45 (arguing “Sole also discloses using a backward zigzag scan for scanning the quantized coefficients of each subset and the plurality of subsets, *which is a modified version of the scan technique shown in Figure 2*” (emphasis added)), 45–51 (relying on what Sole allegedly teaches and explaining why an artisan of ordinary skill would have looked to Sole). Dr. Kalva credibly testifies that Sole does not teach combining the teachings. *See, e.g.,* Ex. 2025 ¶ 91 (“Sole repeatedly asserts that its aim is to apply the same scan pattern used for the significance map to the coefficient level coding (e.g., the quantized coefficients.)”), ¶ 94 (The conclusion that Sole does not teach or suggest scanning subsets using a scan pattern determined by the intra prediction mode is confirmed by Davies and Sole II.”), ¶ 95 (“[T]he subsets are not scanned, let alone scanned using a scan pattern determined by the intra prediction”).

Apart from relying on Sole, Petitioner also cites to Budagavi, explaining that “*Budagavi* discloses that different block transforms and transform matrices are selected in generating a transform block based on an intra (spatial) prediction mode that was used in generating a prediction block.” Pet. 43 (citing Ex. 1005 ¶ 30). Petitioner does not explain sufficiently why selecting different transform blocks based on an intra prediction mode lends a reason for why it would have been obvious to scan subsets based on an intra prediction mode, even if, as Petitioner states, “distribution patterns of quantized transform coefficients . . . *may be* affected by the intra (spatial) prediction mode used.” Pet. 43–44 (citing Ex. 1005 ¶ 30) (emphasis added).

Absent this alleged connection between scanning subsets and the intra prediction mode, Petitioner’s showing that relies primarily on the connection, does not provide sufficient rationale for the combination. *See* Opp. 8–9 (citing Pet. 43–49; Ex. 1002 ¶¶ 134–135); Reply 5–18.²² Dr. Kalva credibly testifies that Sole does not teach or suggest combining the

²² Mr. Bross cites to Zheng’s teachings (Ex. 1008) to the “knowledge” of one of ordinary skill reading Sole, so such a person would have recognized a “correlation between the intra prediction mode and the coefficient scanning.” Ex. 1002 ¶ 140 & n.42 (quoting Ex. 1008, 4) (emphasis omitted). But this only correlates the intra prediction mode to the prediction mode of Sole and its connection to scanning the significance map with respect to Figure 1, i.e., it does not suggest a connection between the intra prediction mode and scanning of subsets. Mr. Bross confirms this understanding: “Thus, a POSITA would have understood that *Sole* discloses that the scan pattern (e.g., horizontal, vertical or zigzag) for the significance map is determined by an intra prediction mode.” *Id.* ¶ 140.

teachings. *See, e.g.*, Ex. 2025 ¶ 91 (“Sole repeatedly asserts that its aim is to apply the same scan pattern used for the significance map to the coefficient level coding (e.g., the quantized coefficients.”), ¶ 94 (The conclusion that Sole does not teach or suggest scanning subsets using a scan pattern determined by the intra prediction mode is confirmed by Davies and Sole II.”), ¶ 95 (“[T]he subsets are not scanned, let alone scanned using a scan pattern determined by the intra prediction”).

Petitioner also does not address whether Davies involves the scanning of subsets. Opp. Mot. Amend 5–11 (relying on its Reply). Rather, Petitioner argues that Patent Owner improperly relies on Davies, and that Sole does not describe using the scanning method of Davies, but rather “[a]t best, [Sole] merely informs a reader that some concepts may be ‘similar’ to some concepts of Davies.” Reply 6–7 (quoting Ex. 1006, 3). Sole, however, as Patent Owner demonstrates, contrasts the “[c]urrent method in HM2.0 . . . where each sub-set is a 4×4 sub-block” with “[t]he proposed algorithm” in which “each sub-set consists of 16 consecutive coefficients in the scanning order.” Ex. 1006, 3.

Dr. Kalva testifies credibly that Davies’ method relates to sub-sets of coefficients being created in the scanning order (a zig-zag scan) after scanning the array or parts of the array. *See* Ex. 2025 ¶¶ 94–98 (discussing Ex. 2028, 2). Contrary to Petitioner’s argument that Sole keeps the HM2.0 4×4 subset concept with Sole’s proposed algorithm (*see* Reply 8–9), Sole states clearly that the proposed algorithm “keeps the sub-sets concept in a similar way as in [2]”—i.e., as in Davies. Ex. 1006, 3 (citing note “[2]”), 5 (listing Davies as note 2). So while Sole uses the sub-set concept of Davies

in Sole's proposed algorithm, Sole's disclosure that "each sub-set consists of 16 consecutive coefficients in the scanning order" further indicates that Sole does not use the sub-block concept from the HM2.0 method of Sole's Figure 2 (which illustrates scanning 4×4 sub-blocks formed prior to scanning).

Ex. 1006, 3.

In reaching this decision, we find that Dr. Kalva credibly relies on Davies to corroborate what Sole teaches. *See* Ex. 2025 ¶¶ 94–97 ("The conclusion that Sole does not teach or suggest scanning subsets using a scan pattern determined by the intra prediction mode is confirmed by Davies and Sole II."). On the other hand, Mr. Bross acknowledges that he did not recall investigating the teachings of Davies to aid in his further understanding of Sole. *See* PO Resp. 50 (alleging "Mr. Bross admitted he never reviewed Davies in preparing his declaration" (citing Ex. 2026, 91:4–92:16)); Reply 5 n.4 (arguing that Mr. Bross only responded that he did not remember such review (citing Ex. 2026, 91:4–92:7)).

Given this posture, Petitioner does not meet the burden of showing the method of Sole, implementing the chunking method of Davies, teaches or suggests the scanning of subsets according to an intra prediction mode. Dr. Kalva provides uncontradicted testimony that Davies does not involve the scanning of subsets. *See* Ex. 2025 ¶ 96 ("This single scan converts a block of coefficients (e.g., 16x16) into a one-dimensional array (e.g., 1x256 array). The one-dimensional array of coefficients *is then divided* into 'chunks' of 16 consecutively scanned coefficients for further processing" (emphasis added)), ¶ 95 ("the subsets are not scanned, let alone scanned using a scan pattern determined by the intra prediction"). Patent Owner also contends

“[a]s admitted by Mr. Bross, the scan for the significance map does not scan subsets.” PO Sur-Reply (citing Ex. 2034, 21:20–22:7). During his deposition, Mr. Bross states “in figure 1 [of Sole], I . . . cannot see subsets.” Ex. 2034, 22–67 (discussing Ex. 1006).

For the reasons discussed above, we determine that Sole’s proposed algorithm implements a single scan direction without suggesting retaining the sub-block concept and without suggesting scanning sub-blocks according to an intra prediction mode. Therefore, Sole does not teach scanning a plurality of subsets according to an intra prediction mode as claim 8 requires. Accordingly, Petitioner fails to meet the burden of showing that a person of ordinary skill would have considered the combined teachings of Budagavi and Sole to meet the last limitation of proposed substitute claim 8. After reviewing the entire record, we determine Petitioner has not shown that the subject matter of proposed substitute claim 8 would have been obvious over Budagavi and Sole. We therefore grant Patent Owner’s Motion to Amend as to proposed substitute claim 8.

2. Patentability of Claims 9–14

Because the parties do present not separate arguments for proposed substitute claims 9–14, which depend from proposed substitute claim 8, they stand with claim 8. Accordingly, we further grant Patent Owner’s Motion to Amend as to these proposed substitute dependent claims.

IV. MOTION TO EXCLUDE EVIDENCE

Patent Owner filed Motion to Exclude Evidence Pursuant to 37 C.F.R. § 42.64 (Paper 40, “Motion” or “Mot.”); Petitioner filed an Opposition to Patent Owner’s Motion to Exclude Evidence (Paper 45,

“Opposition” or “Opp.”); and Patent Owner filed a Reply in Support of its Motion to Exclude Evidence Pursuant to 37 C.F.R. § 42.64 (Paper 46, “Reply Motion” or “Reply Mot.”).

Patent Owner seeks to exclude certain testimony by Mr. Bross, namely paragraphs 10 and 11 of his Supplemental Declaration (Ex. 1068). Patent Owner’s Motion alleges the testimony constitutes inadmissible hearsay and lacks a proper foundation, as follows:

Mr. Bross, testifying as a fact witness, alleges that “persons experienced and skilled, and interested, in video coding technologies were tracking the developments of the latest video coding standard by regularly visiting the JCT-VC site to ensure that products and services they were developing were consistent with the HEVC Standard under development.” Ex 1068, ¶ 10.

The basis for this assertion is not first-hand knowledge as required under FRE 602, but inadmissible hearsay under FRE 801 and 802. Specifically, Mr. Bross alleges in paragraph 11 that “I know this to be true because I recall discussions with persons experienced in video coding in the 2011 timeframe about the HEVC Standard. . . [.]” Ex 1068, ¶ 11. Mr. Bross further alleges that he recalls interactions with representatives from Qualcomm and Broadcom. *Id.*, ¶ 11.

Mot. 2.

Petitioner contends the Motion must fail because Patent Owner’s objections lacked particularity. Opp. 2. According to Petitioner,

Patent Owner’s objection generally identified Exhibit 1068 (Mr. Bross’ eighteen page, twenty-three paragraph Supplemental Declaration) and consisted of a laundry list of objections to this exhibit. (Paper 23 at 1.) Such generalized objections are not sufficient to support Patent Owner’s specific objections to paragraphs 10 and 11 in its Motion (Motion at 2–3), as Petitioner did not have sufficient notice to cure the alleged deficiencies via supplemental evidence.

Opp. 2.

Under 37 C.F.R. § 42.64(b)(1) “[t]he objection must identify the grounds for the objection with sufficient particularity to allow correction in the form of supplemental evidence.” We agree with Petitioner that the objection does not identify the grounds with sufficient particularity. In any event, we need not reach the propriety of the form of the objection. As discussed below, the statements to be excluded do not constitute hearsay because the statements (1) are not offered for the truth of the matter asserted or (2) they fall under a hearsay exception. Also, regarding Federal Rule of Evidence 602 (“[e]vidence to prove personal knowledge may consist of the witness’s own testimony”), as Petitioner explains, Mr. Bross’s statements “provide[] the foundation for his belief that engineers and other individuals in major technology companies with experience in video coding, were tracking the developments of the HEVC standard and the Working Drafts on the JCT-VC site.” Opp. 6 (citing Fed. R. Evid. 801(c), 1997 Adv. Comm. Note.) (“[T]he significance of [those statements] lies solely in the fact that [they were] made.”).

At issue here, the public dissemination of documents, concerns what documents an interested artisan exercising reasonable diligence should have been able to locate “if they wanted to.” See *GoPro*, 908 F.3d at 693 (“[W]e explained that ‘[a]ccessibility goes to the issue of whether interested members of the relevant public could obtain the information if they wanted to’ and ‘[i]f accessibility is proved, there is no requirement to show that particular members of the public actually received the information.’” (quoting *Constant*, 848 F.2d at 1569)). Here, Mr. Bross’s testimony shows

that engineers knew about the JCT-VC web-site, and also, possessed the plan, motive, or intent to track and locate documents on the JCT-VC website, but none of their statements are being offered for the truth of the matter asserted, or if they are, they fall under a hearsay exception. See Ex. 1068 ¶¶ 10–11.

As an example, Mr. Bross testifies “I recall receiving inquiries from video coding personnel regarding when they could expect the next update to the Working Draft of the HEVC Standard to be uploaded to the JCT-VC site and circulated on the JCT-VC listserv.” Ex. 1068 ¶ 11. Petitioner does not offer these inquiries as out of court assertions. These inquiries do not constitute hearsay, rather they constitute a verbal act or non-hearsay. In other words, asking about when updates could be uploaded to the JCT-VC websites carries significance regardless of the truth of the statement, because it shows awareness of the website and the standards. See Fed. R. Evid. 801, Notes of Advisory Committee on Proposed Rules Subdivision C (“If the significance of an offered statement lies solely in the fact that it was made, no issue is raised as to the truth of anything asserted, and the statement is not hearsay.”). Also the inquiries or questions were not intended to be assertions, and do not constitute statements. See Fed. R. 801(c) (“‘Statement’ means a person's oral assertion, written assertion, or nonverbal conduct, if the person intended it as an assertion.”).

Further regarding the inquiries, Mr. Bross recalls “interactions” with representatives from Qualcomm and Broadcom[] who inquired about the expected release date of the next version of the Working Draft on the JCT-VC site and had comments on the current version of the Working Draft on the JCT-VC site,

including how the proposed coding specification in the Working Draft would affect their products and services.

Id.

For the reason noted above, these inquiries also do not constitute hearsay—i.e., they represent verbal acts or non-hearsay showing the representatives knew about the JCT-VC server. Also, even if the verbal acts represent an assertion, Petitioner does not offer the statement as an assertion to show that “the proposed coding specification in the Working Draft would affect . . . products and services,” but rather as circumstantial evidence to show that engineers possessed an on-going and current belief about the proposed coding, thereby circumstantially showing they knew about the JCT-VC website, and also possessed an intent or motive to obtain documents on the JCT-VC site to ensure produce compliance. *See* Opp. Reply 5–6 (citing *Lyons P’ship, L.P. v. Morris Costumes, Inc.*, 243 F.3d 789, 804 (4th Cir. 2001) (“[Plaintiff] did not offer the children’s statements or the newspaper articles to prove the truth of the matter asserted—i.e., that the persons wearing the Duffy costume were in fact Barney—but rather merely to prove that the children and the newspaper reporters expressed *their belief* that those persons were Barney. This was direct evidence of the children’s and the reporters’ reactions and not hearsay.”)).

Stated another way, similar to the non-hearsay statements in *Lyons*, Petitioner does not offer the statements by the engineers or representatives to prove the truth of the matter asserted, or the statements fall under a hearsay exception. For example, the representatives from Qualcomm and Broadcom expressed an on-going belief or concern while conversing with Mr. Bross

that the HEVC standards would affect their products and services. See Ex. 1068 ¶ 11. But Petitioner does not offer the statements for the truth that the HECV standards would affect products and services. Moreover, the testimony demonstrates knowledge of the JCT-VC website. See *id.* (inquiring about the website). It also shows that the engineers and their institutions had a then-existing plan or intent to visit the JCT-VC website—so that they should have been able to find the documents because “they wanted to.” See *GoPro*, 908 F.3d at 694; Fed. R. Evid. 801(c) (limiting the definition of hearsay to statements offered “to prove the truth of the matter asserted”); cf. Fed. R. Evid. 803(1) (creating an exception to hearsay rule for a statement about “an event or condition made while the declarant or immediately after the declarant perceived it”); Fed. R. Evid. 803 (3) (creating an exception to hearsay for a “statement of the declarant’s then-existing state of mind (such as motive, intent, or plan) . . . , but not including a statement of memory or belief to prove the fact remembered”).²³

Further regarding Fed. R. Evid. 803(1) and Fed. R. Evid. 803 (3), no reason existed for the engineers or representatives to lie about potential problems based on “the impact of the proposed changes,” while conversing with Mr. Bross during the same time as they perceived or believed the problems may arise if they followed the then-existing standards, and the statements provide a basis for Mr. Bross’s testimony that artisans regularly

²³ *Lyons* also cites the presence sense impression exception to hearsay. See Fed. R. Evid. 803(1) (creating an exception to hearsay rule for a statement about “an event or condition made while the declarant was perceiving the event or condition, or immediately thereafter”). *Lyons*, 243 F.3d at 804.

visited the website and provide an inference of an intent to visit the website and follow the standards development. *See* Ex. 1068 ¶¶ 10–12; *United States v. Ponticelli*, 622 F.2d 985, 991 (9th Cir. 1980) (noting Fed. R. Evid. 803(3) “is a specialized version of Fed. R. Evid. 803(1), which permits admission of present sense impressions”)).

Patent Owner does not address these specific statements quoted above from paragraph 11 of the Supplemental Declaration, but seeks to exclude that whole paragraph and paragraph 10. In summary, Patent Owner’s Motion refers to Mr. Bross’s statement about experienced persons “tracking the developments . . . by regularly visiting the JCT-VC site to ensure that products site to ensure that products and services they were developing were consistent with the HEVC Standard under development.” Mot. 2 (citing Ex. 1068 ¶ 10). Patent Owner asserts this statement and other “discussions” (*id.* (quoting Ex. 1068 ¶ 11)) and statements about “interactions with representatives from Qualcomm and Broadcom.” (*id.* (citing Ex. 1068 ¶ 11)) do not represent “first-hand knowledge” (*id.*) and “are the epitome of hearsay.” *See* Reply Mot. 1. As determined here, Mr. Bross’s testimony shows first-hand knowledge about what he heard, and what he heard includes a relevant non-hearsay purpose or falls under a hearsay exception as a relevant belief or intent, similar to the alleged hearsay statements in *Lyons*.

Under an alternative analysis, we adopt Petitioner’s showing that the statements fall under the residual hearsay exception. *See* Fed. R. Evid. 809(a); Opp. 7–10. First, the statements have “equivalent circumstantial guarantees of trustworthiness.” Fed. R. Evid. 807(a)(1). Mr. Bross merely explains that representatives possessed the intent to track developments of

the HEVC standards on the JCT-VC server to ensure product compliance. See Ex. 1002 ¶ 206; Ex. 1068 ¶¶ 10–11. Dr. Vetro provides similar testimony with respect to further dissemination of HEVC documents on the MPEG server. Ex. 1050 ¶ 23. Mr. Bross provides similar unchallenged testimony about others interested in video coding, including “representatives in the video coding industry, university professors, and research institutions” as being “aware of the developments of the HEVC Standard and the open and public nature of the documentation provided by the JCT-VC, including through its JCT-VC website.” Ex. 1068 ¶ 13; *see also* Ex. 1002 ¶ 206. As discussed above, other documents of record reveal the purpose for the JCT-VC server as an archive for document storage and retrieval for review of the standards documents. *See* Ex. 1016, 1–2; *supra* § II.D.3.f–g. Other evidence also shows that emerging video coding standards typically result in new products, and non-members of JCT-VC were or should have been aware of the JCT-VC. *See* Ex. 1070, 1; Ex. 1016, 1–2; Ex. 1020, 1; Ex. 1071–72.

Second, Petitioner persuasively offers Mr. Bross’s statements “as evidence of a material fact.” *See* Fed. R. Evid. 807(a)(2). As indicated above, the statements tend to show that interested artisans exercising reasonable diligence should have been able to visit the website and had a motive to do so.

Third, “Mr. Bross’[s] statements are ‘more probative on the point for which [they are] offered than any other evidence that the proponent can obtain through reasonable efforts.’” Opp. 9 (quoting Fed. R. Evid. 807(a)(3)). Petitioner persuasively explains “[i]t would not have been

reasonable to expect Petitioner to locate the specific individuals (who may have since switched employment), even assuming Mr. Bross could recall those individuals' names.” *Id.* at 10. A span of about seven or eight years exists between the conversations and this proceeding, supporting Petitioner.

Finally, “admitting [Mr. Bross’ statements] will best serve the purposes of these rules and the interests of justice.” *Id.* at 10 (quoting Fed. R. Evid. 807(a)(4)) (alteration by Petitioner). As Petitioner indicates, Patent Owner cross-examined Mr. Bross about his testimony, it relates to conversations Mr. Bross testifies actually occurred, the statements relate to the question of accessibility, and allowing the statements into the record provides efficient and expedited relief, weighed under the engine of cross-examination by Patent Owner. *See id.*; Ex. 2026, 134–136 (cross-examination); *supra* § II.D.3.f.

Patent Owner’s Reply arguments do not undermine the analysis above. Patent Owner’s arguments largely rest on the contention that it should have been able to cross-examine the engineers and representatives. *See* Reply Mot. 5 (“Patent Owner did not have an opportunity to examine anyone claiming to have made the statements to test their recollection or the veracity of the comments attributed to them.”). The residual hearsay exception does not operate to allow cross-examination of hearsay declarants. Also, Patent Owner’s generalized objections, as described above, served to undermine the ability of Petitioner to locate the witnesses timely (assuming Mr. Bross could have identified them).

For the foregoing reasons, Patent Owner does not meet the burden on its Motion. In addition, even if we disregard statements by Mr. Bross in

paragraphs 11 and 12 that we hold here fall under a hearsay exception or constitute non-hearsay, it would not alter the outcome, given other evidence, including (but not requiring) the evidence of a verbal act discussed above, and including other Exhibits discussed above collectively showing that interested artisans exercising reasonable diligence should have been able to visit the website and would have known it archived HEVC standards, lending a reason to visit it.

V. ORDER

Accordingly, it is

ORDERED that that Petitioner has proved by a preponderance of the evidence that claims 1–7 of U.S. Patent No. 9,191,673 are unpatentable;

FURTHER ORDERED that Patent Owner’s Motion to Amend is granted;

FURTHER ORDERED that Patent Owner’s Motion to Exclude Evidence is *denied*;

FURTHER ORDERED that claims 1–7 of U.S. Patent No. 9,191,673 be cancelled and claims 8–14 be added to the patent; and

FURTHER ORDERED that, because this is a Final Written Decision, parties to the proceeding seeking judicial review of the decision must comply with the notice and service requirements of 37 C.F.R. § 90.2.

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PETITIONER:

Naveen Modi
Joseph E. Palys
Quadeer A. Ahmed
PAUL HASTINGS LLP
naveenmodi@paulhastings.com
josephpalys@paulhastings.com
quadeerahmed@paulhastings.com

PATENT OWNER:

John A. Bauer
Kongsik Kim
Jonathon P. Western
MINTZ, LEVIN, COHN, FERRIS, GLOVSKY and POPEO, P.C.
jabauer@mintz.com
kkim@mintz.com
jpwestern@mintz.com