

UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE PATENT TRIAL AND APPEAL BOARD

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

v.

INTERDIGITAL VC HOLDINGS, INC.,
Patent Owner

Case IPR2026-00193
U.S. Patent No. 11,936,876

**PATENT OWNER PRELIMINARY RESPONSE
UNDER 37 C.F.R. § 42.107(a)**

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TABLE OF CONTENTS

I.	INTRODUCTION	1
II.	OVERVIEW OF THE '876 PATENT	3
A.	Video Coding, Large Blocks, and Partitioning	4
B.	Intra- vs. Inter- Prediction	6
C.	Prediction Modes vs. Partition Types	8
D.	Problems with the Prior Art	10
E.	The '876 patent's novel intra prediction signaling techniques for large blocks.....	11
F.	Overview of Claims.....	15
III.	PROSECUTION HISTORY	16
IV.	PERSON OF ORDINARY SKILL IN THE ART (POSITA)	18
V.	CLAIM CONSTRUCTION	19
VI.	OVERVIEW OF THE PRIOR ART	19
A.	Xiong	19
1.	Xiong's Three Intra Prediction Methods	20
2.	Xiong's Method For Intra Frame Prediction Encoding/Decoding	21
3.	Xiong's Flags for Signaling	23
4.	Xiong's Process in Contrast to the '876 Patent	25
B.	VCEG-AJ21	26
VII.	REASONS TO DENY INSTITUTION (ALL GROUNDS; ALL INDEPENDENT CLAIMS).....	28
A.	Petitioner improperly relies on expert testimony to supply a missing claim limitation in violation of Rule 104(b)(4).....	28
B.	The combination of Xiong and VCEG-AJ21 fails to render obvious " <i>an intra prediction mode for the large block that is not further split into four equally sized sub-blocks.</i> ".....	32
1.	Xiong does not disclose applying an <i>intra prediction mode</i> for a large block ($\geq 32 \times 32$) that is not further split.....	32

2.	VCEG-AJ21, in combination with Xiong, also does not teach applying an <i>intra prediction mode</i> for a large block ($\geq 32 \times 32$).	36
C.	The combination of Xiong and VCEG-AJ21 fails to render obvious “ <i>a second syntax element indicating a single spatial intra partition type for at least one basic coding unit sized sub-block.</i> ”	38
D.	Petitioner’s motivation to combine Xiong and VCEG-AJ21 is hindsight-driven and ignores the technical context of the references.	40
VIII.	CONCLUSION.....	43

PATENT OWNER'S EXHIBIT LIST

Exhibit No.	Description
2001	Complaint, <i>InterDigital, Inc. v. Amazon.com Services LLC</i> , Case No. 2:25-cv-00822 (EDVA Dec. 18, 2025)
2002	“Licensing at InterDigital,” <i>InterDigital</i> , available at https://www.interdigital.com/licensing (last accessed Feb. 20, 2026)
2003	Declaration of Ryan Pohlman
2004	“InterDigital renews license agreement with Sony,” <i>InterDigital</i> , available at https://ir.interdigital.com/news-events/press-releases/news-details/2026/InterDigital-renews-license-agreement-with-Sony/default.aspx (last accessed Mar. 3, 2026)
2005	“InterDigital signs license agreement with HP,” <i>InterDigital</i> , available at https://ir.interdigital.com/news-events/press-releases/news-details/2025/InterDigital-signs-license-agreement-with-HP/default.aspx (last accessed Mar. 3, 2026)
2006	“2025: InterDigital’s Year In Review,” <i>InterDigital</i> , available at https://www.interdigital.com/post/2025-interdigitals-year-in-review (last accessed Mar. 3, 2026)
2007	“InterDigital enforces patents against Amazon,” <i>InterDigital</i> , available at https://ir.interdigital.com/news-events/press-releases/news-details/2025/InterDigital-enforces-patents-against-Amazon/default.aspx (last accessed Mar. 3, 2026)
2008	Enforcement and Non-waiver of 37 C.F.R. § 42.104(b)(4) and Permissible Uses Of General Knowledge In <i>Inter Partes</i> Reviews (July 31, 2025), available at https://www.uspto.gov/sites/default/files/documents/aapa_memo_final__signed.pdf (last accessed March 5, 2026)
2009	InterDigital, Inc. Form 10-K (Annual Report), United States Securities and Exchange Commission, File No. 1-33579

Exhibit No.	Description
2010	<i>Amazon.com, Inc. et al. v. InterDigital et al.</i> , Claim No. HP-2025-000043 Transcript of Proceedings December 3, 2025 in the High Court of Justice, London, England
2011	U.S. Publication No. 2010/0086029 to Chen et al.
2012	Havlicek Declaration from IPR2026-00192 (U.S. Patent No. 12,143,606)
2013	U.S. Publication No. 2009/0046781 to Moriya et al.
2014	Meeting Notes Accompanying VCEG-AJ21 - ITU Video Coding Experts Group (VCEG) Archive at VCEG-AJ01.zip accessible at https://www.itu.int/wftp3/av-arch/video-site/0810_San/

I. INTRODUCTION

Patent Owner respectfully submits that the Director should deny the Petition because Petitioner does not meet its burden to show that claims 1-18 (the “challenged claims”) of U.S. Patent 11,936,876 (“the ’876 patent”) are unpatentable over the applied references. The Petition presents unpatentability Grounds 1A-1B, but these Grounds do not present compelling reasons as to why the claims of the ’876 patent should be found unpatentable.

At the outset, Petitioner effectively presents the same flawed theories already considered and expressly overcome during prosecution. In particular, Petitioner relies on the theory that Xiong’s small-block techniques would easily be extended to larger blocks. Not so. During prosecution, the Examiner explicitly noted that such a theory would not render the claims obvious. The Examiner indicated that art that failed to explicitly disclose an intra prediction mode for a whole large block (e.g., 32×32) would be deficient. Despite the Office’s previous explanation, Petitioner has tried to adopt the same faulty theory by attempting to stretch Xiong’s narrow teachings onto large blocks. Because Petitioner presents the same flawed theories that the Office has already considered and dismissed, the Director should reach the same conclusion here and deny institution on the merits.

The Petition also suffers from several substantive deficiencies with respect to particular language of the claims.

First, Petitioner violates 37 C.F.R. § 42.104(b)(4) by improperly relying on expert testimony to allegedly supply missing claim limitations present in every independent claim: a “*large block [having] a block size equal to or larger than 32×32 , and the large block size is greater than a size of a basic coding unit*” and applying “*an intra prediction mode for the large block that is not further split into four equally sized sub-blocks.*”¹ Specifically, Petitioner solely relies on expert testimony to address missing claim limitations while inventing out of whole cloth new, large-block signaling parameters not explicitly recited in the art. This directly violates Rule 104(b)(4) and the Director should deny institution. *See* EX2008 (Board Memorandum Regarding Enforcement and Non-Waiver of 37 C.F.R. §42.104(b)(4) (July 31, 2025)).

Second, the combination of Xiong and VCEG-AJ21 fails to disclose or render obvious at least the claimed applying an “*intra prediction mode for the large block that is not further split into four equally sized sub-blocks.*”

Specifically, the combination does not describe any intra prediction signaling for a larger block of size 32×32 or greater.

¹ For ease of reference, Patent Owner will identify claim language from the ’876 patent using *italics*, and will identify language quoted from other exhibits using regular font.

Third, the combination of Xiong and VCEG-AJ21 fails to disclose or render obvious the claimed “*second syntax element indicating a single spatial intra partition type for at least one basic coding unit sized sub-block.*” Petitioner relies on a particular flag described in Xiong for 16×16 blocks, but this flag cannot teach both a *binary split signaling syntax* **and** the claimed *second syntax element*.

Fourth, Petitioner has not demonstrated that a POSITA would have been motivated to combine Xiong and VCEG-AJ21 given Xiong’s focus on *intra* prediction and VCEG-AJ21’s sole focus on *inter* prediction.

As illustrated by the above defects, Petitioner has not met—and cannot meet—its burden of establishing the unpatentability of the challenged claims of the ’876 patent. Accordingly, Patent Owner respectfully submits the Director should deny the Petition.

II. OVERVIEW OF THE ’876 PATENT

The inventors of the ’876 patent developed “methods and apparatus for signaling intra prediction for large blocks for video encoders and decoders.” EX1001, Title. Specifically, the ’876 patent describes a process for efficiently signaling intra prediction for large blocks by (i) signaling “hierarchical layer intra prediction” for a large block ($\geq 32 \times 32$) using a binary syntax element and an intra prediction mode, and (ii) identifying a “basic coding unit size” block and “assigning a single spatial intra partition type” for the block. EX1001, Abstract,

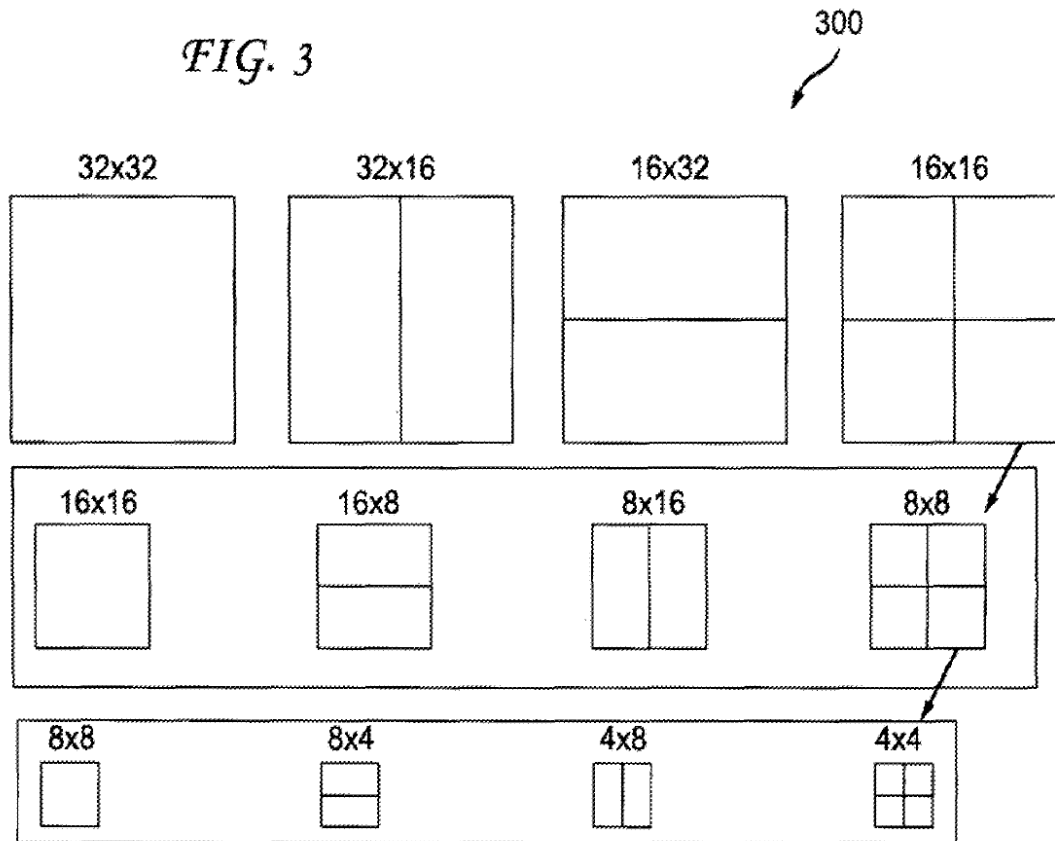
4:20-34, 9:48-10:66, Table 4. Before addressing the specific deficiencies of Petitioner's applied references, Patent Owner provides a brief discussion of the key aspects relating to the '876 patent's intra prediction techniques for large blocks. *See, e.g.*, EX1001, 9:42-10:66.

A. Video Coding, Large Blocks, and Partitioning

The '876 patent is directed to “video encoding and decoding” and specifically “signaling intra prediction for large blocks for video encoders and decoders.” EX1001, 1:21-24. Encoding video refers to transforming images in a way that can be communicated and transmitted. *See, e.g.*, EX1003, ¶20. This typically includes transforming or compressing the images using techniques that reduce the size of the transmitted data. *Id.* Decoding the received transmission includes reconstructing the images using the agreed upon encoding and decoding scheme(s). *Id.*

To illustrate, the '876 patent describes the “MPEG-4 AVC Standard” (also known as “H.264”) as an example encoding/decoding scheme. EX1001, 1:30-37. The MPEG-4 AVC Standard uses a “macroblock” structure that is used to determine how to encode pictures or frames of a video. EX1001, 1:30-42, 2:4-11. Portions of a particular image in a video can be represented as macroblocks. EX1003, ¶19. Figure 3 of the '876 patent, reproduced below, depicts macroblocks

and the division of macroblocks for motion prediction or inter prediction between different images. EX1001, 3:26-36.



EX1001, FIG. 3.

As further explained below, the '876 patent describes techniques for partitioning and signaling macroblocks and especially large-sized macroblocks having a size of 32×32 or greater (e.g., 32×32 or 64×64). While extensions to the MPEG-4 AVC Standard described large block partitioning and signaling for *inter* prediction techniques, the MPEG-4 AVC Standard did not address large block partitioning for *intra* prediction techniques. EX1001, 3:18-63. Recognizing a

deficiency in the prior art, the inventors developed novel techniques for partitioning and signaling large block *intra* prediction. EX1001, 4:20-30, 9:42-53, 11:51-12:53, Table 4.

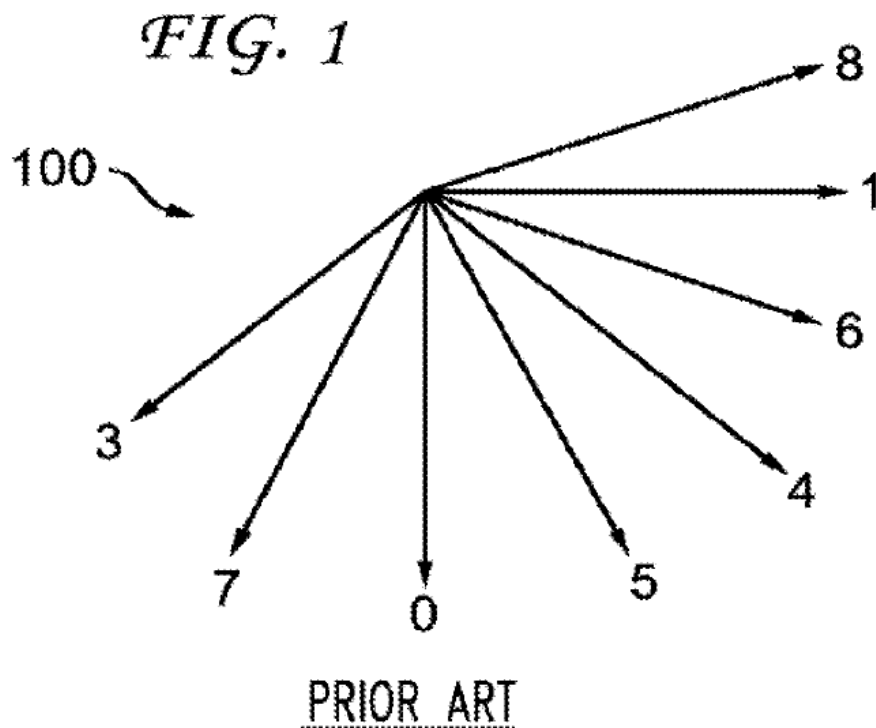
B. Intra- vs. Inter- Prediction

As a recognition of problems in the prior art, the '876 patent notes that while large block partition signaling for *inter* prediction was previously developed, no such partition signaling had been developed for *intra* prediction with large blocks. EX1001, 3:18-62. While both prediction modes allow video encoding systems to exploit image redundancies to provide additional savings when signaling video data, these two prediction modes differ significantly. EX2011 (Chen), ¶¶5, 89, 90, 92-96.

For example, *inter* prediction examines image information from previous or future reference frames and is used to predict movements or changes in the current frame. EX2011, ¶¶89, 92-96. This type of prediction exploits redundancies *between different images* in a video sequence. *Id.* Well-known examples of inter prediction techniques include motion estimation (ME) and motion compensation (MC). *Id.* The '876 patent states that previous approaches for “large motion (inter) partitions” were known in the art for 32×32 or 64×64 blocks. EX1001, 3:18-25.

In contrast, *intra* prediction—which is most pertinent to the '876 patent—refers to examining image information from neighboring image areas *within the*

same image or frame. EX2011, ¶¶90, 92. This type of prediction exploits redundancies *within the same image* (i.e., that a particular pixel is redundant with nearby pixels in the same image) rather than *between different images*. *Id.* For example, with reference to Figure 1, reproduced below, the '876 patent describes intra prediction modes in terms of predicting nearby pixels in a particular direction.



EX1001, FIG. 1.

The '876 patent explains each prediction mode or direction in the following manner:

In FIG. 1, the reference numeral 0 indicates a vertical prediction mode, the reference numeral 1 indicates a horizontal prediction mode, the reference numeral 3 indicates a diagonal-down/left prediction mode,

the reference numeral 4 indicates a diagonal-down/right prediction mode, the reference numeral 5 indicates a vertical-right prediction mode, the reference numeral 6 indicates a horizontal-down prediction mode, the reference numeral 7 indicates a vertical-left prediction mode, and the reference numeral 8 indicates a horizontal-up prediction mode.

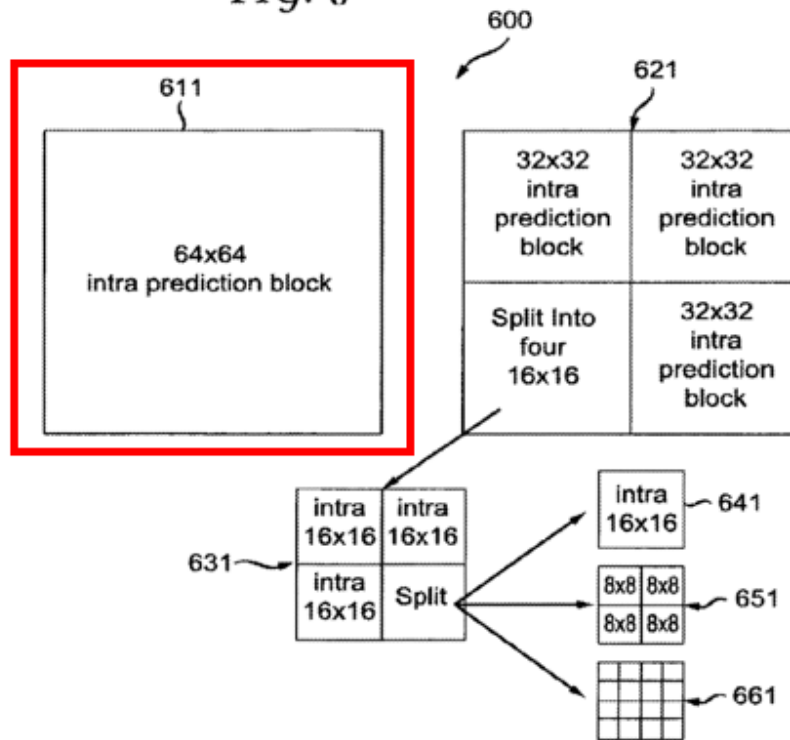
EX1001, 1:50-2:10; *see also id.*, 2:12-19, FIG. 2 (depicting a “plane prediction mode” as another example).

In this manner, the ’876 patent describes *intra* prediction—as opposed to fundamentally different *inter* prediction—and describes large block partitioning techniques for *intra* prediction when encoding image or video. EX1001, 3:66-4:19 (“methods and apparatus for signaling *intra* prediction for large blocks”), 9:42-62, 10:3-48; *see also* EX1001, Cl. 1 (reciting “*determining that intra prediction is to be performed for the large block*” and “*a single spatial intra partition type*”).

C. Prediction Modes vs. Partition Types

In addition to different prediction modes (e.g., vertical, horizontal, etc.) for intra prediction, the ’876 patent also emphasizes different partition types. As previously referenced, partitioning refers to dividing a block into smaller blocks for further processing or applying a prediction mode. *See, e.g.*, EX2011, ¶¶5, 80-81. For example, as seen in Figure 6, the ’876 patent depicts a large block having a size of 64×64 (611 in Figure 6):

FIG. 6



EX1001, FIG. 6 (annotated).

Figure 6 further depicts partitioning the 64×64 block into four 32×32 blocks (621) as well as potentially further dividing one or more of the 32×32 blocks into 16×16 blocks (631). EX1001, 10:3-16. The 16×16 blocks may be used as-is (641) or further partitioned into either 8×8 blocks (651) or 4×4 blocks (661). EX1001, 10:21-24. A particular prediction mode is applied corresponding to the partition size. EX1001, 9:48-62, 10:25-35, 11:51-12:53, Table 4. For example, as further described in Section II.E and seen from Figure 6, the '876 patent describes applying a particular intra prediction mode depending on the partition size. *Id.* The partition sizing and corresponding prediction mode that is ultimately used to

encode a large block depends on a rate distortion comparison as further described in Section II.E.

D. Problems with the Prior Art

With a thorough understanding of these foundational concepts, the inventors of the '876 patent identified several issues with the existing encoding/decoding techniques at the time. For example, the inventors noted that conventional intra partition techniques did not address signaling for large blocks (e.g., having a size equal to or greater than 32×32). EX1001, 3:59-62. For example, the '876 patent indicated that while conventional *inter* prediction techniques were developed for large blocks, “[i]f a larger block size than 16×16 is used for *intra* prediction, then several possible issues are faced.”² EX1001, 2:20-35.

For example, if intra prediction for 32×32 or 64×64 blocks is simply added to the MPEG-4 AVC Standard by extending an identifier of the macroblock type, “it will cause too much overhead for those two new modes and, in addition, will not allow a hierarchical type of intra prediction.” EX1001, 2:36-45. The increased overhead signaling resulting from merely extending conventional *intra* prediction techniques for 16×16 block sizes to larger block sizes was therefore a motivation

² Emphasis added throughout unless otherwise specified.

for the inventors to develop additional techniques for efficient intra partition signaling. EX1001, 2:36-50.

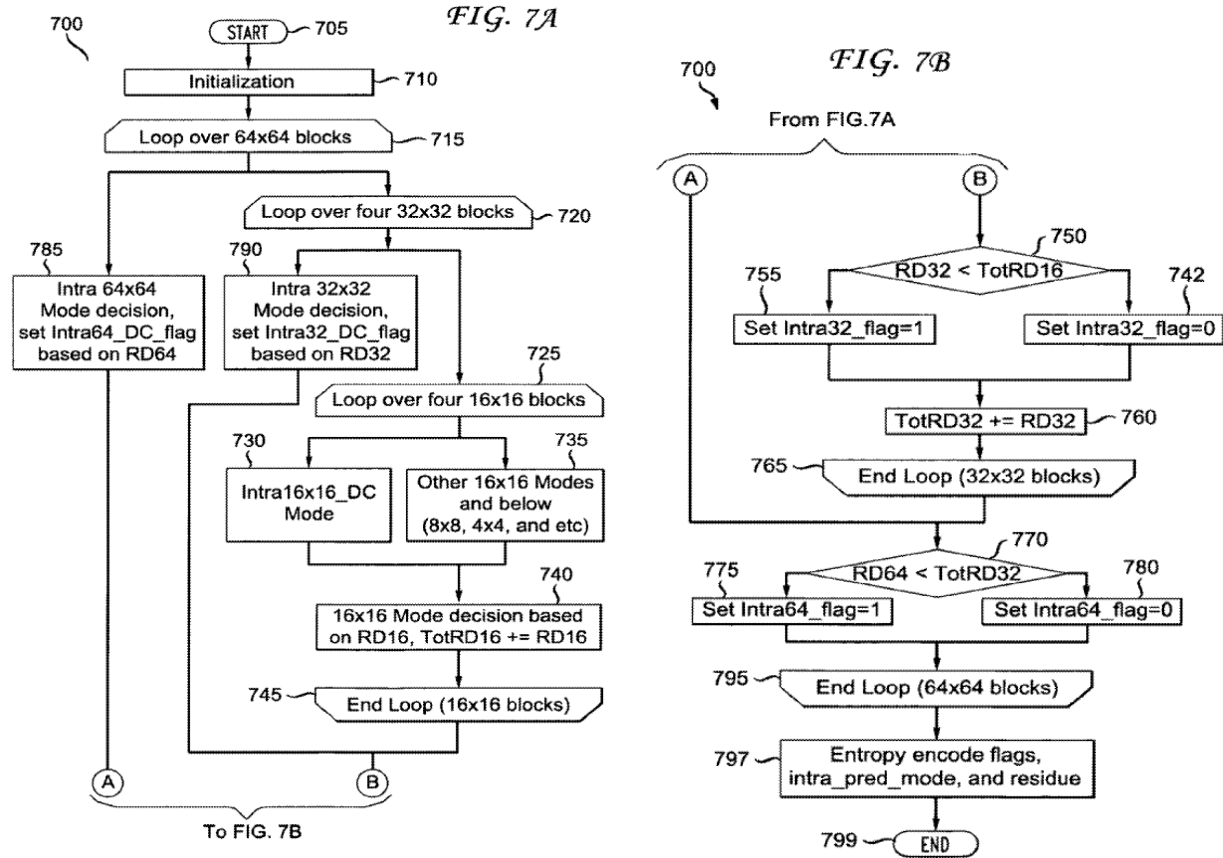
Moreover, while acknowledging that techniques existed for addressing large block partitioning for *inter* prediction, the inventors noted that such techniques would not be applicable to *intra* prediction. EX1001, 3:18-25, 3:59-62. Rather, “the existing literature does not address how *large intra mode is signaled*, where large intra mode is defined to mean *intra* prediction involving partition blocks having a size equal to or larger than 32×32 .” EX1001, 3:59-62.

In view of this background, the inventors developed an intra prediction signaling technique for large blocks that avoided the signaling overhead issues identified in the art by allowing a hierarchical type of intra prediction for large blocks and enabling efficient partition selection for small blocks. EX1001, 4:20-30, 9:42-53, 11:51-12:53, Table 4.

E. The '876 patent's novel intra prediction signaling techniques for large blocks.

To provide an intra prediction for large blocks while maintaining efficient signaling, the '876 patent proposed a novel signaling technique using (1) a binary split signaling syntax element to identify whether to split a large block, (2) signaling an intra prediction mode for a large block that is not split into sub-blocks, and (3) a second syntax element indicating a single spatial intra partition type for a basic coding unit within the large block. EX1001, 4:20-30, 9:42-62,

11:51-12:53, Table 4. An example of this technique is depicted in Figures 7A and 7B, reproduced below.



EX1001, FIGs. 7A-7B.

Figures 7A-7B depict a method for “encoding picture data for large blocks by signaling intra prediction for the large blocks.” EX1001, 13:57-60. In this example, a large block of size 64×64 is encoded. EX1001, 13:63-67. Figures 7A-7B depict applying intra prediction for multiple block divisions (e.g., 64×64, 32×32, 16×16, 8×8, and 4×4) to determine the best partition size and prediction mode to use for intra prediction. EX1001, 14:1-32 (e.g., steps 785, 790, 740).

Based on the rate distortion determinations for each size, the encoder determines whether to split the large 64×64 block. EX1001, 14:49-58 (steps 770, 775, 780).

In this example, if the rate distortion for intra prediction for the 64×64 block is less than the total rate distortion for splitting the large 64×64 block into 32×32 blocks, then the `Intra64_flag` is set to one. EX1001, 14:49-58 (step 775). This signals that the 64×64 block need not be split when performing intra prediction. EX1001, 11:49-53. In contrast, if the rate distortion for intra prediction for the 64×64 block is greater than the total rate distortion for splitting the large 64×64 block into 32×32 blocks, then the `Intra64_flag` is set to zero, which signals that the 64×64 block will be split into four equally sized blocks of 32×32 . EX1001, 14:49-58, 11:49-53. In this manner, a first flag or syntax element identifies whether a large block is to be split. EX1001, 11:49-12:8. An additional parameter (“`intra_pre_mode_64`”) also indicates an intra prediction mode that is applied to large blocks that are not further split when the flag is set to one. *Id.*

In addition to indicating whether to split the large block, the particular intra prediction is also encoded and signaled. EX1001, 9:48-62, 10:38-48, Table 2, Table 3. The '876 patent explains that:

we split the signaling of intra prediction into the following two parts:
`sip_type` (spatial intra partition type, which can be `INTRA4×4`, `INTRA8×8`, `INTRA16×16`, and so forth); and `intra_pred_mode` (such

as, e.g., the 9 Intra Prediction Modes within INTRA4×4 and INTRA8×8) within each sip_type.

EX1001, 9:48-62.

The '876 patent provides Table 2 as an example of the particular “*spatial intra partition type*” or “*sip_type*” to apply, which can be identified via an index or binarization bits:

TABLE 2

Sip_type	Index	Binarization bits
SIP8x8	0	0
SIP16x16DC	1	10
SIP16x16	2	110
SIP4x4	3	1110

EX1001, Table 2 (10:54-66).

In this manner, the index or binarization bits in the '876 patent identify a single “sip_type” from among multiple potential sip_types. EX1001, 10:54-66, 12:9-10 (“sip_type [i] specifies the spatial intra partition type for the basic block coding unit in the ith 16×16 block”).

In view of this description, the '876 patent describes using (1) a flag (“*a binary split signaling syntax element*”) to indicate whether a large block is further split into four equally sized sub-blocks, (2) an intra prediction mode for the large

block that is not further split, and (3) a “*a second syntax element*” to identify the spatial intra partition type to use for the basic coding unit sized block. EX1001, 4:20-30, 9:42-62, 11:51-12:53, Table 4, Claim 1.

F. Overview of Claims

The techniques and benefits described in the '876 patent are reflected in the claims. For example, independent claims 1 and 5 are directed to a method and apparatus for performing the above-described decoding techniques. Independent claims 11 and 15 are directed to a method and apparatus for performing the above-described encoding techniques. Claim 1 is reproduced below with emphasis added to specific points of distinction between the claim language and Petitioner's asserted references:

1. A method of decoding picture data for at least a large block in a picture, the method comprising:

determining that intra prediction is to be performed for the large block, wherein *the large block has a block size equal to or larger than 32×32, and the large block size is greater than a size of a basic coding unit;*

decoding a binary split signaling syntax element specifying that the large block is further split into four equally sized sub-blocks;

decoding an intra prediction mode for the large block that is not further split into four equally sized sub-blocks;

partitioning the large block into the four equally sized sub-blocks in response to the decoded binary split signaling syntax element specifying that the large block is further split into four equally sized sub-blocks; and

decoding a second syntax element indicating a single spatial intra partition type for at least one basic coding unit sized sub-block, the single spatial intra partition type being determinable from among a plurality of spatial intra partition types.

As seen from the emphasized portions of claim 1, the key features described in the specification, which also distinguish the claims from the prior art, are likewise reflected in the claims. *See* Section II.E. This includes applying intra prediction to a large block (greater than or equal to 32×32), applying an intra prediction mode for the large block that is not further split into four equally sized sub-blocks, and applying a second syntax element that indicates a single spatial intra partition type for the basic coding unit.

III. PROSECUTION HISTORY

The '876 patent was thoroughly examined during prosecution. Specifically, prosecution included the following:

(1) five world-wide prior art searches by the Office on: August 16, 2022 (EX1002, 18, 24-46), February 7, 2023 (EX1002, 19, 49-72), August 25, 2023 (EX1002, 20, 76-104), September 7, 2023 (EX1002, 21, 108-136), December 6, 2023 (EX1002, 22-23, 140-170);

(2) two Office Actions on the merits (EX1002, 1075-1108, 1136-1167) and corresponding claim amendments and remarks (EX1002, 1126-1133, 1175-1181);

(3) an Examiner interview and Examiner's amendment incorporating allowable subject matter (EX1002, 1188-1193); and

(4) several information disclosure statements, including those identified above citing Xiong, VCEG-AJ21, and H.264 (March 2005) (EX1002, 268-277, 983-984, 1204-1205, 1446, 1636-1637).

During prosecution, the claims were allowed specifically due to incorporation of "*decoding an intra prediction mode for the large block that is not further split into four equally sized sub-blocks*" into the claims. In the Statement of Reasons for Allowance, the Examiner explicitly noted:

[T]he prior art does not render obvious signaling the intra prediction mode used for the large block. Even in the case of a 32x32 or 32x16 block, ***Chen and Moriya do not disclose an intra prediction mode for the whole 32x32 block*** (e.g. the 32 x 32 Intra DC mode proposed by the Applicant or unifying the 4 16x16 partition modes together) and rely on partitioning the larger block into smaller prediction units with basic / base block sizes for intra prediction.

EX1002, 1643.

As further detailed in Section VII, Petitioner now attempts to resurrect these same flawed theories by substituting Xiong and VCEG-AJ21 for the previously considered U.S. Publication No. 2010/0086029 (EX2011; "Chen") and U.S.

Publication No. 2009/0046781 (EX2013; “Moriya”). This is a distinction without a difference: Petitioner relies on Xiong for the same teaching of large blocks (e.g., 32×32), and partitioning large blocks into smaller prediction units found in Chen, EX2011, ¶¶6, 115, 158-161, and uses VCEG-AJ21 to substitute for Chen and Moriya’s teaching of hierarchical partitioning for large blocks. *Compare* EX1008, FIG. 3, *with* EX2011, FIG, 4A; EX2013, FIGs. 2-3. Petitioner therefore presents the same flawed theories that the Office has already considered and dismissed. As such, the Director should exercise its discretion to reach the same conclusion here and deny institution.

IV. PERSON OF ORDINARY SKILL IN THE ART (POSITA)

A POSITA is presumed to be aware of all pertinent art. The POSITA possesses the “understandings and knowledge reflected in the prior art” and thinks along conventional wisdom. *See Abbott Lab’ys. v. Andrx Pharms., Inc.*, 452 F.3d 1331, 1336 (Fed. Cir. 2006). At this stage, Patent Owner submits that the Director does not need to resolve the appropriate level of skill for a POSITA for purposes of deciding institution because the Petition fails under any articulation of a POSITA.

In any event, solely for purposes of this Preliminary Response, Patent Owner applies Petitioner’s level of skill for a person of ordinary skill in the art (POSITA). Pet., 10-11.

V. CLAIM CONSTRUCTION

Petitioner does not propose any terms for construction in the Petition because “no constructions are necessary to resolve any disputes identified in this Petition.” Pet., 11. Regarding the term “basic coding unit,” Petitioner “does not believe it requires construction,” but for avoidance of doubt, Petitioner proposes that the term should “at least encompass a 16×16 block.” *Id.*

For purposes of this Preliminary Response and the arguments presented below, Patent Owner applies Petitioner’s interpretation of a “basic coding unit.” Even under Petitioner’s interpretation, Petitioner’s asserted grounds fail. Patent Owner, however, reserves the right to contest Petitioner’s express or implicit constructions or any newly presented explicit constructions during the proceeding, should the Director decide to institute review.

VI. OVERVIEW OF THE PRIOR ART

A. Xiong

Xiong is directed to a “Method and a Device for Intra Frame Prediction Encoding/Decoding.” EX1006, Title. Similar to the MPEG-4 AVC Standard described in the background of the ’876 patent, Xiong describes conventional techniques for selecting among multiple intra prediction methods on a per-block basis within a single frame. EX1006, Abstract. Xiong primarily describes applying intra prediction and partitioning to 16×16 macroblocks. EX1006, 6. While Xiong off-handedly mentions that a macroblock may exist as a “ 32×32 macroblock,”

Xiong provides no explanation for how this would occur or any parameters facilitating the extension of its techniques to larger macroblocks. *Id.*

Additional features from Xiong are discussed below.

1. Xiong's Three Intra Prediction Methods

While Xiong describes the use of “intra frame prediction encoding methods,” Xiong only describes three types of intra prediction methods:

- (1) H.264/AVC;
- (2) Displacement for H.264/AVC; and
- (3) Template Matching.

EX1006, 1-2, 5, FIG. 5. As explained in Xiong, however, these intra prediction methods apply to block sizes of 4×4 , 8×8 , and 16×16 . *Id.* There is no indication or discussion in Xiong that these intra prediction methods would apply to larger block sizes like 32×32 , let alone *how* they would be applied to a large block.

For example, for the first intra prediction method specified by the ***H.264/AVC standard***, Xiong only states that “H.264/AVC supports intra frame prediction for 4×4 , 8×8 , and 16×16 pixel macroblocks.” EX1006, 1. Examining the H.264/AVC standard itself confirms this understanding. EX1010, 122-143 (§ 8.3). Therefore, Xiong does not describe applying this same intra prediction method to a larger 32×32 block.

Similarly, Xiong's discussion of the second intra prediction method—

displacement intra prediction (DIP)—applies to H.264/AVC and is therefore also described as only applying to 4×4 , 8×8 , and 16×16 block sizes. EX1006, 2. Again, Xiong does not describe applying DIP to a larger 32×32 block.

And finally, Xiong’s discussion of the third intra prediction method—*template matching*—also does not apply to larger blocks of size 32×32 or greater. Indeed, Xiong limits template matching to just **4×4 and 8×8** sizes: “This template matching method can serve as an additional mode for H.264/AVC, and it is applicable to intra 4×4 blocks or intra 8×8 prediction blocks.” EX1006, 2.

In this manner, Xiong describes each of its intra prediction methods as applying to smaller-sized blocks and does not describe any of these intra prediction methods applying to larger blocks (e.g., sized 32×32 or greater).

2. Xiong’s Method For Intra Frame Prediction Encoding/Decoding

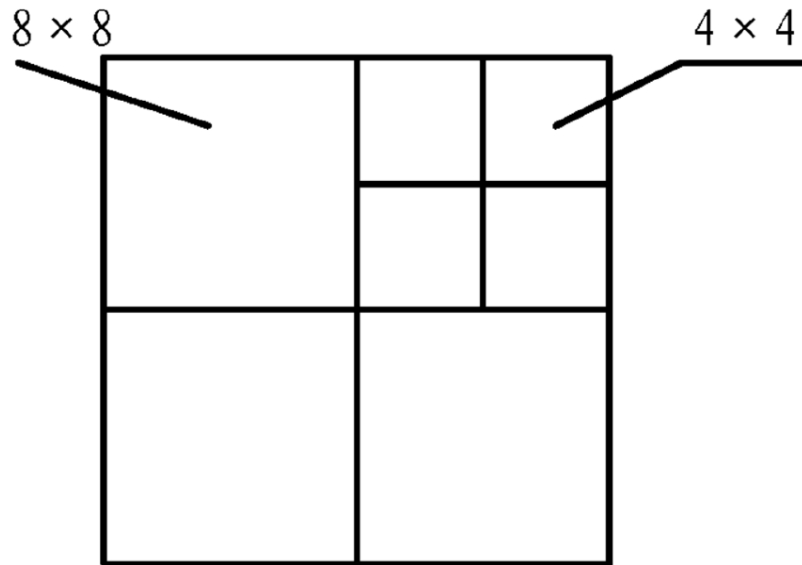
Xiong describes a process for encoding a macroblock that has a size of 16×16 . EX1006, 5-6. Xiong states:

Taking a 16×16 macroblock as an example, a 16×16 macroblock can be hierarchically divided into four 8×8 sub-blocks, and each 8×8 sub-block can be further divided into four 4×4 sub-blocks. The encoding end performs multiple prediction encodings on the 16×16 macroblock, the 8×8 sub-blocks within the macroblock, and the 4×4 sub-blocks within the macroblock. From the combinations of candidate encoding results, the combination with the best rate-distortion performance is

selected as the final encoding result of the macroblock and is organized in a hierarchical tree structure.

EX1006, 6.

Based on this partitioning, Xiong describes Figure 5, which provides an encoding result for the 16×16 macroblock.



EX1006, FIG. 5.

Based on the processing performed for these blocks, Xiong describes an example with the following result, where different portions of the 16×16 macroblock are encoded using different intra prediction techniques (EX1006, 6):

Portion of 16×16 macroblock	Intra Prediction Applied
Top-left 8×8 sub-block	Displacement (DIP)
Top-Right 8×8 sub-block	<i>combination of intra prediction techniques for the 4×4 sub-blocks</i>

Bottom-left 8×8 sub-block	H.264/AVC (Directional)
Bottom-Right 8×8 sub-block	Template matching

For the top-right cluster of 4×4 sub-blocks, Xiong describes an example where “the final encoding result of the 4×4 sub-block in the upper-right corner is obtained using the displacement intra frame prediction method; and the remaining three 4×4 sub-blocks have their optimal encoding results obtained using the directional prediction method of H.264/AVC.” EX1006, 6.

In view of this example, Xiong describes a process where different intra prediction methods and different partition types can be applied to different portions of a block. EX1006, Abstract, 6.

3. Xiong’s Flags for Signaling

To facilitate Xiong’s multiple intra prediction methods for different portions of a particular macroblock, Xiong describes a multi-step signaling process that uses several flags and parameters to instruct a decoder to apply each intra prediction method to different portions of a frame. EX1006, 8-9, Table 1. For example, Xiong describes a multi-step check process to determine whether to continue to divide a block or to stop dividing a block. EX1006, 8. The parameters in the table below identify Xiong’s multi-step signaling process (EX1006, 8):

Flag Name	Effect
------------------	---------------

ext_16x16_pred_flag	When 1, indicates that macroblock is partition as 16×16 When 0, indicates that macroblock is further divided into 8×8 blocks
ext_8x8_pred_flag	When 1, indicates that prediction within the 8×8 block When 0, indicates that 8×8 block if further divided into 4×4 blocks
ext_16x16_pred_mode	Indicates the intra frame prediction used when partitioned as 16×16
ext_8x8_pred_mode	Indicates the intra frame prediction used for each sub-block partitioned as 8×8
ext_4x4_pred_mode	Indicates the intra frame prediction used for each sub-block partitioned as 4×4

As seen from these parameters, Xiong describes using ext_16x16_pred_flag to signal whether a macroblock is further divided into 8×8 blocks. EX1006, 8, 10, Table 1. Then, ext_8x8_pred_flag signals whether an 8×8 block is further subdivided. *Id.* In this manner, Xiong describes a multi-step process that a decoder employs to determine which partition types to use for any particular macroblock. *Id.*

Notably, Xiong does not describe any parameters for addressing 32×32 blocks. As will be further explained in Section VII.A, Xiong's failure to explain how 32×32 blocks would be addressed results in Petitioner relying exclusively on expert testimony to supply missing limitations.

4. Xiong's Process in Contrast to the '876 Patent

Xiong's flags and multi-step process still does not disclose the '876 patent's streamlined approach of conveying (1) *a binary split signaling syntax element* specifying whether to split a large block, (2) *an intra prediction mode* for a large block that is not further split, and (3) *a second syntax element* identifying the single spatial intra partition type to use for each basic coding unit that is smaller than the large block. EX1001, 4:20-30, 9:42-62, 11:51-12:53, Table 4.

Because Xiong's process would be inefficient for larger 32×32 blocks, the '876 patent introduced a new signaling framework: (1) a hierarchical layer intra prediction for large blocks ($\geq 32 \times 32$), using *a binary split signaling syntax element* to indicate whether to split a large block and signaling *an intra prediction mode* of a large block that is not further split (e.g., `intra32_flag`, `intra64_flag`, and corresponding intra prediction modes) and (2) partition type selection for smaller blocks (e.g., basic coding unit sized blocks), using a separate "*second syntax element*" for indicating a single spatial intra partition type. EX1001, 9:48-53, 10:38-48, Table 2; Section II.E. The '876 patent's signaling framework addresses the signaling limitations of the prior art like Xiong. EX1001, 9:42-62, 11:9-12:53. The '876 patent explains that naively extending existing signaling to support INTRA 32×32 or INTRA 64×64 would cause excessive overhead, motivating the disclosed solution of partition type selection at the basic coding unit level.

EX1001, 2:36-45, 4:20-34, 9:48-62. This again differs from Xiong's process, which contemplates using `ext_16x16_pred_flag` for 16×16 blocks but does not describe using **two separate syntax elements** to process larger blocks. EX1006, 10. Aside from off-handedly mentioning that macroblocks may exist as 32×32 blocks, Xiong provides no explanation for *how to apply its teachings* to 32×32 blocks, which is particularly problematic in light of the increased overhead and overall inefficiencies that were known to arise from doing so. EX1001, 2:33-50.

As will be further explained in Section VII.C, Xiong's failure to acknowledge the issues identified in the '876 patent ultimately results in Xiong operating in a manner different from the '876 patent. Namely, Xiong does not teach the claimed "***second syntax element indicating a single spatial intra partition type for at least one basic coding unit sized sub-block***" because Xiong's `ext_16x16_pred_flag` cannot teach both the claimed "***binary split signaling syntax element***" and the "***second syntax element***." Thus, even if Xiong's techniques were simply extended to 32×32 blocks, Xiong would still operate in a manner fundamentally different from the '876 patent.

B. VCEG-AJ21

VCEG-AJ21 appears to be a proposal for extending the architecture of the H.264 standard, entitled "Enlarging MB size for high fidelity video coding beyond HD." EX1008, 1. VCEG-AJ21 purports to "enlarge the macroblock (MB) of 16×16

for HD or beyond HD video sequences.” EX1008, 2. VCEG-AJ21 provides an example of enlarging the macroblock size for H.264 to “NxN” and provides examples of 32x32, 64x64, and 128x128 macroblock sizes. EX1008, 3-4.

Critically, VCEG-AJ21 applies the extension of the macroblock sizes only to *inter* prediction and explicitly does not apply its techniques to *intra* prediction.

VCEG-AJ21 states:

In this proposal, the extended architecture with the enlarged MB structure are *first proposed for ME&MC [motion estimation (ME) and motion compensation (MC)]* but *new designs of* transform kernels, *intra prediction*, luma/chroma DC transforms, CABAC context models and de-blocking filters for the enlarged MB *are not yet addressed*.

EX1008, 1.

As seen from the Abstract, VCEG-AJ21 refers to motion estimation (ME) and motion compensation (MC), which are known *inter prediction* techniques. See Section II.B (explaining that motion estimation and motion compensation are inter prediction techniques); EX2011, ¶¶89, 92, 96; EX2012, ¶¶72-73 (Petitioner’s expert in a parallel proceeding admitting that VCEG-AJ21 applies solely to *inter* prediction); EX2014, 24-25 (meeting notes accompanying VCEG-AJ21 confirming intra prediction will be reserved for “further study” and is “not yet addressed”). VCEG-AJ21 further confirms that its techniques are only meant to be applied to *inter* prediction when examining the possible partition block modes

provided for the 128x128, 64x64 and 32x32 sizes. EX1008, 4. Specifically, VCEG-AJ21 addresses *inter* prediction when extending the H.264 macroblock syntax:

The mb_type in the MB syntax of the current H.264 is defined for the MB size of 16x16 and its partitions. The small numbers (0, 1) of mb_type are assigned for the large block modes (SKIP, *Inter_16x16*) while large numbers (5, 6, 7) are assigned for the block modes (*Inter_8x4*, *Inter_4x8*, *Inter_4x4*) of relatively small sizes.

EX1008, 4.

In this manner, VCEG-AJ21 only describes *inter prediction* techniques, and not only provides no suggestion that any of its techniques would be applicable to *intra prediction*, but in fact deliberately avoids applying its techniques to *intra prediction*.

VII. REASONS TO DENY INSTITUTION (ALL GROUNDS; ALL INDEPENDENT CLAIMS)

A. Petitioner improperly relies on expert testimony to supply a missing claim limitation in violation of Rule 104(b)(4).

The Director should deny institution because the Petition explicitly relies on expert testimony, and not on prior-art patents or printed publications, to allegedly supply a missing claim limitation. This amounts to a failure to comply with 37 C.F.R. §42.104(b)(4), which requires “[t]he petition must specify where each element of the claim is found *in the prior art patents or printed publications* relied

upon.” The Office has set forth explicitly in a July 2025 Memorandum regarding the “Enforcement and Non-waiver of 37 C.F.R. § 42.104(b)(4),” that “[p]er 35 U.S.C. §312(a)(4), the Board³ shall deny an IPR petition that fails to comply with Rule 104(b)(4).” *See* EX2008, 1.

The Petition presents two major violations of Rule 104(b)(4): (1) inventing out of whole cloth new 32×32-based parameters not described in Xiong and (2) inventing new 64×64-based parameters not described in either Xiong or VCEG-AJ21. These parameters are not found in the art and amount to Petitioner relying solely on expert testimony to address the claimed “*large block [having] a block size equal to or larger than 32×32, and the large block size is greater than a size of a basic coding unit*” as well as applying “*an intra prediction mode for the large block that is not further split into four equally sized sub-blocks.*”

First, all of Petitioner’s theories and its application of Xiong to large blocks (32×32) are premised on signaling parameters like “ext_32x32_pred_flag” and

³ Effective October 20, 2025, the Director determines whether to institute trial in an IPR. *See* USPTO Memorandum (Squires), “Director Institution of AIA Trial Proceedings” (Oct. 17, 2025), available at https://www.uspto.gov/sites/default/files/documents/Director_Institution_of_AIA_Trial_Proceedings.pdf.

“ext_32x32_pred_mode” that do not exist in Xiong. *See* Pet., 21, 26, 28-32. For example, Petitioner argues that “a POSITA would have understood from Xiong’s teachings of using ext_16x16_pred_flag to indicate splitting of a 16x16 block into 8x8 subblocks, that when using a 32x32 macroblock, ***there would also be an ext_32x32_pred_flag.***” Pet., 26 (citing EX1003, ¶76). In this manner, Petitioner acknowledges that no such parameter exists in Xiong but instead relies on expert testimony and the alleged knowledge of a POSITA to simply assert that 32×32-based parameters would exist. Although Xiong states in passing that macroblocks may also exist as 32×32 macroblocks, Xiong does not explain *how to apply its techniques* to 32×32 macroblocks, let alone describe any of the new signaling parameters (e.g., “ext_32x32_pred_flag” and “ext_32x32_pred_mode”) recited in the Petition. Pet., 22 (citing EX1006, 6). Rather, Petitioner expressly depends on Dr. Acton’s conjecture that a “POSITA would have understood” that new syntax elements and modes would have been added and then treats that conjecture as if it were a teaching of the prior art. Pet., 21, 26, 28-32 (citing EX1003, ¶¶67-69, 76-77, 81-83, 87-89). Not only are Dr. Acton’s theories impermissible hindsight, Petitioner’s reliance on these theories violates Rule 104(b)(4) because Petitioner relies solely on expert testimony to supply a missing claim limitation when Xiong provides no teaching of such parameters.

Second, Petitioner’s theories related to 64×64 macroblocks and the new

parameters “ext_64x64_pred_flag” and “ext_64x64_pred_mode” are similarly not found in the art. *See* Pet., 21, 26-32 (citing EX1003, ¶¶67-69, 76-77, 81-84, 88-89). For example, Petitioner asserts that “for a 64x64 block, *there would be a flag* (e.g., ext_64x64_pred_flag) that indicates that block should be partitioned into four 32x32 sub-blocks.” Pet., 26-27 (citing EX1003, ¶77). Again, Petitioner simply asserts that such parameters would exist without providing or relying on any explicit disclosure in the art. Rather, the combination of Xiong and VCEG-AJ21 still does not disclose or suggest any such parameters or how such parameters would be applied to 64×64 macroblocks. Again, Petitioner must depend on Dr. Acton’s conjecture that a “POSITA would have understood” that new syntax elements and modes would have been added, and then treats that conjecture as if it were a teaching of the prior art. *See* Pet., 21, 26-32. Dr. Acton’s theories regarding 64×64 macroblocks are again impermissible hindsight, and Petitioner’s reliance on these theories to supply claim limitations missing from Xiong and VCEG-AJ21 also violates Rule 104(b)(4). As further explained below, neither Xiong nor VCEG-AJ21 describe such parameters or their application to intra prediction modes. Section VII.B.

Because Petitioner relies on Dr. Acton’s testimony alone to argue that it would have been obvious to expand Xiong’s and VCEG-AJ21’s teachings to create new 32×32- and 64×64-based parameters for intra prediction—despite no such

teachings existing in the art—Petitioner has violated Rule 104(b)(4). These violations impact all of the independent claims, which recite intra prediction for a *large block*. EX1001, Cls. 1, 5, 11, 15. The Director should therefore deny institution for at least this reason. EX2008, 1.

B. The combination of Xiong and VCEG-AJ21 fails to render obvious “*an intra prediction mode for the large block that is not further split into four equally sized sub-blocks.*”

The proposed combination of Xiong and VCEG-AJ21 also fails to render obvious any of the challenged independent claims at least because the combination fails to teach or suggest “*an intra prediction mode for the large block that is not further split into four equally sized sub-blocks,*” as recited in independent claims 1, 5, 11, and 15.

Petitioner relies exclusively on the conclusory testimony of Dr. Acton to bridge the technical gaps in the prior art, Pet., 27-30 (citing EX1003, ¶¶81-85), but even with the aid of Dr. Acton’s unsupported testimony, neither reference, alone or in combination, discloses or renders obvious this limitation.

1. Xiong does not disclose applying an *intra prediction mode for a large block* ($\geq 32 \times 32$) that is not further split.

Xiong does not disclose applying an “*intra prediction mode for the large block that is not further split into four equally sized sub-blocks.*” As recited in the independent claims, the “*large block has a block size equal to or larger than 32×32 .*” Because Xiong only describes intra prediction methods that apply to

smaller-sized blocks (e.g., 4×4 , 8×8 , and 16×16), Xiong does not teach or address applying an intra prediction mode for *a large block that is greater than or equal to 32×32* and is not further split into smaller sub-blocks.

First, as discussed in Section VI.A, Xiong describes three types of intra prediction methods or “intra frame prediction encoding”:

- (1) H.264/AVC;
- (2) Displacement for H.264/AVC; and
- (3) Template Matching.

EX1006, 1-2, FIG. 5. But Xiong only describes applying these three types of intra prediction methods to block sizes of 4×4 , 8×8 , and 16×16 . *Id.* Nowhere does Xiong explain that these intra prediction methods would apply to—or *how* they would be applied—to larger block sizes like 32×32 .

For example, and as discussed above in Section VI.A.1, for the first intra prediction method specified by the H.264/AVC standard, Xiong only states that “H.264/AVC supports intra frame prediction for 4×4 , 8×8 , and 16×16 pixel macroblocks.” EX1006, 1. Examining the H.264/AVC standard itself confirms this understanding. EX1010, §8.3. Therefore, Xiong does not describe applying this same intra prediction method to a larger 32×32 block.

Similarly, Xiong’s discussion of the second intra prediction method—*displacement intra prediction (DIP)*—applies to H.264/AVC and is therefore also

only described as applying to 4×4 , 8×8 , and 16×16 sizes. EX1006, 2. Again, Xiong does not describe applying DIP to a larger 32×32 block.

And finally, Xiong's discussion of the third intra prediction method—*template matching*—also does not apply to larger blocks of size 32×32 or greater. Indeed, Xiong limits template matching to just *4×4 and 8×8* sizes: “This template matching method can serve as an additional mode for H.264/AVC, and it is applicable to intra 4×4 blocks or intra 8×8 prediction blocks.” EX1006, 2.

In this manner, Xiong only describes intra prediction methods for block sizes up to 16×16 and does not describe applying any intra prediction method to a “*large block*” (i.e., block size equal to or larger than 32×32) “*that is not further split into four equally sized sub-blocks.*”

Second, Xiong's intra prediction syntax signaling also demonstrates that Xiong does not teach signaling an intra prediction mode for larger blocks of size 32×32 or greater. For example, Xiong describes `ext_16x16_pred_mode` as indicating “the intra frame prediction encoding method for a macroblock partitioned as 16×16 .” EX1006, 8. Additionally, Xiong describes “`ext_8x8_pred_mode`” and “`ext_4x4_pred_mode`” fields. *Id.* But none of these fields describe any intra prediction signaling for a larger block of size 32×32 or greater. Rather, as explained in Section VII.A, Petitioner relies on expert testimony to fill this gap and to invent out of whole cloth a new field

(“ext_32x32_pred_mode”) that is not present in Xiong. Pet., 30. But Xiong’s failure to describe any syntax signaling that identifies an intra prediction mode for a “large block” (e.g., a block $\geq 32 \times 32$) is further indication that Xiong does not teach the claimed intra prediction mode.

To address this deficiency, Petitioner relies on Xiong’s statement that the macroblocks discussed are “not necessarily limited to a 16×16 macroblock” and “can also be of other sizes, such as a 32×32 macroblock.” Pet., 22 (citing EX1006, 6). But this statement still does not address or identify a particular *intra prediction mode* that should be applied to a 32×32 block. Rather, the context of the “ 32×32 macroblock” statement is directed to *partitioning*. See EX1006, 6 (describing the dividing of macroblocks into sub-blocks rather than particular intra prediction modes). The understanding that this passing mention of 32×32 macroblocks does not indicate how intra prediction modes would apply to these large block sizes is further emphasized by the fact that Petitioner again had to invent an entirely new parameter not disclosed in Xiong—“ext_32x32_pred_mode” (Pet., 29-30)—to allegedly show how 32×32 macroblocks could be addressed. Section VII.A.

Therefore, Xiong’s passing reference to 32×32 macroblocks, in the context of partitioning and not intra prediction modes, without more, fails to demonstrate that Xiong teaches applying any intra prediction mode to a “*large block*” (i.e., block size equal to or larger than 32×32) “*that is not further split into four equally sized*

sub-blocks.”

In this manner, nothing in Xiong suggests applying an *intra prediction mode* to a large block having a size of a 32×32 or greater. Thus, Petitioner has failed to demonstrate that Xiong teaches this claim element, and Grounds 1A-1B fail for at least this reason.

2. VCEG-AJ21, in combination with Xiong, also does not teach applying an *intra prediction mode* for a large block ($\geq 32 \times 32$).

Appearing to recognize Xiong’s deficiencies, Petitioner presents an alternative theory based on the combination of Xiong with VCEG-AJ21 and an alleged “64x64 macroblock.” Pet., 29-30. But the combination is still deficient because VCEG-AJ21 does not describe any *intra* prediction methods, and thus certainly does not describe applying any intra prediction methods to large blocks. See Section VI.B.

Petitioner cites VCEG-AJ21 for its teaching of “large blocks” and a “hierarchical structure.” Pet., 19-20. However, VCEG-AJ21 is exclusively directed to *inter prediction* and explicitly does not apply to *intra prediction*. VCEG-AJ21, 1. Indeed, in a parallel proceeding, Petitioner’s declarant admits that “VCEG-AJ21 is focused on *enlarged macroblocks for inter prediction*,” that its teachings “*are explicitly for inter prediction*,” and that intra prediction is not addressed. EX2012, ¶¶72-73. To confirm this understanding, VCEG-AJ21 states:

In this proposal, the extended architecture with the enlarged MB structure are *first proposed for ME&MC [motion estimation (ME) and motion compensation (MC)]* but *new designs of* transform kernels, *intra prediction*, luma/chroma DC transforms, CABAC context models and de-blocking filters for the enlarged MB *are not yet addressed*.

EX1008, 1; EX2014, 24-25 (meeting notes accompanying VCEG-AJ21 confirming intra prediction will be reserved for “further study” and is “not yet addressed”).

The motion estimation (ME) and motion compensation (MC) techniques disclosed in VCEG-AJ21 are known *inter prediction* techniques. *See* Section II.B

(explaining that motion estimation and motion compensation are inter prediction techniques); EX2011, ¶¶89, 92, 96; EX2012, ¶¶72-73 (Petitioner’s expert in a parallel proceeding admitting that VCEG-AJ21 applies solely to *inter* prediction).

As previously explained, *inter* prediction significantly differs from *intra* prediction. Section II.B. *Inter* prediction targets movement tracking across temporal frames while *intra* prediction extrapolates from spatial neighbors within a single frame. EX2011, ¶89; Section II.B (explaining that *intra* prediction exploits redundancies *within the same image* while *inter* prediction exploits redundancies *between different images*).

Because VCEG-AJ21 solely discusses enlarged blocks for *inter* prediction purposes, VCEG-AJ21 cannot cure Xiong’s deficiencies and cannot supply the missing *intra* prediction mode teachings. Crucially, and despite Petitioner’s

theories to the contrary, VCEG-AJ21 cannot simply “extend Xiong’s hierarchical block structure to larger blocks” (Pet., 20) because VCEG-AJ21 explicitly states that its enlarged macroblock techniques apply solely to ***inter prediction*** techniques. EX1008, 1. Thus, even when combined with Xiong, the combination does not teach applying “*an intra prediction mode for the large block that is not further split into four equally sized sub-blocks.*”

C. The combination of Xiong and VCEG-AJ21 fails to render obvious “a second syntax element indicating a single spatial intra partition type for at least one basic coding unit sized sub-block.”

The proposed combination of Xiong and VCEG-AJ21 also fails to render obvious any of the challenged independent claims at least because the combination fails to teach or suggest “*a second syntax element indicating a single spatial intra partition type for at least one basic coding unit sized sub-block,*” as recited in independent claims 1, 5, 11, and 15.

Petitioner alleges that Xiong’s ext_16×16_pred_flag is the claimed “*second syntax element indicating a single spatial intra partition type.*” Pet., 32-33.

Petitioner further alleges that if “ext_16×16_pred_flag” does not alone meet this limitation of indicating a single spatial intra partition type, “the combination of ext_16×16_pred_flag and ext_8×8_pred_flag indicate [*sic*] the partition size.” Pet., 34. But Petitioner’s position is wrong as it improperly attempts to equate Xiong’s ext_16×16_pred_flag to both the claimed *binary split signaling syntax* **and** the

claimed *second syntax element indicating a single spatial intra partition type for at least one basic coding unit sized sub-block*.

Petitioner's theory regarding Xiong's ext_16×16_pred_flag fails even under its own articulation of the prior art. Notably, Petitioner relies on the ext_16×16_pred_flag to argue that Xiong's disclosure of that flag would have rendered it obvious to a POSITA to introduce a *separate*, higher-level "binary split signaling syntax element" (e.g., a hypothetical ext_32×32_pred_flag) for a 32×32 block to meet claim element 1[b]. Pet., 25-27. This framing is fatal to Petitioner's attempt to use ext_16×16_pred_flag as the "*second syntax element*" of element 1[e].

Claim 1 expressly recites **two syntax elements**. Element 1[b] requires decoding "*a binary split signaling syntax element specifying that the large block is further split into four equally sized sub-blocks*." Element 1[e] separately requires decoding "*a second syntax element indicating a single spatial intra partition type for at least one basic coding unit sized sub-block*." The claim thus requires both (i) structural distinctness (a *second* syntax element) and (ii) functional distinctness (split signaling versus spatial intra partition type signaling).

Under Petitioner's own theory, the syntax element that performs the split-signaling function for the large block is *not* disclosed in Xiong at all, but is instead an *obviousness-based extrapolation* from ext_16×16_pred_flag. Pet., 25-

27. Once Petitioner assigns that extrapolated `ext_32×32_pred_flag` to element 1[b], `ext_16×16_pred_flag` cannot simultaneously be elevated to satisfy element 1[e]. Doing so would collapse two expressly distinct claim limitations into a single disclosed flag—contrary to the claim language and to Petitioner’s own mapping. Thus, Petitioner’s reliance on Xiong’s `ext_16×16_pred_flag` to derive the “*binary split signaling syntax*” **and** to act as the “*second syntax element*” is erroneous and fails to demonstrate a teaching of the two specific syntax elements recited in the claims.

D. Petitioner’s motivation to combine Xiong and VCEG-AJ21 is hindsight-driven and ignores the technical context of the references.

Petitioner’s obviousness theory is a classic example of hindsight bias that “uses the patent in suit as a guide through the maze of prior art.” *In re NTP, Inc.*, 654 F.3d 1279, 1299 (Fed. Cir. 2011); M.P.E.P. § 2143.01. Specifically, Petitioner argues that a “POSITA would have been motivated to combine Xiong and VCEG-AJ21 to extend Xiong’s hierarchical block structure to larger blocks, including 64x64 and 128x128.” Pet., 20-22. But Petitioner’s attempt to “extend” Xiong’s intra prediction logic to the larger block sizes in VCEG-AJ21 fails to provide any non-hindsight reason why a POSITA would merge these two fundamentally incompatible technical domains to result in the claimed techniques.

First, Petitioner improperly conflates *intra* prediction optimization with an

inter prediction framework. Xiong is strictly focused on *intra* prediction techniques and “using at least two kinds of intra frame prediction encoding methods” so that “different blocks can be encoded using the most appropriate method.” EX1006, 3-4. Specifically, Xiong recognizes that H.264/AVC only “supports intra frame prediction for 4×4, 8×8, and 16×16 pixel macroblocks.” EX1006, 1. In contrast, VCEG-AJ21 is a motion-estimation (*inter* prediction) reference that expressly states that *intra* prediction is “not yet addressed.” EX1008, 1; EX2012, ¶¶72-73 (Petitioner’s expert in a parallel proceeding admitting that VCEG-AJ21’s teachings “*are explicitly for inter prediction*” and that *intra* prediction is not addressed).

But as explained in Sections II.B and VII.B.2 *inter* prediction and *intra* prediction are distinct algorithms that address different scenarios: *inter* prediction targets movement tracking across different temporal frames while *intra* prediction extrapolates from spatial neighbors within a single frame. *See* Section II.B. Petitioner offers no explanation why a POSITA would have been motivated to merge Xiong’s intra prediction techniques with the inter prediction macroblock expansion described in VCEG-AJ21—especially when VCEG-AJ21 expressly leaves intra prediction for another day.

Second, Petitioner’s simple extension argument (Pet., 20-22) ignores the significant technical hurdles inherent in modifying block sizes. For example,

Petitioner argues that a POSITA would have been motivated to “extend Xiong’s hierarchical block structure to larger blocks” and that Xiong’s “hierarchical structure and related syntax is easily expanded using routine engineering principles.” Pet., 20-21. But VCEG-AJ21 itself admits that enlarging macroblocks even for its *intended* purpose of *inter* prediction is a complex task requiring complex trade-offs regarding: “fair comparison,” “backward compatibility,” additional “side information,” etc. EX1006, 2. If enlarging macroblocks for its *intended* purpose (inter prediction) was non-trivial, it is pure speculation to suggest a POSITA would seamlessly “plug and play” larger macroblock sizes into the unaddressed domain of intra prediction. Petitioner fails to explain or address how a POSITA would have successfully combined Xiong’s specific *intra* prediction techniques with the *inter* prediction environment of VCEG-AJ21, particularly when VCEG-AJ21 provides no roadmap for *intra* prediction implementation.

Third, the state of the art at the time of the invention confirms that applying *inter* prediction block sizes to *intra* prediction was not simple or well-known. The H.264 standard and extensions to the standard treated inter prediction and intra prediction differently and with intentional asymmetry. For example, as the ’876 patent explains, extensions to the H.264 standard described large block (32x32 and 64x64) partitioning for *inter* prediction processes but no such partitioning was described for *intra* prediction processes. EX1001, 3:18-25; EX1010, 122-143

(H.264 standard § 8.3 using only 16x16, 8x8, and 4x4 for *intra* prediction);

EX1006, 1. This disparity demonstrates that “extending” block sizes was not a matter of “simple common sense” or a “predictable result,” as Petitioner baldly suggests, but a departure from the established standards. *KSR Int’l Co. v. Teleflex Inc.*, 550 U.S. 398 (2007).

Because Petitioner fails to show why a POSITA would have been motivated to merge an intra prediction signaling method with an inter prediction macroblock expansion—especially when the latter expressly leaves intra prediction for another day—Petitioner has failed to show that a POSITA would have been motivated to combine Xiong and VCEG-AJ21. Thus, Petitioner has not demonstrated a reasonable likelihood of prevailing on any Grounds for this additional reason.

VIII. CONCLUSION

The Petition fails to show a reasonable likelihood that any of the challenged claims is unpatentable as obvious in view of the cited art and, therefore, the Director should deny institution.

Respectfully submitted,

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CERTIFICATE OF WORD COUNT (37 C.F.R. § 42.24(d))

1. This Patent Owner Preliminary Response complies with the type-volume limitation of 14,000 words, comprising 8,467 words, excluding the parts exempted by 37 C.F.R. § 42.24(a)(1).

2. This Patent Owner Preliminary Response complies with the general format requirements of 37 C.F.R. § 42.6(a) and has been prepared using Microsoft® Word 2016 in 14-point Times New Roman font.

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CERTIFICATE OF SERVICE (37 C.F.R. § 42.6(e))

I certify that the above-captioned **PATENT OWNER PRELIMINARY RESPONSE UNDER 37 C.F.R. § 42.107(a)** and associated Exhibits 2011-2014 were served in their entireties on April 14, 2026, upon the following parties via electronic mail:

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