

UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE PATENT TRIAL AND APPEAL BOARD

AMAZON.COM, INC., AMAZON.COM SERVICES, LLC,
Petitioner

v.

NOKIA TECHNOLOGIES OY,
Patent Owner

Case: IPR2024-01505
U.S. Patent No. 9,571,833

PATENT OWNER'S PRELIMINARY RESPONSE

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Exhibit	Description
2001	Declaration of Dr. Iain Richardson
2002	CV of Dr. Iain Richardson
2003	Omitted
2004	Omitted
2005	Omitted
2006	Improved Video Compression Efficiency Through Flexible Unit Representation and Corresponding Extension of Coding Tools by Woo-Jin Han, <i>et al.</i>
2007	A Multi-Pass True Motion Estimation Scheme with Motion Vector Propagation for Frame Rate Up-Conversion Applications by Shen-Chuan Tai, <i>et al.</i>
2008	A Multistage Motion Vector Processing Method for Motion-Compensated Frame Interpolation by Ai-Mei Huang, <i>et al.</i>
2009	Bross, “BoG Report on MV Coding and Throughput/Parsing Robustness,” Joint Collaborative Team on Video Coding (JCT-VC) of ITU-T SG16 WP3 and ISO/IEC JTC1/SC29/WG11, 6th Meeting, Torino, Italy, Jul. 14-22, 2011, Document JCTVC-F744 (“F744”)
2010	January 20, 2025 Deposition Transcript of Dr. Charles D. Creusere from IPR2024-00604 and -00605
2011	Excerpts from “The H.264 Advanced Video Compression Standard”, Richardson, 2010 (Cover pages, book pages 28-38, 69, 106, 108, 223-229)

Exhibit	Description
2012	Gary J. Sullivan et al, “Overview of the High Efficiency Video Coding (HEVC) Standard,” in <i>IEEE Transactions on Circuits and Systems for Video Technology</i> , vol. 22, no 12, pp. 1649-1668
2013	January 23, 2025 Deposition Transcript of Dr. Clifford Reader
2014	ITU-T Series H: Audiovisual and Multimedia Systems, Infrastructure of audiovisual service – Coding of moving video, High efficiency video coding (H.265) (04/2013)
2015	Bici et al., “Non-CE13: Simplification of merge mode,” Joint Collaborative Team on Video Coding (JCT-VC) of ITU-T SG16 WP3 and ISO/IEC JTC1/SC29/WG11 7th Meeting: Geneva, CH, 21-30, November, 2011, Document JCTVC-G593
2016	Bici et al., “CE9: Results of SP experiments on simplification of merge process,” Joint Collaborative Team on Video Coding (JCT-VC) of ITU-T SG16 WP3 and ISO/IEC JTC1/SC29/WG11 8th Meeting: San José, CA, USA, 1–10, February, 2012, Document JCTVC-H0252
2017	Kim et al., “CE9: Summary report of core experiment on MV coding and Skip/Merge,” Joint Collaborative Team on Video Coding (JCT-VC) of ITU-T SG16 WP3 and ISO/IEC JTC1/SC29/WG11 8th Meeting: San José, CA, USA, 1–10, February, 2012, Document JCTVC-H0039
2018	Sullivan et al., “Meeting report of the eight meeting of the Joint Collaborative Team on Video Coding (JCT-VC), San Jose, US, 1–10 Feb. 2012,” Joint Collaborative Team on Video Coding (JCT-VC) of ITU-T SG16 WP3 and ISO/IEC JTC1/SC29/WG11 8th Meeting: San Jose, US, 1–10 Feb. 2012, Document JCTVC-H1000

I. INTRODUCTION

Petitioner advances two arguments in the Petition, one based on two patent publications (Rusert and Zheng) and one based on two prior art references that were considered by the examiner during prosecution (Nakamura and WD4). For both grounds, the Petition relies on the disclosures of a single reference (Rusert and Nakamura) to satisfy the limitations of the independent claims. However, both Rusert and Nakamura fail to satisfy multiple limitations. Institution should therefore be denied.

II. BACKGROUND

A. Motion-Compensated Prediction in Video Coding

Many video coding techniques exploit pixel redundancy in both the spatial and temporal domains and involve finding ways to transmit new information in a bitstream by referencing already communicated information. Ex-2001 at ¶ 52. The goal of these techniques is to reduce the amount of information needed to transmit, store, and play back video. An encoder can signal to a decoder that it should use previously coded data to generate an approximation, or prediction, of a block of pixels in a current frame. The encoder may include additional information, called prediction error or residual information, in a bitstream that a decoder can combine with a prediction to reproduce a reconstructed block. In sum, an encoder communicates to the decoder how to make predictions for each block as well as any

residual information in a compressed form, and the decoder creates a prediction, decodes any residual information, and combines residual and prediction to reconstruct a block of pixels. *Id.*

There are two main ways of exploiting redundancy in video coding to create such predictions—intra coding and inter coding. With an intra-coded block, a reference to already coded pixels in the same frame is used to create a prediction. Typically, inter-coding uses motion-compensated prediction. *Id.* at ¶ 53. The idea behind motion-compensated prediction is to use blocks of pixels from one or more coded frames to predict blocks of pixels in a current frame. Previously coded frames used for motion-compensated prediction are known as reference pictures or reference frames. *Id.* Reference pictures are prior to a current frame in coding order, but this does not necessarily correspond to the frames' display order.¹ Motion vectors identify the relevant region of pixels in a reference frame to be used for motion-compensated prediction. Instructions for creating a prediction are encoded into a bitstream along with any prediction error or residual information. *Id.*

In video coding, motion may be approximated as being block-wise constant. Blocks in a frame are represented by motion vectors with horizontal and vertical

¹ That is, it is possible to use a reference frame that will be displayed *after* the current frame.

components. An example block size for prediction is 16x16 pixels. This is known as a luminance block.² Modern video coding techniques allow for blocks of various sizes, including blocks ranging from 4x4 to 64x64. *Id.* at ¶ 55.

The '833 Patent relates to Merge mode, which is an inter prediction mode in the H.265 video coding standard. Merge mode exploits the property that motion vectors (i.e., indications of a prediction source in a reference frame) of neighboring blocks are often similar. In Merge mode, the encoder and decoder form lists of motion vector prediction candidates, i.e. motion vectors of neighboring blocks that can be used to predict the motion vector for a current block being encoded/decoded, called merge lists, and then—through an indication in a bitstream—the encoder communicates to the decoder which motion vector prediction candidate to use as the motion vector for a current block being encoded/decoded.³ Merge mode reduces the

² The term “macroblock” relates to an assembly of blocks, including a “luminance block” (typically 16x16 pixels) and two co-located (and spatially sub-sampled) blocks (typically 8x8 pixels each) of corresponding color (chrominance) information.

³ In Merge mode, a motion vector predictor is selected from a list of candidates, where each candidate is a motion vector from a previously encoded block. The index of the selected candidate in the list is then encoded and transmitted to the decoder.

amount of data needed to transmit, store, and playback video by eliminating the need to transmit motion vectors directly, instead sending an index to identify a prediction for the motion vector of the current block from the merge list.

However, Merge mode can lower prediction accuracy if the motion vectors in the list do not provide accurate predictions. *Id.* at ¶ 63. Moreover, Merge mode requires additional processing by encoders and decoders to construct lists. Prior to the method proposed by the '833 Patent, some Merge mode proposals relied on exhaustive comparisons to build merge lists that were computationally demanding. As with other video coding techniques, the best approach to Merge mode involves a balance of several factors. For example, longer merge lists could improve prediction accuracy, but longer merge lists would require added computational complexity to build the merge lists and additional bits in bitstreams to represent them. The '833 Patent provides a more efficient method for constructing merge lists that reduces the computational demands on encoders and decoders to build merge lists while allowing for precise motion vector predictions.

The H.265 standard specifies that decoders will form the list of candidates using up to four motion vector candidates spatial neighbors in the current frame, and a temporal candidate. Ex-2001 at fn. 6.

1. Role of Encoder in Motion-Compensated Prediction

One of the most computationally intensive tasks in motion-compensated prediction is selecting the motion vector for a prediction. This is usually achieved by dividing the current frame into blocks and finding matching regions in previously coded reference frames to predict the blocks in the current frame. Identifying the best matching region requires numerous comparisons between the current block and various regions from the reference frames, each with a different motion vector relative to the current block, to find the optimal match. This process is known as motion estimation. *Id.* at ¶ 66.

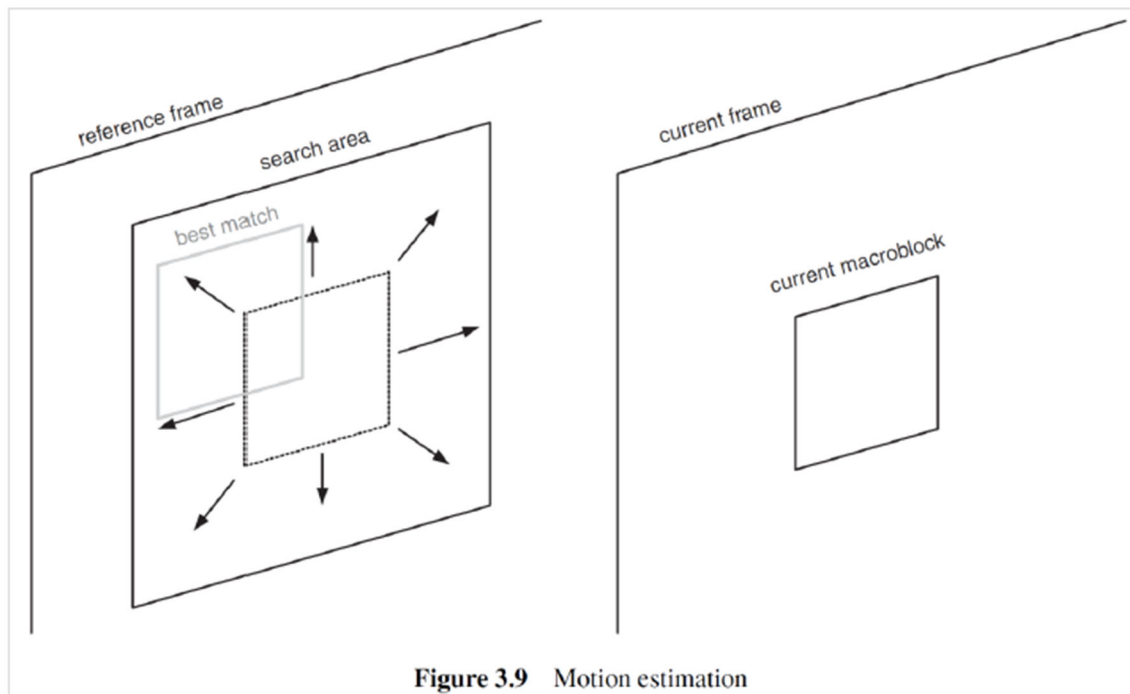


Figure 3.9 Motion estimation

The H.264 Advanced Video Compression Standard, Iain Richardson, 2010, at Section 3.3.1.4 (Ex-2011)

Once a suitable block prediction method is chosen and motion vector(s) are identified, the encoder encodes the instructions necessary to recreate the block prediction. These instructions may include the motion vector(s) (or how to predict the motion vector(s)) and whether they are to be used as part of a uni- or bi-prediction,⁴ and an indication of one or more reference pictures. *Id.* at ¶ 68.

2. Role of Decoder in Motion Compensated Prediction

In inter prediction, a decoder, at a high-level, decodes the bitstream to determine how to predict a block of pixels. It then decodes any prediction error and adds it to the prediction to obtain a reconstructed block of pixels. *Id.* at ¶ 69.

3. Transmission and Decoding of Motion Vectors

Motion vector data can constitute a significant portion of a compressed video frame, especially when small block sizes are used. Thus, the amount of data needed to transmit, store, and play back video can be reduced by minimizing the data needed to represent motion vectors. Motion vectors from adjacent blocks (both spatially and

⁴ Uni-prediction involves one reference block. Bi-prediction involves two reference blocks (which can be from one or more frames).

temporally)⁵ tend to be correlated. This redundancy can be leveraged. For example, the motion vector for a current block can be predicted based on the motion vectors of its neighboring blocks. *Id.* at ¶ 56.

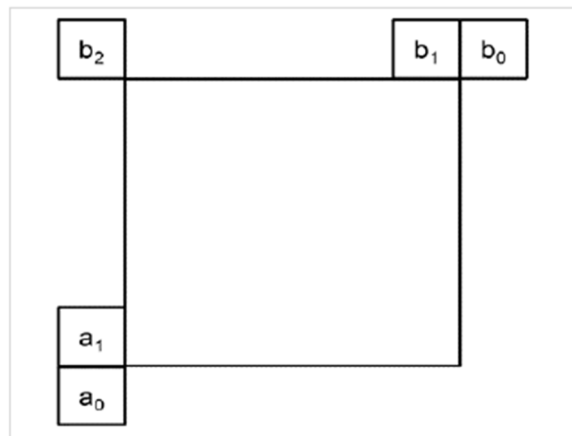
Any discrepancy between the current motion vector and its predicted value can be losslessly encoded in the bitstream and decoded by the decoder. In this way, the decoder can predict a motion vector based on previously decoded motion vectors and reconstruct an intended motion vector by adding any signaled difference. *Id.* at ¶ 57.

4. Merge Mode

H.265-compliant decoders can employ more advanced methods for predicting motion vectors. H.265-compliant decoders can utilize the Merge mode previously discussed. *Id.* at ¶ 61. The following figure, taken from the 2012 paper by Gary Sullivan *et al.* titled “Overview of the High Efficiency Video Coding (HEVC) Standard” (Ex-2012), illustrates the five spatially adjacent blocks (a0, a1, b0, b1, and b2) that are neighbors to a current block and which are considered for Merge mode. *Id.* at ¶ 64. The order in which the availability of these blocks for Merge mode is

⁵ Spatially adjacent blocks are those in the same frame as a current block of pixels being encoded or decoded. Temporally adjacent blocks are those in previously coded frames.

assessed as follows: a_1 , b_1 , b_0 , a_0 , b_2 . Additionally, a temporal candidate from the same location in a reference frame (a previously coded frame, not the current frame) is evaluated. *Id.* A decoder can identify which candidate to use for a predicted motion vector via an index value in a bitstream. Then, the motion information for the current block is inherited from the selected candidate block, resulting in the motion information for both blocks effectively being merged. *Id.*



Ex-2012 at Figure 8

It is common for two or more candidates in the list to share the same motion vector. Removing duplicate motion vectors is advantageous as it shortens the list and reduces the number of bits required to identify the selected motion vector from the list. However, comparing candidates for possible elimination can be computationally intensive. One of the objectives of the '833 Patent is to provide an improved merge list process that “reduce[s] the complexity of the implementation [of Merge mode].” Ex-1001 at 4:7–19; Ex-2001 at ¶ 65.

The '833 Patent arose from the inventors' work developing the Merge mode of the H.265 standard. Nokia contributed to the H.265 Merge mode process. The inventors of the '833 Patent presented their solution for a more efficient and less computationally demanding Merge mode in the JCTVC-G593⁶ and JCTVC-H0252 contribution documents. Ex-2015; *see also* Ex-2016. Merge mode was a focal point of a "core experiment" conducted by the JCTVC. Nokia's JCTVC-H0252 proposal was tested and ultimately accepted by the JCTVC, the committee responsible for creating the H.265 standard. Ex-2001 at ¶ 62. The Report on the Merge mode core experiment is JCTVC-H0039, and the Meeting Report that formally adopted Nokia's contribution through JCTVC-H0039 is JCTVC-H1000. Ex-2017; *see also* Ex-2018. Nokia's approach was accepted during the eighth JCTVC meeting in February 2012. Ex-2001 at fn. 5.

B. The '833 Patent

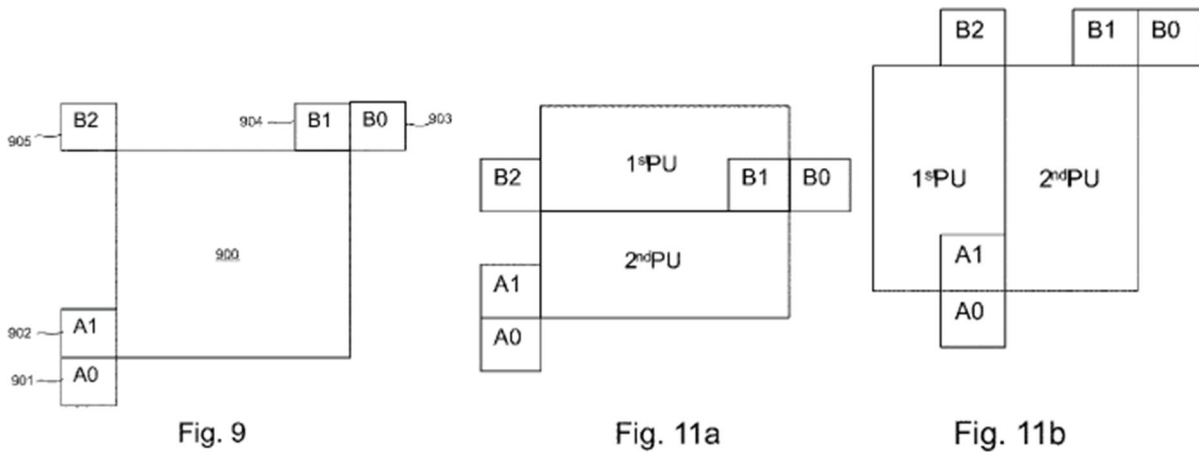
The inventors of the '833 Patent sought to reduce the computational complexity of constructing Merge lists, including the process of comparing candidates in order to remove redundant candidates. Ex-1001 at 4:7–12.

A brief analysis of the potential number of such candidates confirms the scale of the potential problem. A 1080p (High Definition) video frame has $1920 \times 1080 =$

⁶ JCTVC stands for the Joint Collaborative Team on Video Coding.

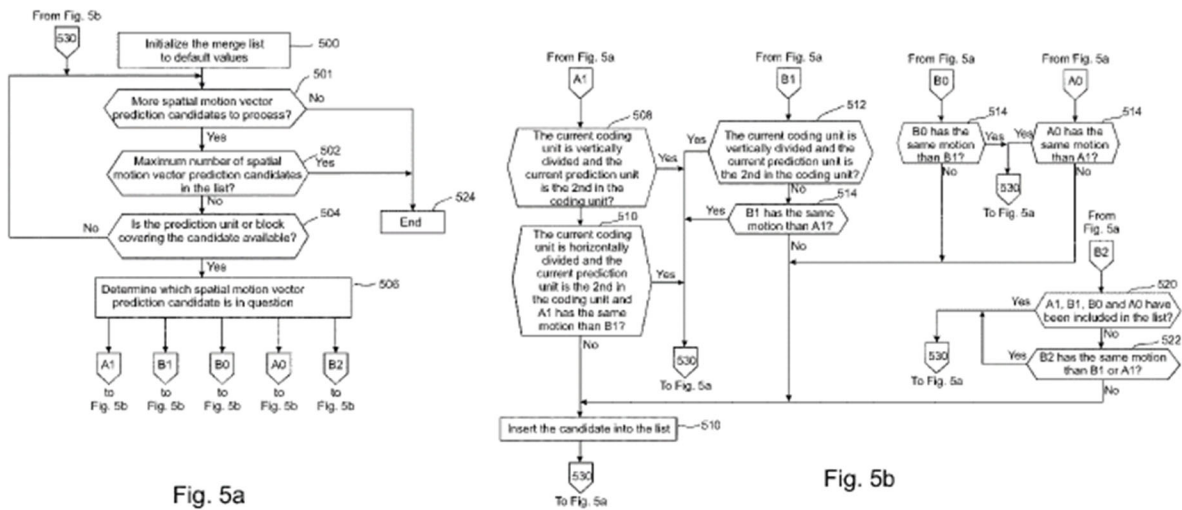
2,073,600 pixels. Inter prediction units can be as small as $4 \times 4 = 16$ pixels, resulting in up to 129,600 prediction units per frame ($2,073,600 / 16$). Assuming each unit uses Merge mode with 5 candidates, and each candidate is compared once to every other candidate (10 comparisons), this totals 1,296,000 comparisons per frame ($129,600 \times 10$). At 30 frames per second, this could reach 38,880,000 comparisons per second ($1,296,000 \times 30$). While most videos use a mix of larger and smaller inter prediction units and other coding methods, decoders would have to be computationally capable of performing this number of comparisons per second to decode video.

Figure 5 of the '833 Patent illustrates an improved embodiment for constructing a merge list. In this embodiment, merge list candidates A0, A1, B0, B1, and B2 are part of a set of spatial motion vector prediction candidates, with block 900 representing a current block of pixels. Figures 9 and 11, reproduced below, label the locations of merge list candidates relative to the current block. In Figures 11a and 11b, the current block 900 has been divided into two smaller prediction units (PU), and in each case the candidates are shown for the second prediction unit in the block. Ex-2001 at ¶ 71.



Ex-1001 at Figures 9, 11a, and 11b

Figures 5 and 8 illustrate the encoder and decoder processes for merge list construction, respectively, such that encoder and decoder construct their merge lists in the same manner. Figures 5a and 5b are reproduced below:



Ex-1001 at Figures 5a and 5b

Each motion vector prediction candidate (A0, A1, B0, B1, and B2, which correspond to the locations of the blocks associated with these candidates)⁷ undergoes a limited set of comparisons and conditions to determine its inclusion in the merge list. Ex-2001 at ¶ 72. By eliminating unlikely or illogical candidates, this embodiment reduces the worst-case scenario for comparisons from 10 to 6 (Ex-1001 at 14:9–16:45), significantly reducing the number of comparisons that need to be performed to construct the merge list. As one example, and as seen in Figure 5b above, if B2 is the first spatial motion vector prediction candidate, and A1, B1, B0, and A0 have not been included in the merge list (i.e., the maximum number of spatial motion prediction candidates has not been reached), B2’s motion information is only compared to B1 and A1’s motion information. This is reflected, for example, in steps 520 and 522 of Fig. 5b. Ex-1001 at 16:29–38.

C. The ’833 Patent’s Prosecution History

The ’833 Patent claims priority to a provisional patent application filed on November 4, 2011. The ’833 Patent issued from a utility application (App. No. 13/666,680 (the “’680 Application”), Ex. 1002) that was subject to multiple Office Actions and responses before being allowed.

⁷ A POSITA would understand that labels like “A0” in Figure 9 can refer to both the block location and its associated motion vector.

The originally filed claims in the '680 Application had many elements in common with the Challenged Claims. *Compare* Ex-1002 at 52-61 *with* Ex-1001 at cl. 9. Both recite: (1) selecting a first spatial motion vector prediction candidate that is selected from a set of spatial motion prediction candidates for a block of pixels; (2) determining a subset of spatial motion vector predictions based on a location of the block associated with the first spatial motion vector prediction candidate; (3) comparing motion information of the first spatial motion vector prediction candidate with motion information of spatial motion vector prediction candidates in the determined subset of spatial motion vector prediction candidates; and (4) excluding the first spatial motion prediction candidate based on the comparing.

The original claims were rejected over a combination of Han, Woo-Jin, et al.; “*Improved Video Compression Efficiency Through Flexible Unit Representation and Corresponding Extension of Coding Tools*”; Circuits and Systems for Video Technology; IEEE Transactions on Dec. 20, 2010; 1709-1720 (Ex-2006) (“Han”) and Tai, Shen-Chuan, et al.; “A Multi-Pass True Motion Estimation Scheme with Motion Vector Propagation for Frame Rate Up-Conversion Applications”; Journal of Display Technology; 4.2 (2008): 188-197 (Ex-2007) (“Tai”). The Examiner wrote that Han teaches “receiving a block of pixels including a prediction unit,” but does not teach explicitly the remainder of the limitations, which Tai teaches. Ex-1002 at 196-199. Thus, according to the Examiner, “[i]t would have been obvious to one

with ordinary skill in the art at the time of invention, to modify the teachings of Han with the teachings of Tai to use the geometric relationship proposed in [2] describing the correlation between the current block position and the motion edge to reduce the number of PMV predictors to be evaluated.” *Id.* at 198.

PO responded by amending the independent claims to recite, “where the merge list is selected based on the motion information . . . and if at least one of the comparisons indicates that the motion vector information of the spatial motion vector prediction candidates correspond with each other, excluding the first spatial motion vector prediction candidate from the merge list.” Ex-1002 at 774 (emphasis in original). In the subsequent Final Rejection, the Examiner disagreed and added a reference to the Han-Tai combination—Huang, Ai-Mei et al., “*A Multistage Motion Vector Processing Method for Motion-Compensated Frame Interpolation*,” Image Processing, IEEE Transactions on May 17, 2008, pp. 694-708 (Huang, Ex-2008; Ex-1015 at 272) (“Huang”). The Examiner stated that, although the Han-Tai combination does not teach explicitly “where the merge list is selected based on the motion [information],” this is taught by Huang. Ex-1002 at 808–809.

In response, PO amended the independent claims to recite, “comparing motion information of the first spatial motion vector prediction candidate with motion information of spatial motion vector prediction candidates in the determined subset of spatial motion vector prediction candidates [is performed] without making

a comparison of each possible candidate pair from the set of spatial motion vector prediction candidates[.]” *Id.* at 998.

Following this amendment, the Examiner allowed the claims of the '680 Application. *Id.* at 1045.

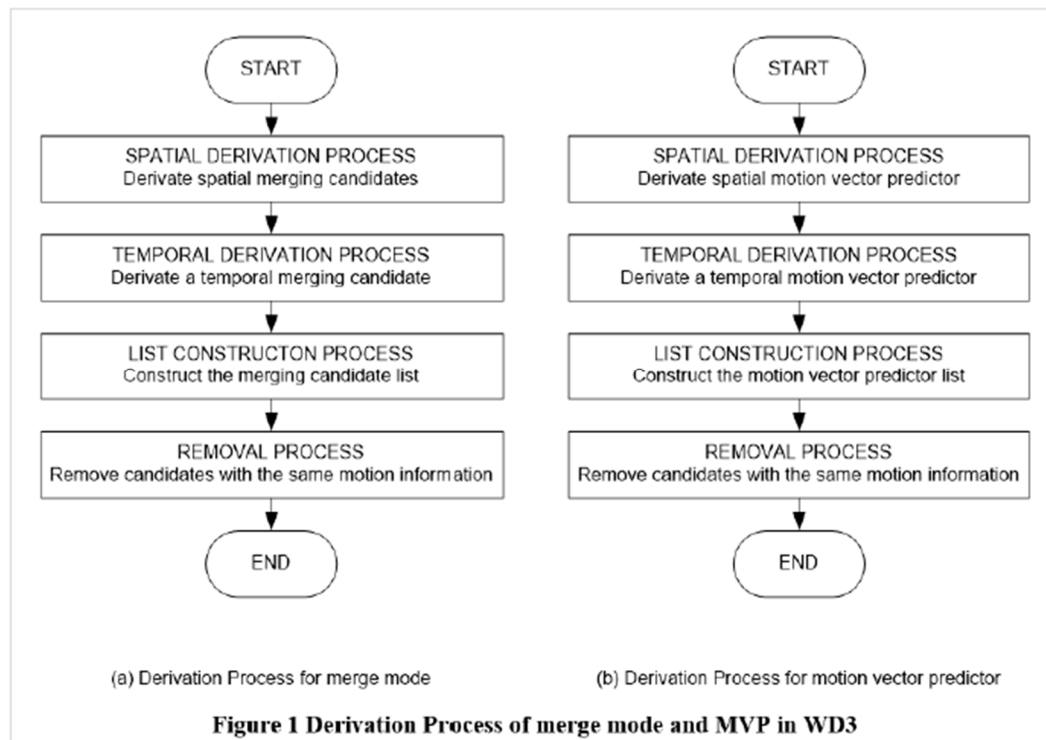
D. The Asserted Prior Art

1. Nakamura (Ex-1007 – Ex-1009)

Nakamura (JCTVC-F419) is a submission to the JCTVC, the ITU-T and ISO/IEC working group responsible for developing the HEVC standard. Petitioner relies on several separate documents consisting of a written description of a proposal, a presentation summarizing the proposal, draft language for implementing the proposal in the HM (the Test Model document describing the then-current draft HEVC standard), and spreadsheets summarizing performance tests performed to compare the proposal to the current HM.

Nakamura is a proposal that attempted to provide methods for deriving candidates for Merge mode and the motion vector predictor (MVP), which is a distinct prediction mode. Ex-1007 at § 1. Nakamura proposed that the positions of the spatial neighbors eligible as merging candidates should align with those of the spatial MVP candidates, effectively unifying the locations of spatial neighbors for both Merge mode and MVP. *Id.* Additionally, the proposed methods sought to

harmonize the derivation processes for Merge mode and MVP, as shown in Figure 1:

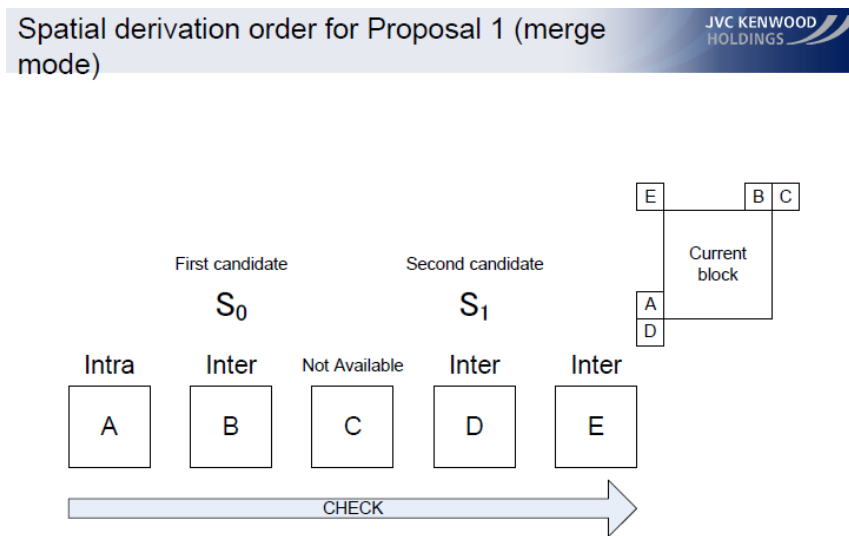


Nakamura, JCTVC-F419.doc (Ex-1007) at 2.

For Merge mode, Nakamura teaches selecting two spatial motion vector prediction candidates (S0 and S1) for a merge list, which are chosen in a spatial derivation order (or scan order) from blocks A, B, C, D, and E (blocks within the current frame), in the figure below, relative to the current prediction unit.⁸ *Id.* at

⁸ The JCTVC committee adopted Nokia's Merge mode proposal over Nakamura's proposal as part of the draft HEVC/H.265 standard. Ex-2018; Ex-2001 at fn. 9.

Abstract, § 1, § 2.2.1, Figures 1, 2(b), Tables 2–4. Specifically, Nakamura checks blocks A-E to find the first available motion vector, which is then designated as spatial candidate S0. Ex-1009 at 8. Once S0 is selected (i.e., it is assigned to the motion vector corresponding to one of the neighboring block locations), it is automatically added to Nakamura’s merge list. *Id.* Nakamura then proceeds to check for the availability of a second candidate, S1, which is similarly assigned to the next available motion vector and automatically added to the merge list once identified. *Id.*



Amazon.com, Inc., Amazon.com Services LLC - Ex. 1009, Page 000008

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Ex-1009 at 8.

Petitioner incorrectly alleges that Nakamura’s S0 corresponds to a “subset” as described in the claims of the ’833 Patent. Nakamura’s S0 is determined before Nakamura knows which block’s motion vector will be assigned to S1 (which

Petitioner claims is the “first spatial motion vector prediction candidate” of the claims). Therefore, S0 (the alleged “subset”) cannot be determined based on the location of S1 (the block associated with the “first spatial motion vector prediction candidate”, required by the claims) because Nakamura does not have knowledge of or confirmation regarding the location of S1 when determining S0. Ex-2001 at ¶ 83. In other words, ***S0 is not determined based on the location of S1.*** Ex-1007 at § 2.2.1; Ex-1009 at 1, 8. The subset S0 remains unchanged regardless of the later choice of S1, as S0 is already selected before S1 is determined. Ex-2001 at ¶ 84.

2. WD4 (Ex-1010)

WD4 is a working draft of the H.265 standard posted on the JCT-VC’s website sometime after the meeting where Nakamura was presented. *See infra* Section III(B)(3).

3. Rusert (Ex-1004)

Rusert (U.S. Patent App. Pub. No. 2011/0194609, Ex-1004) is a published patent application titled “Selecting Predicted Motion Vector Candidates” and naming Thomas Rusert, Jacob Ström, Kenneth Andersson, Per Wennersten, and Rickard Sjöberg as inventors.

Rusert discloses a method for generating a potential motion vector (“PMV”) candidate list, PMV_CANDS, for a current block of pixels that is either being encoded or decoded. *See* Ex-1004 at ¶¶ 11–12, 36–37. The PMV candidates are

derived from previously coded neighboring blocks within an allowed distance from the current block. *See id.* at ¶¶ 11, 40–44, 73. As each new PMV candidate is considered for addition to PMV_CANDS, it is compared to the current members of PMV_CANDS to ensure that no redundant PMVs are added to the list. Ex-1004 at ¶¶ 70–73. Petitioner’s expert, Dr. Creusere, characterizes the previously coded blocks in Rusert’s scan order as the “spatial motion vector prediction candidates.” Ex-2010 at 72:11–76:19; Ex-2001 at ¶ 74.



Rusert (Ex-1004), Fig. 3f (showing the distance of neighbors),
Fig. 3n (showing the scan order)

Rusert discloses search or scan patterns for PMVs in an “outward scan . . . around the current block.” Ex-1004 at ¶¶ 44, 51–66; *see id.*, Figures 3a–3n (illustrating the numerical scan order around the current block, labeled ‘.’, starting from block 1 and progressing outward in a counterclockwise direction).



Fig. 3n

Id. at FIG. 3n (annotating the outwards going scan). Using Figure 3n as an example, the PMV_CANDS list can ultimately include the blocks available in the scan order, such as some or all of 1, 2, 3, . . . , a, b, c, and so on. Ex-2010 at 75:6–76:1; *see also id.* at 72:11–76:19. In Figure 3n, the current block is represented by a dot. The evaluation begins with the previously coded block immediately above the current block, labeled ‘1’, if available. The next block to the left of the current block, labeled ‘2’, is evaluated if available, and so on. Ex-2001 at ¶ 75.

Some of the blocks in Rusert’s scan order may not be available, such as when the current block is near a frame boundary, when certain blocks have not yet been encoded by the time the current block is processed, or when some blocks do not have a motion vector, like intra-coded blocks. Rusert discusses scenarios where blocks may be unavailable, including cases where blocks have not been encoded or lack a motion vector. Ex-1004 at ¶ 54, Figure 3c. Figure 3c illustrates an example where

some blocks from the scan order in Figure 3b are unavailable, showing that only blocks 1, 2, 9, h, j, l, and m are available for inclusion in the PMV_CANDS list. Ex-2001 at ¶ 76.

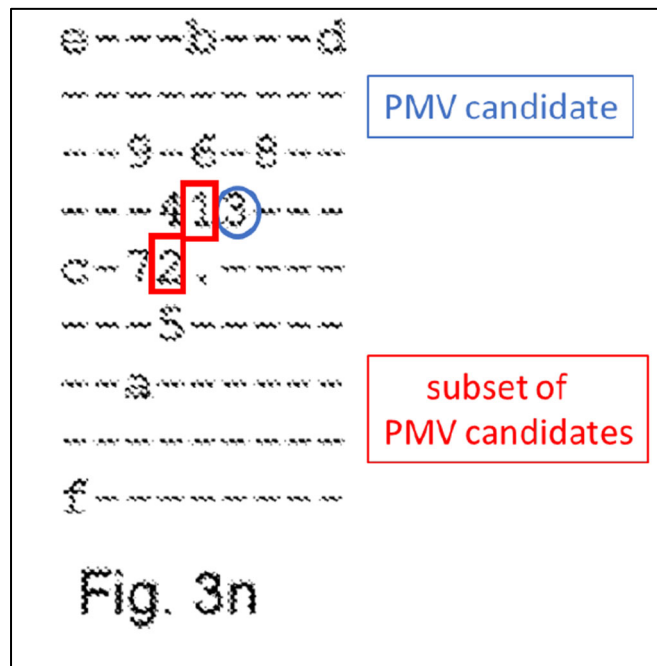
ld9em
e816g
a2.3b
h748i
njcko
Fig. 3b

1-9-m
--1--
-2.--
h-----
-j-----
Fig. 3c

Ex-1004 at Figures 3b–3c.

As previously discussed, Rusert conducts an outward scan of selected and available previously coded PMV candidates, beginning from the current block and staying within an allowed distance. *Id.* at ¶¶ 4–5, 36–39, 43–44, 51–66; Ex-2001 at ¶ 77. As the scan progresses outward, what the Petitioner refers to as “the subset,” Pet. at 35, is determined by the availability of candidate blocks and whether those candidates meet the comparison criteria with the candidates already present in PMV_CANDS, Ex-1004 at ¶¶ 44, 51–66; *see also id.* at Figures 3a–3n; Ex-2001 at ¶ 78.

For instance, when the motion vector for the block at location 3 (“block 3”) is evaluated during Ruser’s scan sequence, the subset of candidates in PMV_CANDS includes candidates from previously evaluated scan locations, such as blocks 1 and 2, assuming those blocks are available and that block 2 has not been excluded due to similarity to block 1. In other words, Ruser’s subset PMV_CANDS is determined before knowing the location or value of the next spatial motion prediction candidate, which in this case is block 3. Petitioner argues the alleged “subset” (here, blocks 1 and/or 2) is based on the location of block 3, which Petitioner alleges corresponds to the “first spatial motion vector prediction candidate.” Pet. at 36. This is incorrect. Ruser’s “subset” is determined prior to knowing the location or value of the (next) spatial motion predication candidate, which in this example is block 3. Ex-2001 at ¶ 79.



Pet. at 36; *see also* Ex. 1003 at ¶ 132.

The motion information for the block being evaluated, in this case, block 3, is then compared to the alleged subset, which includes blocks 1 and 2 in this example, to decide whether block 3's motion vector will be included in PMV_CANDS. Ex-1004 at ¶¶ 62, 71. When Rusert evaluates block 3, all possible pairs of candidates are compared from the candidate list (scan order). Ex-2001 at ¶ 80. That is, comparisons are done with pairs 1/3 and 2/3. *Id.* at fn. 8.

4. Zheng (Ex-1005)

Zheng is a published patent application the Petitioner combines with Rusert as part of its Ground 1. This Preliminary Response focuses on Rusert and the Petition's arguments regarding Rusert in the Rusert/Zheng combination, as Zheng does not add anything material to the disclosure of Rusert. At a high level, however,

Zheng relates to an improvement to a proposed merge list construction process that improves parallelization and reduces the number of required comparisons by eliminating candidates from other prediction units (PU) within the same coding unit (CU). Ex-1005 at ¶¶ 62–63.

5. Similarities between Rusert and Nakamura

Rusert and Nakamura share at least two key similarities. First, both determine what Petitioner refers to as the “subset of spatial motion vector candidates” *before* selecting or determining the “first spatial motion vector prediction candidate.” Second, both Rusert and Nakamura compare the “first spatial motion vector prediction candidate” with each “possible candidate pair.” *See, e.g.*, Ex-1001 at cl. 1, cl. 15, cl. 17; *see also* Ex-2001 at ¶ 85.

Therefore, for the same reasons the Board, in IPR2024-00604 and -00605 (Paper 11), concluded that “the subset S0 has not been sufficiently shown to be based on the location of the block associated with the first spatial motion vector prediction candidate, S1” in Nakamura, the Board should find Rusert does not meet limitations 1[d], 15[d], and 17[d]. IPR2024-00604 Institution Decision (Paper 11) at 56–57.

a. In Nakamura and Rusert, the alleged subsets are determined before the alleged first spatial motion vector prediction candidate is known or confirmed

As Dr. Richardson explains in his declaration, both Rusert and Nakamura determine what the Petitioner refers to as the “subset of spatial motion vector

candidates” *before* determining or selecting what Petitioner calls the “first spatial motion vector prediction candidate.” Ex-2001 at ¶ 86. Dr. Creusere confirmed this in his deposition:

Q. I think I agree with you, that’s certainly true in Rusert, Doctor, that what will be the subset will be based on prior processing done at -- to the point where you reach the -- the first spatial motion vector prediction candidate.

And so to clarify with an example, by the time we reach the -- candidate 3 in Rusert using Figure 3N, we would have done some processing on 1 and 2.

And depending on 1 and 2 and whether they’re the same or sufficiently similar or available, that’s going to help us inform our choice of subset 3.

Do you agree with that?

A. Oh, for Rusert?

Q. Yes.

A. Yeah, I agree with that on -- with respect to Rusert.

Q. Okay. And to some extent -- now I’m going to refer to the Nakamura reference.

That’s -- that’s also true of the Nakamura reference, where we have S0 and S1; and if we’re identifying S1 as the first spatial motion vector candidate, what exists in the subset of S0 will depend on some prior processing before we get to S1 in Nakamura’s order.

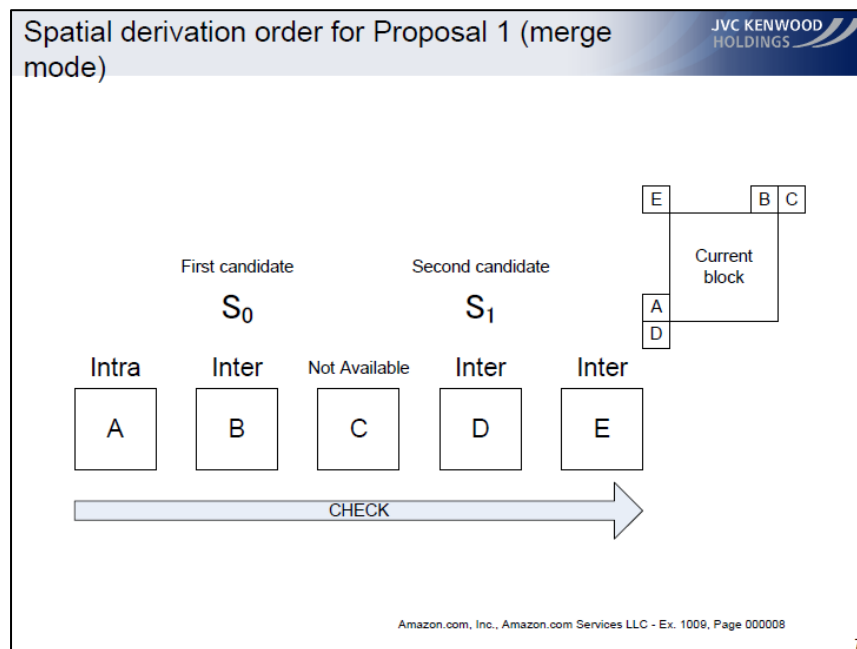
A. I -- I believe it’s accurate, yeah. S0 will be filled first, yeah, and then -- and then -- and we don’t know what’s going to be a priori, right?

So then you’ll -- you’ll have -- you’ll evaluate candidates for S1.

Ex-2010 at 103:20–105:9; Ex-2001 at ¶ 86.

Patent Owner agrees with Dr. Creusere. In both Rusert and Nakamura, the contents of the alleged “subset” are already determined prior to any selection, processing, or evaluation of what Petitioner refers to as the “first spatial motion vector prediction candidate.” Ex-2001 at ¶ 87.

In Nakamura’s approach, S0 (the alleged “subset”) is determined first, without any knowledge or confirmation of what S1 will be. For instance, in the scenario illustrated in Nakamura’s proposal, Ex-1009 at 8, the motion vector associated with neighboring block “B” is selected as the S0 value. Ex-2001 at ¶ 88. Importantly, the “check arrow” in Nakamura clearly shows the order in which A to E are considered. *Id.* at fn. 10.

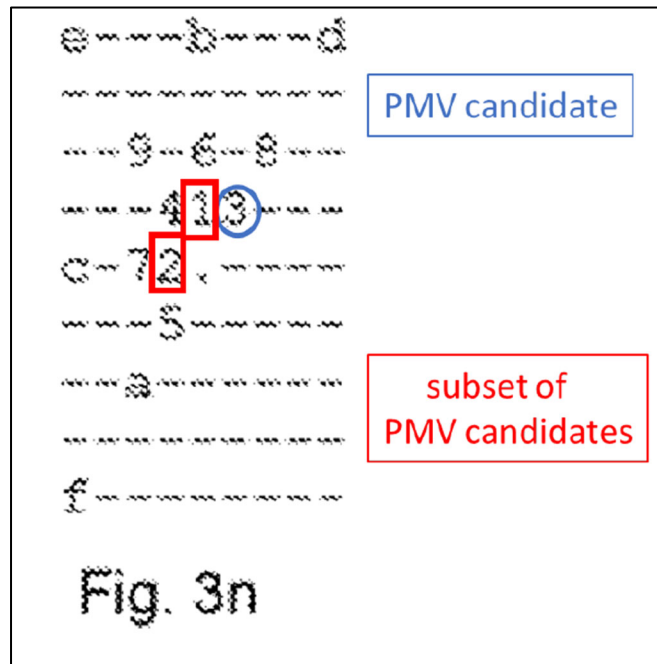


Ex-1009 at 8.

The selection of the motion vector from block B as the value for S0 does not rely on the identity or block location of S1, which—at the time S0 is determined—could be any of C, D, E, or none, depending on availability. This holds true for any potential configuration in Nakamura’s method. In other words, Nakamura’s alleged subset (the value S0) is established without any knowledge of the alleged first spatial motion vector prediction candidate (the value S1) or the location of the block associated with S1. Thus, necessarily, the subset (alleged to be S0) cannot be based on the location of the first spatial motion vector prediction candidate (S1) if S1 is not known or confirmed when the subset (S0) is determined. As Dr. Richardson explains, POSITA would recognize that the first spatial motion vector prediction candidate must be known and confirmed for any subset to be “based on” its location. The Board correctly highlighted this point in its Institution Decision for the IPRs challenging the related ’714 Patent, noting that “S0 is already selected regardless of what the selection of S1 thereafter might be. The subset S0 does not change depending on the later choice of S1.” IPR2024-00604 Institution Decision (Paper 11) at 56; Ex-2001 at ¶ 89.

As for Rusert, below is an annotated version of Rusert’s Figure 3n from page 36 of the Petition and Paragraph 132 of Dr. Creusere’s declaration. Pet. at 36; Ex-

1003 at ¶ 132. Here, blocks ‘1’ and ‘2’ are the alleged subset, while block ‘3’ is the alleged first spatial motion vector prediction candidate. Ex-2001 at ¶ 90.



Pet. at 36; *see also* Ex-1003 at ¶ 132.

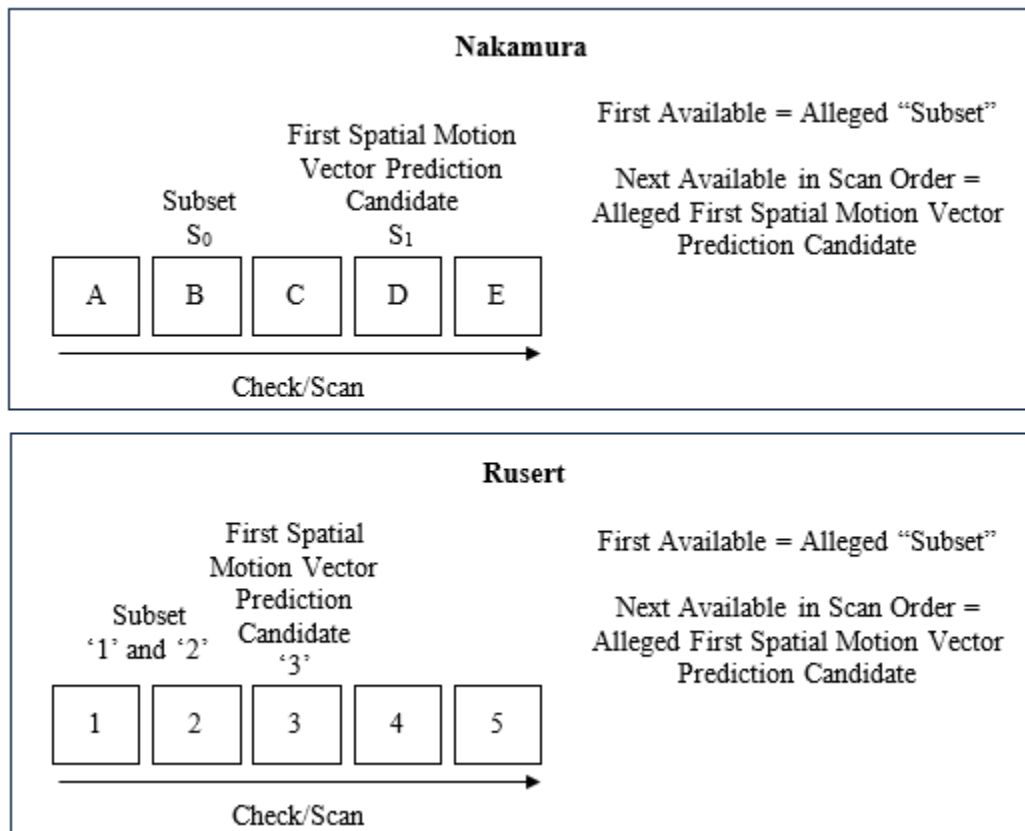
The content of Rusert’s alleged subset depends on the availability of blocks processed up to that point. For instance, if the motion vector of block ‘1’ is unavailable, Ex-1004 at ¶ 54 (providing examples where blocks may be unavailable due to coding order or lack of motion vector); *see also supra* Section II(C)(1)(a), the alleged subset will consist of just the motion vector of block ‘2’. The alleged subset also depends on a comparison between the motion vectors of blocks ‘1’ and ‘2’, assuming both are available. If both blocks are available and their motion vectors

are sufficiently similar or identical, the alleged subset will consist of just block ‘1’.
Ex-2001 at ¶ 91.

By the time Rusert begins processing to determine whether the motion vector for block ‘3’ is available and whether to add it to PMV_CANDS, the alleged subset has already been established. Rusert does not know if block ‘3’ or any associated motion vector is available when the alleged subset is determined. If block ‘3’ is unavailable (e.g., it is intra-coded), and if blocks ‘1’ and ‘2’ are part of the subset, the next available candidate, such as block ‘4’, ‘5’, or another later block, will be compared to blocks ‘1’ and ‘2’. Therefore, in Rusert, the alleged subset (which could be block ‘1’ or blocks ‘1 and 2’ in this case) has already been selected, regardless of which block (such as block ‘3’, ‘4’, or any later one) is chosen as the first spatial motion vector prediction candidate. The subset does not change based on which candidate is available and later selected for evaluation. *Id.* at ¶ 92.

Dr. Richardson’s figure (provided below) demonstrates how in both Nakamura and Rusert, the alleged subsets are established before the first spatial motion vector prediction candidate is identified or confirmed. In Nakamura, S0 is assigned the motion vector of block B before a suitable motion vector for candidate S1 is determined. Similarly, in Rusert, PMV_CANDS is established as ‘1’, ‘1, 2’, or ‘2’ before deciding whether to add the next available block’s motion vector to PMV_CANDS (i.e., the (next) potential candidate referenced by the Petitioner

cannot possibly meet the claim requirements for the “first spatial motion prediction candidate”). *Id.* at ¶ 93.



b. In Nakamura and Rusert, comparisons are performed with all possible candidate pairs

Both Rusert and Nakamura compare what Petitioner alleges to be the “first spatial motion vector prediction candidate” with each “possible candidate pair” from the set of motion vector prediction candidates. *See, e.g.*, Ex-1001 at cl. 1, cl. 15, cl. 17.

In Nakamura, the first available motion vector prediction is added to the merge list as S₀. Nakamura then scans for the next available candidate, which, once

found, is labeled S1. S1 is always compared to S0. Given Nakamura’s approach, the only possible pair of spatial motion vector prediction candidates is S1 and S0.⁹ See, e.g., Ex-1009 at 8; Ex-2001 at ¶ 95.

Below is a highlighted excerpt from Nakamura’s JCTVC-F419 proposal, which explains that the only possible pair of spatial motion vector prediction candidates is S1 and S0. Ex-1007 at 2; Ex-2001 at ¶ 96.¹⁰

Table 2 Comparison between HM3.0 and proposed technique for merge mode		
	HM3.0	Proposal 1
The number of spatial candidates	4 in 4 [positions]	2 in 5 [positions]
Spatial derivation order	A, B, C, D	A, B, C, D, E
The number of times of comparison of redundant candidates in the spatial derivation process	0 [time]	0 [time]
The number of temporal candidates	1	1
Merging candidate list order	A, B, Col, C, D	S ₀ , S ₁ , Col
The number of times of comparison in the removal process	10 [times] (A vs B, Col, C, D, B vs Col, C, D, Col vs C, D, and C vs D)	3 [times] (S ₀ vs S ₁ , S ₀ vs Col, and S ₁ vs Col)

Notes:

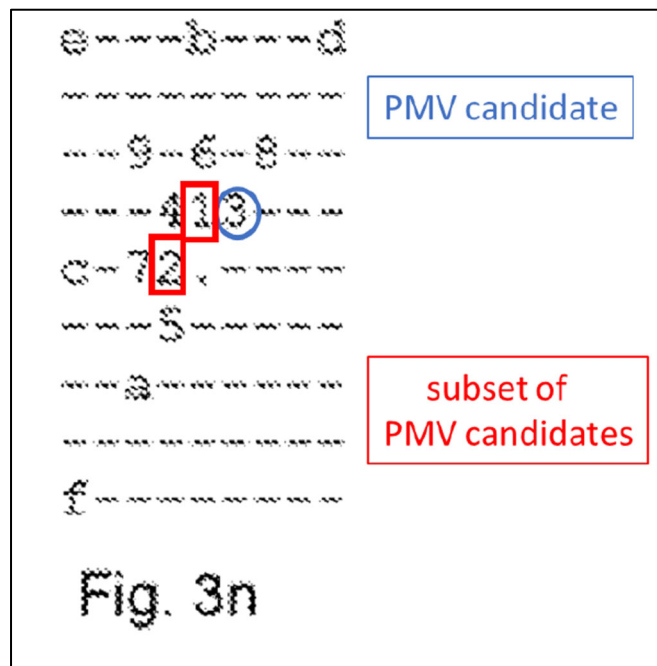
S₀: The first spatial candidate found in the spatial derivation process

S₁: The second spatial candidate found in the spatial derivation process

⁹ This holds true in any scenario, whether S0 and S1 constitute the set of “candidates” or A, B, C, D, and E are regarded as the set of “candidates.” Ex-2001 at fn. 11.

¹⁰ As Dr. Richardson explains, the abbreviation “Col” refers to a “collocated” block, which is a temporal motion vector prediction candidate and not a “spatial motion vector prediction candidate.” *Id.* at ¶ 96.

Rusert follows a similar approach. Looking at Figure 3n, the first available candidate in the scan order is automatically added to the PMV_CANDS list. Ex-1004 at Figure 3n. For instance, if block 1 is available, ‘1’ is added to the PMV_CANDS list. Rusert then examines the next location in scan order to determine whether a subsequent available candidate is present. If block 2 is available, ‘2’ is chosen as the next candidate and compared with ‘1’. This comparison involves all possible candidate pairs at this stage in Rusert's process to decide whether ‘2’ should be added to the PMV_CANDS list. Ex-2001 at ¶ 97.



Pet. at 36; *see also* Ex-1003 at ¶ 132.

Rusert continues this process until the scan order is complete or the maximum list size is reached.¹¹ For instance, if ‘3’ is available, it becomes the next candidate. If the PMV_CANDS list already contains ‘2’ and ‘1’, ‘3’ will be compared to both ‘2’ and ‘1’.¹² Again, this step involves comparing all possible candidate pairs to decide whether ‘3’ should be added to the list. Ex-2001 at ¶ 98.

E. POSITA

PO has applied Petitioner’s POSITA for the sake of this Response. Pet. at 19. This Response does not depend on this skill level. PO reserves the right to argue in

¹¹ According to the Petitioner’s interpretation of Rusert, each iteration in the scan involves selecting a new first spatial motion prediction candidate. In Rusert, for every subsequent iteration, the next available candidate in the scan order becomes the new “first spatial motion prediction candidate.” Ex. 2001 at fn. 12

¹² If available, ‘3’ may be compared to either ‘1’, ‘2’, or both, depending on the availability and/or similarity of ‘1’ and ‘2’. Regardless of the situation, Rusert specifies a comparison of all possible candidate pairs to decide whether to add a candidate to the PMV_CANDS list. For instance, if PMV_CANDS only contains ‘2’ when ‘3’ is evaluated, then the only valid candidates for comparison are ‘2’ and ‘3’, and the comparison of ‘3’ with ‘2’ constitutes a comparison of all possible candidate pairs. *Id.* at fn. 13.

favor of different level of skill should trial be instituted.

F. Claim Construction

Petitioner takes a position on the meaning of three terms. Only the Petitioner's treatment of the term "the block associated with the first spatial motion vector prediction candidate" appears to be relevant to the Grounds for purposes of this Preliminary Response. However, Patent Owner may present additional arguments as to other terms if this proceeding is instituted.

In the Institution Decision for the related '714 Patent, the Board found that Petitioner's interpretation that "the block" in limitation 1[b] means the "current block," as in the "block of pixels" introduced in limitation 1[a] as unpersuasive. IPR2024-00604 Institution Decision (Paper 11) at 16–18, 30–33; Pet. at 20. Patent Owner agrees with the Board's interpretation of this term and urges the Board to similarly reject Petitioner's construction of "the block" in limitations 1[d], 15[d], and 17[d] of the '833 Patent.

In the Institution Decision for the related '714 Patent, the Board accurately interpreted the phrase "determine a subset of spatial motion vector prediction candidates based on the location of the block associated with the first spatial motion vector prediction candidate" to mean that the subset is determined based on the location of the block with which the first spatial motion vector prediction candidate is associated. IPR2024-00604 Institution Decision (Paper 11) at 16–18. The same

interpretation should be applied to the '833 Patent. For instance, in Figure 9 of the '833 Patent, block "901" is associated with the first spatial motion vector prediction candidate, "A0." Similarly, when the motion vectors associated with other neighboring blocks (e.g., A1, B0, B1, and B2) are considered as potential motion vector prediction candidates, the respective motion vectors are considered to be the "first spatial motion vector prediction candidate" of the claims.

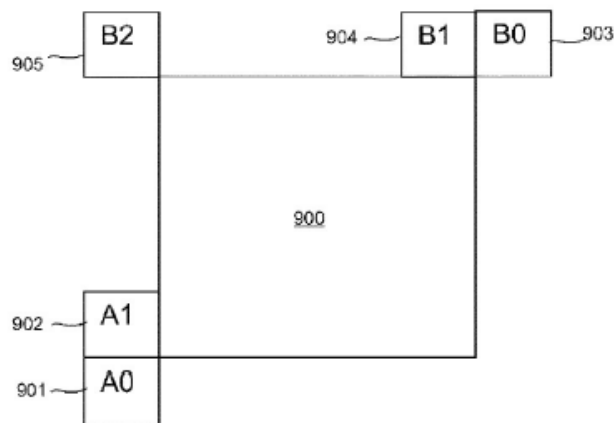


Fig. 9

Ex-1001 at Figure 9. Petitioner argues that the "based on the location of the block associated with the first spatial motion vector prediction candidate" limitation should be interpreted to mean based on the location of the encoded block of pixels introduced in limitations 1[a], 15[a], and 17[a]. Pet. at 20. Meaning, Petitioner contends that the claim language "the block associated with the first spatial motion vector prediction candidate" should be interpreted to refer to block 900 in Figure 9

(above), rather than to one of the blocks corresponding to the spatial motion vector prediction candidates A0, A1, B0, B1, or B2. Ex-2001 at ¶ 43.

The only argument Petitioner put forward for its theory is that “[d]uring prosecution the Examiner applied the first interpretation, with ‘the’ block as the ‘current block.’” Pet. at 20. The Board, in IPR2024-00604 and -00605 (Paper 11), found Petitioner’s argument unconvincing, stating that “[c]laim construction is a question of law, and we are not bound by an earlier construction of an Examiner who applied a different standard for claim construction in a parent application for a similar claim term.” IPR2024-00604 Institution Decision (Paper 11) at 18.

Petitioner’s interpretation reads out the words “associated with the first spatial motion vector prediction candidate” from the limitation. The ’833 Patent makes clear that the candidate motion vectors for the current frame use either “one or more . . . motion vectors of one or more neighbour blocks . . . of the current block in the same frame and/or co-located blocks . . . of the current block in one or more other frames[.]” Ex. 1001 at 12:39-43. That is, these are motion vectors associated with other blocks, rather than the current block (which when processed lacks a motion vector), to define a list of suitable motion vector candidates for the current block, as would be understood by a POSITA. As Dr. Richardson explains, a POSITA would readily understand that “the block associated with the first spatial motion vector prediction candidate” refers to the blocks labeled 901 through 905 or A0 through B2

in Figure 9 above. Petitioner's interpretation fails to provide any real meaning to the phrase "associated with the first spatial motion vector prediction candidate" in the claim language. Ex-1001 at cl. 1, cl. 15, cl. 17; Ex-2001 at ¶ 44.

In addition to the Board's determination, in IPR2024-00604 and -00605 (Paper 11), Petitioner and Dr. Creusere's allegations regarding the Examiner's interpretation of the claims are wrong as Dr. Richardson explains in his declaration. Ex-2001 at ¶ 45. For instance, Dr. Creusere alleges that the Examiner interpreted "based on the location of the block associated with the first spatial motion vector prediction candidate" as referring to "based on the location of the 'current block.'" Ex-1003 at ¶ 46 (citing Ex-1002 at 000198). The only evidence Dr. Creusere cites to support this is the Examiner's Non-Final Office Action and its supposed adoption of Petitioner's interpretation and the applicant's supposed non-rebuttal of that interpretation. *Id.* However, as explained below, the prosecution history supports the interpretation provided by Patent Owner and the Board, not the Petitioner and Dr. Creusere's interpretation. Ex-2001 at ¶ 45.

The section of the page in the prosecution history Dr. Creusere references, Ex-1002 at 000198, is highlighted below. In this part of the prosecution history, the Examiner addresses the phrase "based on the location of the block associated with the first spatial motion vector prediction candidate." The Examiner points to Tai, Ex-2007, and defines the subset "by selecting one of the $\overrightarrow{PMV}$ *from MVs of*

neighboring blocks,” Ex-1002 at 000198 (emphasis added); Ex-2001 at ¶ 46.

determining a subset (*i.e.* $CS^i(\vec{X}, t) = \{\vec{V} | \vec{V} = \overrightarrow{PMV}^i(\vec{X}) + \vec{U}, \vec{U} \in US^i\}$ - equation 2) of spatial motion vector predictions based on the location of the block associated with the first spatial motion vector prediction candidate (*i.e.* by selecting one of the $\overrightarrow{PMV}$ from MVs of neighboring blocks, a subset of $CS^i(\vec{X}, t)$ is defined for different linear combination of that PMV and $\vec{U} \in US^i$);

Ex-1002 at 000198 (highlighting added).

Below is a highlighted excerpt from Tai including the equation cited by the Examiner. Notably, $\overrightarrow{PMV}$ is “chosen from the MVs of the neighboring blocks.” See Ex-2007 at Figure 3 (illustrating exemplary patterns of neighboring blocks). Each neighboring block has an associated motion vector that may be selected as “ $\overrightarrow{PMV}$ ”. This is what the Examiner referred to when stating “by selecting one of the $\overrightarrow{PMV}$ from MVs of neighboring blocks.” Ex-1002 at 000198. The Examiner did not point to a PMV selected from the motion vector of the current block, as Petitioner and Dr. Creusere seem to suggest. As Dr. Richardson explains in the context of the highlighted excerpt from Tai below, Petitioner and Dr. Creusere’s interpretation is illogical, as the purpose of Tai’s method is to address the situation where the current block lacks a motion vector and therefore requires a predicted motion vector. Ex-2001 at ¶ 47.

The candidate vector set $CS^i(\vec{X}, t)$ is comprised by a single PMV and a set of update vectors. Let $\vec{X}$ represent the block location and let t be the frame number. The candidate vector set for this particular block in the i^{th} pass are then defined as

$$CS^i(\vec{X}, t) = \left\{ \vec{V} \mid \vec{V} = \overrightarrow{\text{PMV}}^i(\vec{X}) + \vec{U}, \vec{U} \in US^i \right\} \quad (2)$$

where $\overrightarrow{\text{PMV}}^i(\vec{X})$ is the PMV of block $\vec{X}$ and is chosen from the MVs of the neighboring blocks and US^i is a set of update vectors. Every motion vector $\vec{V}$ in the candidate vector set is comprised by a single PMV and a update vector $\vec{U}$ selected from update vector set US^i .

Ex-2007 at 3 (highlighting added).

Further, the '833 Patent makes clear that the candidate motion vectors for the current frame use either “one or more ... motion vectors of one or more neighbor blocks ... of the current block in the same frame and/or co-located blocks ... of the current block in one or more other frames[,]” i.e., these are motion vectors associated with other blocks, rather than the current block, to define a list of suitable motion vector candidates for the current block, as would be understood by a POSITA.¹³

¹³ A POSITA would readily understand that “the block associated with the first spatial motion vector prediction candidate” refers to the blocks labeled 901 through 905 or A0 through B2 in Figure 9 above. Petitioner essentially disregards the phrase

G. Claim Listing

For the sake of this analysis, PO will use Petitioner's limitation labels provided in the petition's claim appendix. Pet. at 95-107.

III. ARGUMENT

A. Petitioner Has Not Established A Reasonable Likelihood That The Challenged Claims Are Unpatentable In Light Of Ground 1

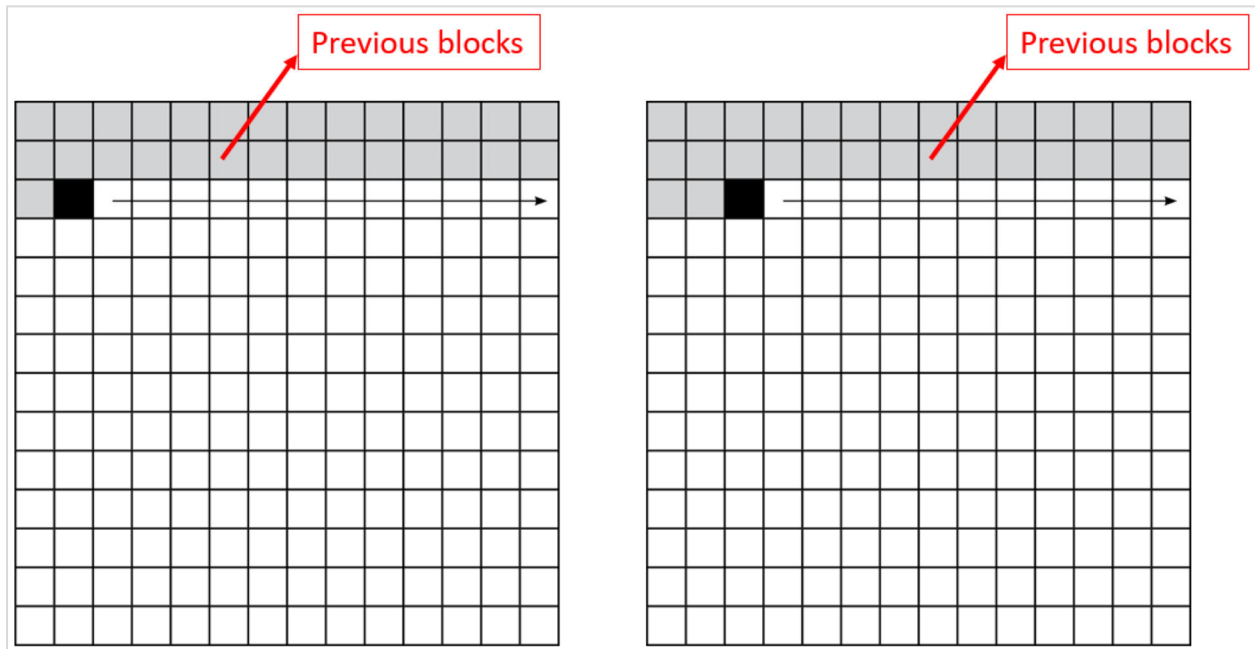
In Ground 1, Petitioner relies on Rusert to satisfy all limitations of the independent claims. Pet. at 21. Although Petitioner cites Zheng for H.265 concepts that are recited in the challenged claims (such as prediction units and merge lists), none of Petitioner's arguments challenging the validity of the claims relate to those concepts. Accordingly, the failure of Rusert to teach the below limitations dooms the Petition. The Petition therefore fails to establish a reasonable likelihood of success for Ground 1.

1. Petitioner's Ground 1 argument fails because it does not teach "determining a set of spatial motion vector prediction candidates for the block of pixels" as required by 1[b], 15[b], and 17[b]

The Petition relies on Rusert to satisfy the "determining a set of spatial motion vector prediction candidates for the block of pixels" limitations of the challenged

"associated with the *first spatial motion vector prediction candidate*" from the claim language. Ex-1001 at cl. 1, cl. 15, cl. 17.

independent claims. Pet. at 28. The Petition states that, in Ground 1, “the set of spatial motion vector prediction candidates encompasses all previously encoded blocks,” i.e., all previously coded vectors for the current frame. Pet. at 29. The petition illustrates this statement with the diagram below:



Contrary to the Petitioner’s assertion, this inclusion of all previously coded blocks in the frame shows that no “determining of a set of spatial motion vector prediction candidates” is performed “for the block of pixels.” Ex-2001 at ¶ 101. If the set is everything, it is either never determined, or impossible not to satisfy, effectively reading the limitation out of the claim. *Id.* at ¶ 102.

The plain language of the claims also requires order between the performance of limitations 1[b], 1[c], and 1[e]. *Id.* at ¶ 103. The set must be “determined” before the “first spatial motion vector prediction candidate” is selected from the set, and a

vector cannot be part of a “possible candidate pair from the set” until that vector has been determined to be in the set. *Id.*

However, in Rusert a block is not inspected for a PMV (and if so added to the “set of spatial motion vector prediction candidates”) until the block (i.e., a block in a future position) is reached in Rusert’s scan order. *Id.* at ¶ 104; Ex-1004 at ¶¶ 48–49, 54. Accordingly, in Rusert whether a position in scan order contains a motion vector (and thus whether the motion vector is part of the set) is not determined until a position is reached in scan order. Ex-2001 at ¶ 104. In Rusert, the set is therefore never determined until PMV_CANDS is full or available candidates are exhausted, and this is not determined until after the “first motion vector prediction candidate” is selected and the comparison is conducted. As these steps must occur after the set is determined, Rusert cannot teach limitations 1[b], 15[b], or 17[b]. *Id.* at ¶¶ 105, 106.

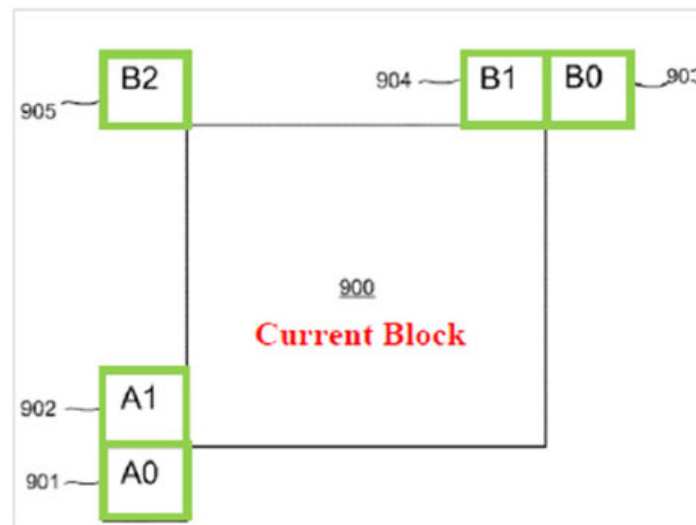
2. Petitioner’s Ground 1 argument fails because it does not teach “determining a subset of spatial motion vector prediction candidates based on a location of the block associated with the first spatial motion vector prediction candidate” as required by 1[d], 15[d], and 17[d]

As addressed above, the Petitioner relies only on Rusert’s teachings to satisfy the “determining a subset of spatial motion vector prediction candidates based on a location of the block associated with the first spatial motion vector prediction candidate” of limitations 1[d], 15[d], and 17[d]. Pet. at 35–41 (citing only Rusert for

1[d]), 62–63 (citing back to 1[d] for 15[d] and 17[d]). Accordingly, Rusert’s failure to satisfy this limitation dooms Petitioner’s argument on Ground 1.

Petitioner’s principal argument concerning 1[d] relies on Petitioner’s theory of “the block” addressed in Section II.F above. Petitioner misinterprets this limitation, applying a meaning of “the block” inconsistent with both the ’833 Patent and its prosecution history. Ex-2001 at ¶¶ 111–114. As appropriately interpreted, limitation 1[d] requires the subset of the claim to be determined based on the block from which the first spatial motion vector prediction candidate is derived. *Id.*

The ’833 Patent concerns the construction of a merge list from a set of spatial motion vector prediction candidates obtained from blocks neighboring the current block (the “prediction unit” included in the “block of pixels” of the claims). Ex-1001 at 13:13–19. Fig. 9 of the ’833 Patent is annotated below to show the current block and the candidates, in the case where the block of pixels includes only one prediction unit.



Ex-1001, Figure 9 (annotated to show the set of motion vector prediction candidates A0, A1, B0, B1 and B2)

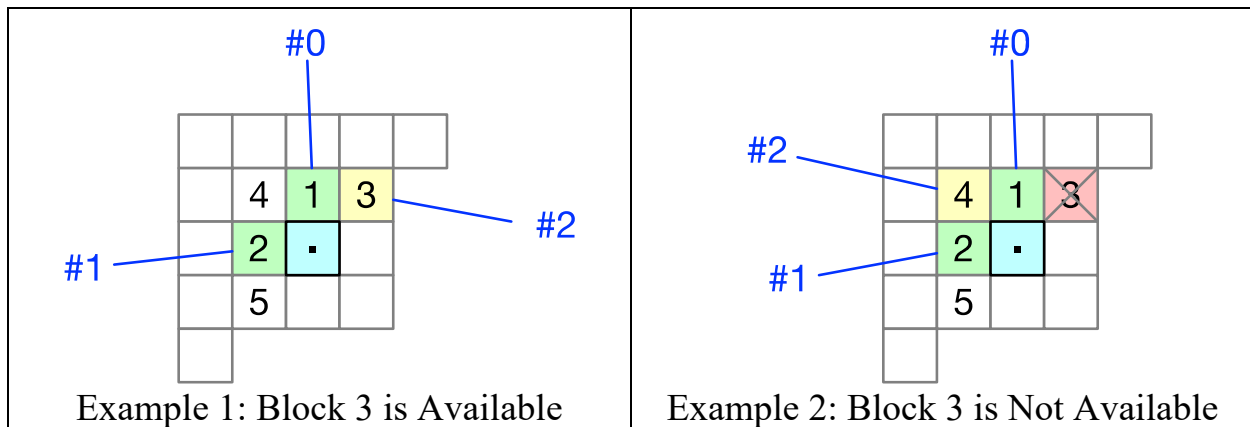
A POSITA would understand the challenged claims of the '833 Patent to relate to the construction of a merge list from the labeled candidates using a limited number of comparisons. Pertinent to limitation 1[d], a POSITA would understand each candidate (A0, A1, B0, B1, and B2) to be compared to only a determined subset of the other candidates, and that this determined subset would depend on the location of block associated with the selected candidate (A0, A1, B0, B1, and B2) rather than the location of the current block (900). Ex-2001 at ¶¶ 111–113. In addressing Petitioner's similar position in Petitioner's prior challenges to the related '714 Patent, the Board adopted Patent Owner's interpretation and rejected Petitioner's interpretation.¹⁴

¹⁴ IPR2024-00604 Paper 11 at 18; IPR2024-00605 Paper 11 at 17.

In the Petition’s treatment of Rusert, the “subset” is the PMV_CANDS list determined from the previously traversed blocks in Rusert’s scan order. Pet. at 35–41. This subset is determined prior to the selection of the first motion vector prediction candidate of limitation 1[c], and therefore cannot be “based on a location of the block associated with the first spatial motion vector prediction candidate” as required by 1[d]. Ex-2001 at ¶¶ 119–124. Instead, the PMV_CANDS list is based upon a series of comparisons and availability checks made *before* the first spatial motion vector prediction candidate of limitation 1[c] is selected.

As a result, the “subset” identified in the Petition can be different at the same “location of the block associated with the first spatial motion vector prediction candidate” or can be the same for different “location[s] of the block associated with the first spatial motion vector prediction candidate.” Ex-2001 at ¶¶ 116–124.

For example, if the selected “first spatial motion vector prediction candidate” under the Petition’s application of Rusert were the candidate from the block labeled “3” below, the current PMV_CANDS list could be empty, include 1, include 2, or include 1 and 2. If Rusert’s availability check on 3 fails (there is no available MV from 3), then block location 4 would have the same possible PMV_CANDS list at the candidate from block 3. *Id.*



Put another way, the “determining” that occurs in the construction of PMV_CANDS through scan order “1” and “2” does not depend on the position or existence of a candidate at scan order 3. Whether one, both, or neither is represented in PMV_CANDS is fixed before the third position in scan order is reached. As a result, PMV_CANDS following scan order position “2” is not “based on” scan order position 3. As a result, Rusert cannot satisfy this limitation, and Petitioner’s first Ground is unlikely to succeed.

3. Petitioner’s Ground 1 argument fails because it does not teach “comparing . . . without making a comparison of each possible candidate pair from the set of spatial motion vector prediction candidates,” as required by 1[e], 15[e], and 17[e]

As addressed above, Petitioner relies only on Rusert’s teachings to satisfy the “comparing . . . without making a comparison of each possible candidate pair from the set of spatial motion vector prediction candidates” of limitations 1[e], 15[e], and 17[e]. Pet. at 41–45 (citing only Rusert for 1[e]), 62–63 (citing back to 1[e] for 15[e])

and 17[e]). Accordingly, Ruser's failure to satisfy this limitation dooms Petitioner's argument on Ground 1. Ex-2010 at ¶ 125.

As addressed in Section III.A.1 above, the Petitioner does not present a cogent theory as to what the set is that is being "determine[ed]." If the set is all motion vectors from previously coded blocks in Ruser's scan order, then the set is not determined before the "first motion vector prediction candidate" is selected (limitation 1[c]) because the availability check in Ruser is performed as part of the scan, and limitation 1[b] is not satisfied. Further, before the availability check, even if an unchecked motion vector from a later point in the scan order (i.e., a future scan order position) could be considered part of the set, it cannot yet be part of a "possible candidate pair" because its existence is unknown to Ruser's scan order system. *Id.* at ¶¶ 129–135.

If, on the other hand, the "set" for the "first motion vector prediction candidate" only includes those candidates in the scan order up to the block associated with "first motion vector prediction candidate," Ruser's system teaches that the motion vector for each "first motion vector prediction candidate" is compared to all prior candidates, and thus all possible candidate pairs including the "first motion vector prediction candidate" are compared. If a prior scan position candidate is on the PMV_CANDS list, its motion information is compared with the motion information for the "first motion vector prediction candidate." If a prior scan position

candidate is not on the PMV_CANDS list because its motion information was redundant with the motion information for another candidate already on the PMV_CANDS list (i.e., all redundancies are removed), then its motion information is still compared, indirectly, to the motion information for the “first motion vector prediction candidate.” *Id.* at ¶¶ 133–135.

As a result, whether the “set of spatial motion vector prediction candidates” includes potential candidates from future scan order positions or not in Petitioner’s theory for Ground 1, Rusert cannot satisfy limitation 1[e] or the corresponding limitations 15[e] or 17[e].

B. Petitioner Has Not Established A Reasonable Likelihood That The Challenged Claims Are Unpatentable In Light Of Ground 2.

In Ground 2, Petitioner relies on Nakamura to satisfy limitations 1[d], 1[e], 15[d], 15[e], 17[d], and 17[e] of the independent claims. Pet. at 73–75. Although Petitioner cites WD4 for some aspects of these limitations (e.g., that “motion information” includes “motion vectors” and “reference indices,” Pet. at 75), these are not material to the substantive arguments raised for 1[d], 1[e], 15[d], 15[e], 17[d], and 17[e] below. Accordingly, Nakamura’s failure to teach limitations 1[d], 1[e], 15[d], 15[e], 17[d], and 17[e] dooms Ground 2.

Separately, Ground 2 consists of a meeting contribution (Nakamura) and a draft standards document from after that meeting reflecting a rejection of the

substance relied upon by Petitioner (WD4). Ground 2 therefore seeks to combine two references where one reference has already rejected the inclusion of the other. A POSITA would not be motivated to combine these references, so Ground 2 also fails for this reason.

Separately, the PTAB has already concluded that WD4 does not qualify as a printed publication, and is therefore ineligible to use as prior art in an IPR. The facts here are no different than in the PTAB's prior treatment of WD4. *See Samsung Elecs. Co. v. Infobridge Pte. Ltd.*, 929 F.3d 1363 (Fed. Cir. 2019). Ground 2 also fails because at least one of the references included in the asserted combination is not prior art.

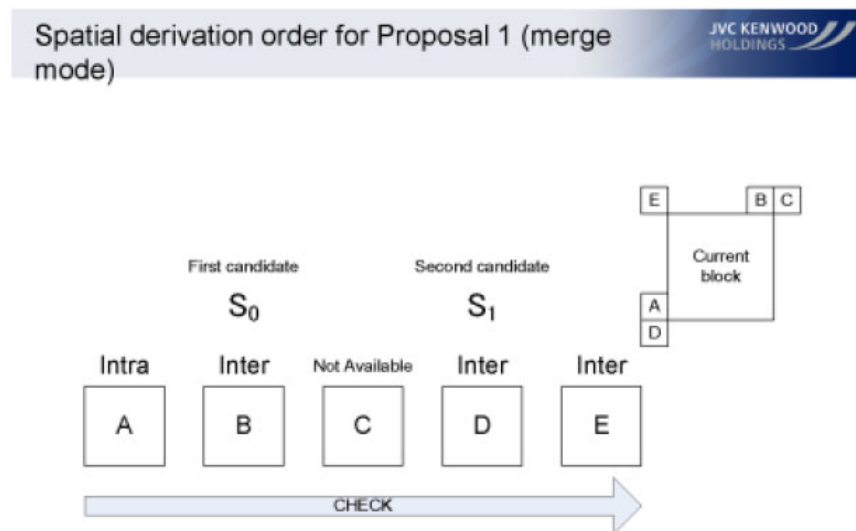
Finally, Ground 2 consists of prior art references that were actually considered during prosecution of the challenged claims, so institution should be denied under *Advanced Bionics* and § 325(d).

- 1. Petitioner's Ground 2 argument fails because Nakamura and WD4 do not teach "determining a subset of spatial motion vector prediction candidates based on the location of the block associated with the first spatial motion vector prediction candidate," as required by 1[d], 15[d], and 17[d]**

Petitioner relies on Nakamura for claim limitation "determining a subset of spatial motion vector prediction candidates based on the location of the block associated with the first spatial motion vector prediction candidate". Pet. at 73–74.

In the theory presented by the Petitioner, the “first spatial motion vector prediction candidate” is “S1.” Pet. at 68–69; Ex-2001 at ¶ 136.

Nakamura’s method identifies S0 then S1 by evaluating locations (A, B, C, D, E) in the order of the “check” arrow in the figure below. The first available motion vector is designated as candidate S0, and the second available motion vector is designated as candidate S1. *Id.*



Ex-1009, 8

Nakamura’s method for identification of candidates and subsequent comparisons is fundamentally different from the challenged claims. Elements 1[c] and 1[d] have a logical sequence, as one cannot “determine a subset . . . based on a location . . . associated with the first spatial motion vector prediction candidate” in claim limitation 1[d] until a “first motion vector prediction candidate” has been selected. Ex-1001 at cl. 1, cl. 15, cl. 17; Ex-2001 at ¶ 137. In contrast to the ’833

Patent, Nakamura adds two candidates, S0 and S1, to its merge list based on availability. As shown in the Figure above, S0 (the first candidate added to the list in Nakamura and alleged by the Petitioner to be the claimed “subset”) corresponds to the “B” block because it is the first inter-coded block encountered in the example. S1 (the second candidate added to the list and the candidate the Petitioner alleges is the “first spatial motion vector prediction candidate”) corresponds to block “D”. Nakamura skips over “C” because it is unavailable in the example. With this understanding, Petitioner’s arguments are flawed for at least the following reasons. *Id.*

S0 (the alleged “subset”) is not determined based on the location of, nor is it related to, S1 (the alleged “first spatial motion vector prediction candidate”). There is no connection between the selection of the motion vector of block B as the alleged “subset” and, for example, the location of block D in the bottom non-adjacent corner. Instead, block B’s motion vector is considered the “subset” in Petitioner’s interpretation of Nakamura simply because B is the first inter-coded block with an available motion vector. Furthermore, by the time S0 is being considered as the alleged “subset” relevant to S1, S0 has already been determined. As a result, the alleged determination of the subset is unrelated to any characteristics of S1 (including its location). *Id.* at ¶ 138.

Moreover, Petitioner relies on S1 as the “first spatial motion vector prediction candidate” likely because S0 is added to the list without any comparison, meaning S0 cannot possibly meet the requirements of the claims. Ultimately, neither S0 nor S1 can fulfill the claimed “first spatial motion vector prediction candidate.” This is because S0 is selected based on the availability (not location) of the neighboring blocks and is automatically added to the merge list, and S1 is then chosen as the next available candidate after S0. Additionally, when S0 and S1 are compared (the only comparison of spatial motion vector prediction candidates that occurs), only S1 can be removed from the merge list if both S0 and S1 have the same motion vector information. *Id.* at ¶ 139.

As a result, Petitioner’s claimed S0 subset cannot be determined based on anything related to S1 (including location of the associated block). At the time Nakamura determines S0, as S1 has not yet been derived and does not exist at this stage. Nakamura therefore fails to render obvious at least elements 1[d], 1[e], 15[d], 15[e], 17[d], and 17[e]. *Id.* at ¶¶ 140, 141.

2. **Petitioner’s Ground 2 argument fails because Nakamura and WD4 do not teach “comparing motion information of the first spatial motion vector prediction candidate with motion information of the spatial motion vector prediction candidate in the determined subset of spatial motion vector prediction candidates without making a comparison of each possible candidate pair from the set of spatial motion vector prediction candidates,” as required by 1[e], 15[e], and 17[e]**

Petitioner alleges this limitation is found in Nakamura. However, Nakamura does not teach “comparing motion information of the first spatial motion vector prediction candidate with motion information of the spatial motion vector prediction candidate in the determined subset of spatial motion vector prediction candidates without making a comparison of each possible candidate pair from the set of spatial motion vector prediction candidates,” as required by the claims. *See, e.g.,* Ex-1001 at cl. 1, cl. 15, cl. 17.

First, Petitioner cites to the table below, where Nakamura proposal is compared against HM3.0 (WD3).

Table 2 presents the comparison between HM3.0 and proposed technique for merge mode.

Table 2 Comparison between HM3.0 and proposed technique for merge mode		
	HM3.0	Proposal 1
The number of spatial candidates	4 in 4 [positions]	2 in 5 [positions]
Spatial derivation order	A, B, C, D	A, B, C, D, E
The number of times of comparison of redundant candidates in the spatial derivation process	0 [time]	0 [time]
The number of temporal candidates	1	1
Merging candidate list order	A, B, Col, C, D	S ₀ , S ₁ , Col
The number of times of comparison in the removal process	10 [times] (A vs B, Col, C, D, B vs Col, C, D, Col vs C, D, and C vs D)	3 [times] (S ₀ vs S ₁ , S ₀ vs Col, and S ₁ vs Col)

Notes:
S₀: The first spatial candidate found in the spatial derivation process
S₁: The second spatial candidate found in the spatial derivation process

Ex-1007 at § 2.2.1, Table 2.

Regarding Nakamura’s Proposal 1, Petitioner is mistaken in suggesting that fewer than all possible candidate pairs are compared. Pet. at 75. The Petitioner appears to base this incorrect conclusion on Nakamura’s omission of comparisons between each of the A-E neighbors, which occurs because only “2 out of 5” neighbors are used as “spatial candidates.” *Id.*; *see also* Ex-1007 at Table 2; Ex-2001 at ¶ 143. However, Petitioner overlooks whether Nakamura compares every “possible candidate pair” of spatial motion vector prediction candidates. Nakamura does, in fact, compare each “possible candidate pair.” Without question, Nakamura can only compare spatial candidates S₀ and S₁ and always does so. Therefore, with respect to the alleged first spatial motion vector prediction candidate ‘S₁’, Nakamura consistently compares all possible candidate pairs. Ex-2001 at ¶ 143.

Accordingly, Nakamura fails to render obvious at least claim elements 1[e], 15[e], and 17[e]. Petitioner does not rely on WD4 for this limitation, therefore the Nakamura/WD4 combination fails to render obvious at least claim elements 1[e], 15[e], and 17[e]. Pet. at 74–75, 88.

3. Petitioner’s Ground 2 argument fails because a POSITA would not have been motivated to combine Nakamura with WD4

Although Nakamura and WD4 are both directed to the ongoing development of improved video coding standards, the suggestion by Petitioner that a POSITA would therefore be motivated to combine the two documents is unfounded. Nakamura and WD4 include competing techniques for building a merge list and cannot be combined without omitting aspects of one or the other. Ex-2001 at ¶ 146.

Petitioner suggests that once Nakamura was proposed, it would have been obvious to a POSITA to combine it with WD4 or, indeed, any working draft of the HEVC standard. Pet. at 63–65. This is incorrect, as demonstrated by WD4 itself. Petitioner agrees that Nakamura was originally proposed as an improvement to Working Draft 3 of the HEVC standard, but fails to address the reality that Nakamura’s proposed simplification to the derivation method for merge mode candidate was expressly evaluated by experts in the field and then *not* included in Working Draft 4. *Id.*; Ex-2001 at ¶ 145.

Rather than following the suggestion of Nakamura, which “tries to reduce the number of candidates in the spatial derivation process,” WD4 reflects a decision not to reduce the number of candidates during the spatial derivation process, instead adopting a technique that more strongly resembles the same HM3.0 technique with which Nakamura contrasts its proposed technique. *See* Ex-1007, Abstract; *compare* Ex-1007 at § 2.2.1 *with* Ex-1010 at § 8.4.2.1.1; Ex-2001 at ¶ 146.

JCTVC-F744-v3 (“F744”) details the JCTVC’s evaluation of the Nakamura proposal. Despite Petitioner’s assertion to the contrary, the unification of the spatial neighbor locations used for merge mode and Motion Vector Prediction (“MVP”) does not reflect an adoption of Nakamura’s proposal that would motivate a POSITA to combine Nakamura with WD4. *See* Pet. at 63–65. In F744, the JCTVC adopted only an extremely limited aspect of Nakamura: the “candidate search order and TMVP refidx derivation.” *See* Ex-2009 at 8; *see also* Ex-2001 at ¶ 148.

On the other hand, the principal technique of Nakamura, in which only “two spatial candidates and a temporal candidate are derived,” was flatly not adopted, with WD4 making use of 5 spatial candidates, whereas HM3.0 and Nakamura suggested using 4 and 2 spatial candidates respectively. *See* Ex-1010 at Figure 8-5; Ex-1007, Table 2. Given that the JCTVC considered Nakamura for integration into the Working Document and adopted only a narrow portion thereof, a POSITA would

not be compelled to reopen the JCTVC's consideration of Nakamura and adopt further aspects of the proposal that were previously rejected. Ex-2001 at ¶ 146.

4. Petitioner fails to demonstrate that the Challenged Claims are obvious in view of Nakamura and WD4 because Petitioner cannot demonstrate that WD4 is prior art

WD4 is not prior art to the '833 patent because WD4 was not publicly accessible before the priority date of the '833 Patent.

To be a prior art reference under 35 U.S.C § 102(a), a reference must be shown to be published, which requires that the reference be accessible to the public; while this does not require that a document was actually received by certain members of the public, it does require a satisfactory showing that the document had been “disseminated or otherwise made available to the extent that persons interested and ordinarily skilled in the subject matter or art, exercising reasonable diligence, can locate it.” *See Samsung Elecs. Co. v. Infobridge Pte. Ltd.*, 929 F.3d 1363, 1368-1369 (Fed. Cir. 2019). Respondents cannot make this requisite showing.

In support of its Petition, Petitioner has provided a declaration of Dr. Vivienne Sze, which includes a section addressing the “public availability of JCTVC documents” including WD4. Ex-1014.

In support of the proposition that WD4 was publicly available, Dr. Sze presents screenshots of the process she took to download a copy of JCTVC-F803-v3.zip, version 3 of the zip archive containing the documents associated with WD4,

through the JCT-VC document management website (<http://phenix.int-evry.fr/jct/>). Ex-1014 at 2. Dr. Sze also alleges that “persons interested in tracking the developments of the latest video coding standard would regularly visit the JCT-VC website to ensure that products and services they were developing were consistent with the HEVC Standard under development.” Ex-1014 at 9.

Illustrating the search she performed to find the WD4 document, Dr. Sze explains that she first navigated to the specific page for the meeting associated with WD4. To do this, she followed menu items to navigate from the website’s front page, to “All Meetings” and then to “Meeting Number 6 (“Torino”). Ex-1014 at 10. She then searched that meeting’s documents for terms such as “Working Draft” and “High-Efficiency Video Coding” to locate WD4 by its title. Ex-1014 at 15-16 (Ex-1014). This search, which relies on prior knowledge of the existence of WD4 to locate the document by its meeting location and highly generic title, does not constitute support for the public availability of WD4.

In *Samsung v. Infobridge*, the Federal Circuit directly addressed the public accessibility of the very same WD4 document after Samsung appealed the Board’s finding that WD4 was not publicly accessible. *See* 929 F.3d at 1365. With respect to the JCT-VC site, the Board found that “identifying a meeting location was key to navigating the JCT-VC site,” and that “a person who did not know to look under the Torino meeting would not have found the WD4 reference.” *See id.* at 1371. Samsung

also argued that testimony from Benjamin Bross, one of WD4's authors, supported the public availability of WD4, which the court dismissed stating "a work is not publicly accessible if the only people who know how to find it are the ones who created it," and that the Board "properly focused on whether those outside of the JCT-VC knew about the JCT-VC website." *Id.* at 1372. In confirming that the Board's findings were consistent with substantial evidence, the court in *Samsung* provided the following summary: "the structure of the [JCT-VC] 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." *Id.* at 1373.

The present facts match those of *Samsung*, and the Board should similarly determine that the WD4 reference was not publicly available as a matter of law. Dr. Sze's declaration reflects the same shortcomings noted by the Board in *Samsung*, requiring that a user should know to view documents pertaining to "Meeting Number 6 ('Torino')" in order to begin their search. Ex-1014 at 10. The user would then be shown 780 documents for that meeting, and be required to search for WD4 using terms in its highly generic title "Working Draft 4 of High-efficiency Video Coding" *See id.* at 11, 15-16. A POSITA would not have thought to search the Torino meeting for generic terminology such as "working draft" or "high efficiency video coding"

in search of prior art, and WD4 “would not have been reasonably accessible even if a skilled artisan knew about the JCT-VC website.” *Samsung*, 929 F.3d at 1372.

Further, the declaration of Vivienne Sze and the declaration of Clifford Reader have the same shortcomings as the testimony of Benjamin Bross from the *Samsung* case. *See id.* at 1372 (stating that the Board “properly focused on whether those outside the JCT-VC knew about the JCT-VC website.”). Dr. Sze describes herself as “an active member of JCT-VC since October 2010” and states that she attended every meeting between October 2010 and the end of 2012. Ex-1014 at 3. Likewise, Dr. Reader describes himself as “one of the top dog in the field of video coding,” Ex-2013 at 11:19-12:6, and maintains a database of video coding standardization documents going back to the 1990s, *id.* at 15:4–21:14; *see also* Ex-1050. Thus, Sze and Reader’s declarations are hardly evidence that a POSITA, particularly one outside the JCTVC, would have known to access WD4.

Petitioner also raises other arguments in favor of public availability, but these arguments likewise fail. Pet. at 16–18. Petitioner’s arguments primarily repeat the ineffective reasoning from Dr. Sze’s declaration, but additionally suggest that the existence of published papers which cite Nakamura and WD4 establish the public availability of WD4, as well as suggesting that the citation to WD4 on the face of the ’833 Patent establishes its prior art status. This is not the case, as the fact that a reference has been cited before does not establish that a POSITA would be able to

find WD4 without “already knowing what to look for and where to look for it.” *See Samsung*, 929 F.3d at 1372.

Because Petitioner offers threadbare evidence in support of the public availability of WD4, and in view of evidence which has already been considered in precedential case law, the Board should find that Petitioner is unable to show that the WD4 reference was publicly accessible as a matter of law. To the extent any teaching in WD4 is considered relevant to the claims of the ’833 Patent, the Petitioner has failed to demonstrate public availability of WD4.

5. The Petition Should Be Denied Under *Advanced Bionics* Because The Challenged Claims Issued Over Nakamura and WD4 and Petitioner Has Not Demonstrated Error.

The ’833 Patent issued over Nakamura and WD4, which are listed on the face of the Patent. Ex-1001 at 2. The petition does not establish that the examiner made any error in its analysis or interpretation of these references during prosecution. Discretionary denial of this ground under § 325(d) is therefore appropriate.

Under § 325(d), the Board should use a two-part analysis, considering: (1) whether the same or substantially the same art or arguments were presented to the PTO during the original prosecution; and (2) whether the Petitioner has demonstrated that the PTO erred in a manner material to the patentability of Challenged Claims. *Advanced Bionics, LLC v. Med-El Elektromedizinische Geräte*

GMBH, IPR2019-01469, Paper 8, 10 (P.T.A.B. Feb. 13, 2020) (“*Advanced Bionics*”) (precedential).

Once the Board determines that the same or substantially the same art or arguments were previously presented to the PTO, it should then consider whether the Petitioner has demonstrated error. *Advanced Bionics* at 8-10. “If a condition in the first part of the framework is satisfied and the petitioner fails to make a showing of material error, the Director generally will exercise discretion not to institute *inter partes* review. If reasonable minds can disagree regarding the purported treatment of the art and arguments, it cannot be said that the Office erred in a manner material to patentability. At bottom, this framework reflects a commitment to defer to previous Office evaluations of the evidence of record unless material error is shown.” *Id.*

For its Second Ground, the Petitioner briefly acknowledges that both references relied upon were identified to the examiner during prosecution of the ’833 Patent. Pet. at 13. The Petitioner indicates that the Examiner allowed the ’833 Patent without any substantive discussion of Nakamura, but this is not enough to satisfy the error requirement under *Advanced Bionics*. Whether and the extent to which a reference was discussed during prosecution is one of the *Becton, Dickinson* factors considered in applying discretion under 325(d) under *Advanced Bionics*. *Advanced Bionics* at 9, n. 10. Arguments concerning how the Patent Office treated a reference

falls under *Becton, Dickinson* factor (c), “the extent to which the asserted art was evaluated during examination, including whether the prior art was the basis for rejection.” *Id.* Under the two-step framework in *Advanced Bionics*, factor (c) is considered at the second step, where the Petitioner must show the Patent Office erred in its evaluation of the reference. *Id.* at 10

Given that the same art as Petitioner relies on was previously presented to the Patent Office, the burden shifts to Petitioner to show that the Office erred in a manner material to the patentability of the challenged claims. *Advanced Bionics*, Paper 6 at 8. Despite acknowledging both Nakamura and WD4 were considered by the examiner, the entirety of Petitioner’s analysis of whether the Patent Office erred is the statement that Nakamura teaches the limitation cited for allowance but was not the subject of a rejection. This statement is both wrong (for the reasons provided in Sections III.B.1 and III.B.2) and conclusory. Such conclusory statements cannot satisfy Petitioner’s burden to establish material error by the Examiner. *Autel Intelligent Tech. Corp., Ltd. v. Orange Elec. Co., Ltd.*, IPR2021-01545, Paper 8, 27 (P.T.A.B. April 8, 2022) (denying institution under 325(d) and noting that “Petitioner’s conclusory argument ... also fails to demonstrate that the Office erred.”); *Panduit Corp. v. Corning Optical Commc’ns LLC*, IPR2021-01562, Paper 20, 17 (P.T.A.B. April 6, 2022) (denying institution under 325(d) and finding “Petitioner’s assertion of Examiner error in the Reply to be conclusory and non-

persuasive” where “Petitioner cite[d] no evidence in support of its contention that the Examiner erred[.]”); *see also Universal Imaging, LLC v. Lexmark Int’l, Inc.*, IPR2019-01387, Paper 7, 15 (P.T.A.B. Feb. 27, 2020) (“Although Petitioner is correct that the Examiner did not reject any claims of the ’921 patent based on [the asserted reference], that is not the end of our analysis.”). Although the Examiner did not issue a rejection based on Nakamura, this is insufficient to show material error. *Sony Interactive Ent. LLC v. Terminal Reality, Inc.*, IPR2020-00711, Paper 15, 12 (P.T.A.B. Oct. 13, 2020) (Petitioner’s argument that asserted references were not substantively evaluated or applied in a rejection failed to sufficiently identify Examiner error).

The absence of an argument suggesting error on the part of the Patent Office is, in and of itself, fatal to Petitioner’s arguments under *Advanced Bionics*. Here, the Patent Office was presented with the actual art at issue, the Examiner applied these and similar references in a series of rejections, and ultimately issued the challenged claims over the art Petitioner now relies upon.

Even if Petitioner shows some disagreement about the treatment of the art, it will not be enough to overcome the “reasonable mind” standard this Board has previously established. *Advanced Bionics* at 8–10 (“If reasonable minds can disagree regarding the purported treatment of the art or arguments, it cannot be said that the Office erred in a manner material to patentability. At bottom, this framework reflects

a commitment to defer to previous Office evaluations of the evidence of record unless material error is shown.”).

Accordingly, the Board should defer to the previous Office evaluations and deny institution.

IV. CONCLUSION

For any or all of the above-described reasons, PO respectfully requests that the Board deny institution.

Dated: February 21, 2025

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CERTIFICATION OF WORD COUNT

The undersigned hereby certifies that the portions of the above-captioned **PATENT OWNER'S PRELIMINARY RESPONSE** specified in 37 C.F.R. §42.24 have 12,549 words, in compliance with the 14,000 word limit set forth in 37 C.F.R. §42.24(b)(1). This word count was prepared using Microsoft Word 2010.

Dated: February 21, 2025

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CERTIFICATION OF SERVICE

The undersigned hereby certifies that a copy of this **PATENT OWNER'S PRELIMINARY RESPONSE** Pursuant to 37 C.F.R. § 42.10(b) has been served on Petitioner via email on the following counsel of record for Petitioner:

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