

UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE PATENT TRIAL AND APPEAL BOARD

GOOGLE LLC,

Petitioner,

v.

ADVANCED CODING TECHNOLOGIES, LLC,

Patent Owner.

Patent No. 8,090,025

Filing Date: April 17, 2007

Issue Date: January 3, 2012

Inventor: Satoru Sakazume

Title: MOVING-PICTURE CODING APPARATUS, METHOD
AND PROGRAM, AND MOVING-PICTURE DECODING
APPARATUS, METHOD AND PROGRAM

PATENT OWNER'S PRELIMINARY RESPONSE

Case No. IPR2025-00998

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LIST OF EXHIBITS

Exhibit No.	Description of Document
2001	Google LLC’S Second Amended Invalidity and Subject Matter Eligibility Contentions in <i>Advanced Coding Techs. LLC v. Google LLC</i> , Case No. 2:24-cv-00353-JRG (E.D. Tex.), dated April 11, 2025
2002	Advanced Coding Technologies LLC’s Fourth Amended Disclosure of Asserted Claims and Infringement Contentions in <i>Advanced Coding Techs. LLC v. Google LLC</i> , Case No. 2:24-cv-00353-JRG (E.D. Tex.), dated December 20, 2024
2003	Advanced Coding Technologies LLC’s Disclosure of Asserted Claims and Infringement Contentions in <i>Advanced Coding Techs. LLC v. Google LLC</i> , Case No. 2:24-cv-00353-JRG (E.D. Tex.), dated July 5, 2024
2004	Joint Claim Construction and Prehearing Statement, Dkt. 63, <i>Advanced Coding Techs. LLC v. Google LLC</i> , Case No. 2:24-cv-00353-JRG (E.D. Tex.), filed June 24, 2025
2005	U.S. Patent No. 8,090,025 to Sakazume (the ’025 Patent), issued January 3, 2012, with Certificate of Correction, signed and sealed October 4, 2022
2006	“Improvement of DCT-based Compression Algorithms Using Poisson’s Equation,” Katsu Yamatani and Naoki Saito, Senior Member, IEEE, pp. 1-38, September 12, 2005

I. INTRODUCTION

On May 12, 2025, Apple Inc. (“Petitioner” or “Apple”) submitted a Petition (Paper 1, “Petition” or “Pet.”) to institute *inter partes* review (“IPR”) of U.S. Patent No. 8,090,025 (Ex. 1001, the “’025 Patent”), challenging Claims 1-10 (the “Challenged Claims”). The Petition asserts that (i) Claims 2, 5, 6, and 8 are rendered obvious over Al-Mualla, et al., “Video Coding for Mobile Communications: Efficiency, Complexity and Resilience,” Elsevier, 2002 (“Ex. 1005” or “Mualla”), S. Shirani, et al., “A Concealment Method for Video Communications in an Error-Prone Environment,” in IEEE Journal on Selected Areas in Communications, Vol. 18, No. 6, pp. 1122-1128, June 2000 (“Ex. 1006” or “Shirani”), N. Saito, et al., “The Polyharmonic Local Sine Transform: A New Tool for Local Image Analysis and Synthesis without Edge Effect,” Applied and Computational Harmonic Analysis, Vol. 20, pp. 41-73, January 2006 (“Ex. 1007” or “Saito”), and U.S. Patent No. 4,743,967 (“Ex. 1023” or “Takenaka”); and Claims 1, 3, 4, 7, and 9-10 are rendered obvious over Mualla in view of Shirani and Saito. Pet. at 1. The Board should deny the Petition for at least the reasons described briefly below.

Petitioner fails to show that any combination of Mualla, Shirani, Saito, and Takenaka discloses at least “the input signal being obtained by multiplexing a coded bitstream obtained by predictive coding, border motion-vector data and post-quantization data obtained by quantization in the predictive coding,” “obtaining a

boundary condition of each of a plurality of borders between the rectangular zones and another plurality of rectangular zones adjacent to the rectangular zones,” “finding a border, of the reference picture, having a boundary condition that matches the boundary condition, by motion-vector search in the reference picture,” “and generating the border motion-vector data that is data on a motion vector from a border of the rectangular zone in the picture to be coded to the border of the reference picture thus found, defining a boundary condition of a border that corresponds to the border motion vector data, from the reference picture based on the border motion-vector data,” “an entropy decoder to perform entropy decoding to the data thus demultiplexed to generate, at least, motion-vector data, the post-quantization data, the border motion-vector data and parameter data required for constructing a specific syntax structure,” “a zone-border motion compensator to define a boundary condition of a border that corresponds to the border motion vector data, from the reference picture based on the border motion-vector data, and generate an estimated video signal in each rectangular zone in the picture to be coded, that satisfies Poisson’s Equation, thus producing a first predictive picture,” “a motion compensator to specify a corresponding rectangular zone in the reference picture based on the motion-vector data, thus generating a second predictive picture,” “a selector to select either the first predictive picture or the second predictive picture and supply the predictive picture thus selected to the combiner,” and “a decoding

controller to receive decoding control data for decoding control from the parameter data and control the selector to switch the predictive picture to be supplied to the combiner between the first and second predictive pictures according to the decoding control data,” as required by the Challenged Claims.

First, the Petition is deficient because it does not show that the claim limitation of “border motion-vector data” is properly construed. Specifically, Petitioner incorrectly proposes that the “border motion-vector term” is met by Shirani’s disclosure of “motion vectors of available neighboring blocks” but Shirani is silent regarding whether the motion vectors of available neighboring blocks are at a border, let alone determining a “best-matched border in the reference picture,” as required by a proper construction of “border motion-vector data.” Further, Shirani explicitly teaches away from “edge-based methods” as being “computationally more intensive.”

Second, Petitioner’s Grounds fail to disclose the claimed “boundary condition” since “border motion-vector data . . . defin[es] a boundary condition and Petitioner’s Grounds do not disclose “border motion-vector data.” Further, the Petition is deficient because it does not properly construe the claimed “boundary condition.” In fact, the Petition does not even attempt to disclose “gradient data” in the context of the “boundary condition” claim limitations.

Third, the Petition is deficient because its proposed combination of Mualla, Shirani, Saito, and Takenaka does not disclose two different motion compensation models in the same system or demonstrate a motivation to combine references to create a system with two different motion compensation models, and therefore cannot disclose a “*second* predictive picture” that is the result of a second motion compensation model in the same system as the first motion compensation model.

Fourth, the Petition is also deficient because Petitioner fails to show how its proposed combination of Mualla, Shirani, Saito, and Takenaka discloses “a selector to select either the first predictive picture or the second predictive picture.” Instead, Petitioner relies on vague citations to various references (Mualla, Girod, and Takenaka) and illogical leaps to assume that its proposed combination discloses two motion compensation models that work one at a time depending on a certain amount of error. However, there is no implication about even switching from traditional motion compensation to error concealment motion compensation or selecting between two predictive pictures that are output from each of the two motion compensation systems. Takenaka only discloses selecting between predictive function computing circuits, one of which is a motion compensation circuit. Because Claim 1 requires two motion compensation methods to select from, the Petition fails to show how Takenaka remedies the deficiencies of Mualla-Shirani-Saito with respect to Claim 6.14 and 6.15.

Accordingly, the Board should deny institution of the Petition

II. THE '025 PATENT

The '025 Patent relates to encoding and decoding video information by using a boundary condition obtained between blocks, or pieces, of the individual images that comprise a video. '025 Patent, 1:18-22. The '025 Patent discusses problems with motion compensation known in the prior art at the time. For example, pictures can be divided into blocks but objects inside these blocks do not always stay the same as they move: objects can move more than expected, objects can deform as they move, or objects can disappear or appear between frames. *Id.*, 1:28-54. The '025 Patent describes an existing solution, which was to use a filter to “adaptively smooth” the data on the border of the blocks to compensate for motion. *Id.*, 1:55-2:26. According to the '025 Patent, this known “smoothing filter” has disadvantages, including doing too much smoothing, which results in lower texture quality in an image block. *Id.*

Rather than using a smoothing filter on the borders of the blocks, the '025 Patent discusses a “zone border motion compensator” that estimates a predictive picture based on matching “boundary conditions.” *Id.*, 2:30-67.

The '025 Patent's boundary condition is based on border motion-vector data, which is defined in the '025 Patent:

[Z]one-border motion-vector data 1407 [] is a difference in spatial position between the border of the block that is the object to be predicted 1403 in the picture to be coded

1402 and the best-matched border 1406 in the reference picture 1402.

'025 Patent, 11:15-19.

The '025 Patent's zone-border motion compensation produces a predictive picture maintaining smooth continuity of a video signal. *Id.*, 11:56-12:11. This predictive picture is an estimated signal generated through applying a source model with a boundary condition to Poisson's Equation, where the source model is provided by the system and based on the way local values change in the actual signal, and the boundary condition represents data related to pixels for the estimated signal that are used by the equation to solve for the estimated signal. *Id.*, 11:39-12:3, 14:12-52. Matching both the boundary condition and the source model results in a smooth estimated signal at the boundary that was solved. *Id.*

The preferred embodiment of the '025 Patent explicitly confirms that the word "satisfies . . ." indicates using *the concept* of Poisson's Equation *analytically*, not necessarily implementing a mathematical algorithm that actually computes Poisson's Equation:

"Obtained next is an estimated signal in a block to an original signal *with the concept of Poisson's Equation.*"

'025 Patent, 14:12-13 (emphasis added).

Accordingly, this embodiment implements the source model in generation of an estimated signal in a block ***analytically without mathematically solving*** Poisson’s Equation with a huge amount of calculation.

Id., 11:66-12:3 (emphasis added).

The ’025 Patent describes that “satisfies Poisson’s Equation” only means that the Laplacian of the estimated video signal ‘u’ may be represented as an expression of ‘Kj’ with one example being a DCT-series representation of the estimated signal, as below:

The estimated signal ‘u’ in a block can be expressed as an expression (5) with Neumann’s boundary condition and DCT series representation, which is given by addition of DCT-series expanded components of the estimated signal from each border, as indicated by an expression (6).

$$\begin{aligned}
 u(x, y) &= u^{(1)}(x, y) + u^{(2)}(x, y) + u^{(3)}(x, y) + u^{(4)}(x, y) \\
 &= \sqrt{\frac{2}{N}} \sum_{k=1}^{N-1} \lambda_k \{ G_k^{(1)} \psi_k(y-1) + G_k^{(2)} \psi_k(y) \} \cos \pi k x + \\
 &\quad (G_k^{(3)} \psi_k(x) \cos \pi k y) + C,
 \end{aligned}$$

in which C is a constant, and

$$\psi_k(t) = \begin{cases} \frac{t^2}{2} & \dots k = 0 \\ \frac{\cosh \pi k t}{\pi k \sinh \pi k} & \dots k \neq 0 \end{cases} \quad (5)$$

$$\begin{aligned}
 u^{(1)}(x, y) &:= \sqrt{\frac{2}{N}} \left(\frac{G_0^{(1)} (y-1)^2}{\sqrt{2}} + \right. \\
 &\quad \left. \sum_{k=1}^{N-1} G_k^{(1)} \frac{\cosh \pi k (y-1)}{\pi k \sinh \pi k} \cos \pi k x \right) \quad (6)
 \end{aligned}$$

Id., 14:19-45. The ’025 Patent specification then states that such a generation method is “just an example.”

The zone-border motion compensator 119 in the first embodiment obtains a predictive signal (an estimated signal) with $u(x, y)$ according to the expression (5). This predictive signal (estimated signal) generation method is ***just an example***, and hence the present invention is not limited to this generation method. In other words, ***$u(x, y)$ can be obtained by any higher-speed calculation method that satisfies $\Delta u_j = K_j$.***

'025 Patent, 14:47-53 (emphasis added). In other words, any generation method that results in the representation of the Laplacian of 'u' as an expression of ' K_j ,' a source term based on boundary condition(s), "satisfies" Poisson's Equation instead of mathematically solving Poisson's Equation.

III. THE ALLEGED PRIOR ART

A. Mualla

Mualla is directed to "mobile multimedia communications," which have "many technologically demanding problems [that] need to be solved before real-time mobile video communications can be achieved. When such challenges are resolved, a wealth of advanced services and applications will be available to the mobile user." Ex. 1005, 9. Mualla "concentrates on three main challenges" of "[h]igher coding efficiency," "[r]educed computational complexity," and "[i]mproved error resilience." *Id.*

Mualla describes a “typical video codec,” as shown below:

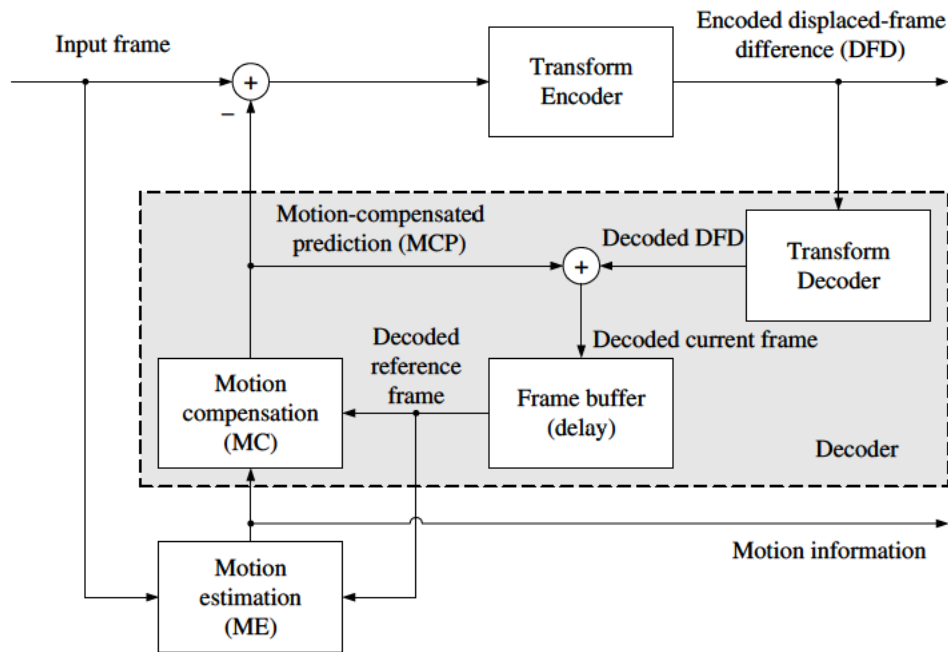


Figure 1.1: Typical video codec

Id., Figure 1.1. Mualla also discloses “motion-compensated error concealment” as a possible adaptation to the “typical video codec,” but not as an integration with such a codec. *See Id.*, 27 (“Careful examination of this [typical] codec (as will be detailed in subsequent chapters) reveals that a *motion-based approach* can be adopted to provide suitable solutions for the three challenges of higher coding efficiency, reduced complexity, and error resilience.”).

In describing its motion-compensated error concealment, Mualla explains that “[w]hen an error is detected, the decoding process is stopped, the decoder searches for the next synchronization codeword, and decoding is resumed. All macroblocks

between the point where the error was detected and the synchronization point are marked as damaged macroblocks.” *Id.*, 265.

B. Shirani

Shirani “propose[s] a two-stage error-concealment method for block-based compressed video which was transmitted in an error-prone environment. In the first stage, we obtain initial estimates of the missing blocks. If the motion vectors associated with the missing blocks are available, motion compensation is used to provide good estimates. Otherwise, a novel algorithm which preserves image continuity is used to estimate the blocks. In the second stage, a maximum *a posteriori* (MAP) estimator, which employs an adaptive Markov random field (MRF) as the image, *a priori* model, is used to improve the video reconstruction quality.” Ex. 1006, 1.

Shirani discloses “motion vectors of available neighboring blocks” in order to “obtain an initial estimate of [a] missing block that smoothly connects to the rest of the image” by selecting a block that “minimizes the squared sums of border errors.” *See id.*, 3.

Shirani describes a system that is different from “edge-based methods” that are “computationally more intensive”:

In [4], each pixel in a damaged block is interpolated from the corresponding pixels in its four neighboring blocks such that the total squared border error is minimized. In

[5] and [6], the missing information is interpolated utilizing spatially correlated edge information from a large local neighborhood. Note that *although these edge-based methods are generally more accurate than other approaches, they are computationally more intensive. In [7], a computationally simple, spatial directional interpolation scheme has been proposed.*

Id., 1 (emphasis added).

C. Saito

Saito “introduce[s] a new local sine transform that can completely localize image information both in the space domain and in the spatial frequency domain.”

Ex. 1007, Abstract.

Part of Saito’s disclosure relates to using Polyharmonic Local Cosine Transform (PHLCT) as a mathematical solution of Poisson’s Equation, and specifically, explaining that the polyharmonic component is “obtained by solving the elliptic boundary value problem associated with the so-called polyharmonic equation (e.g., Laplace’s equation, biharmonic equation, etc.) given the boundary values.” *Id.*, Abstract, 4. Saito further explains that “we shall *solve* the following Poisson equation with the Neumann boundary condition” and even that “this method of course requires to estimate the first order normal derivative of data at the boundary.” *Id.*, 27. Saito’s requirement to perform complex mathematics in order to “solve” for Poisson’s equation stems from its citation to Saito-2005 (considered during prosecution of the ’025 Patent), as shown below:

6.2.2. Use of the Neumann boundary condition

It is possible to use the *Neumann boundary condition* instead of the Dirichlet condition in (3). This will give us the $O(\|k\|^{-4})$ decay rate of the v_j components instead of $O(\|k\|^{-3})$ in the case of the Dirichlet boundary condition. To do so, we need to modify (3); we shall solve the following *Poisson equation* with the Neumann boundary condition:

$$\begin{cases} \Delta u_j = K_j & \text{in } \Omega_j, \\ \frac{\partial u_j}{\partial v} = \frac{\partial f_j}{\partial v} & \text{on } \partial\Omega_j, \end{cases} \quad (13)$$

where K_j is a constant that needs to be computed as follows:

$$K_j = \frac{1}{|\Omega_j|} \int_{\partial\Omega_j} \frac{\partial f_j}{\partial v} ds,$$

which is the boundary integral of $\partial f_j / \partial v$ normalized by $|\Omega_j|$ (the volume of the domain). This constant K_j is necessary for (13) to have a unique solution (modulo an additive constant); see, e.g., [43, p. 84]. The solution u_j is not just a function having the same normal derivative at the boundary with the original function f_j ; one can show that it is *the minimizer of the total squared curvature integral* on the domain Ω_j . Once we get the solution u_j , the residual function $v_j = f_j - u_j$ clearly satisfies $\partial v_j / \partial v = 0$ on $\partial\Omega_j$. Assuming that $f_j \in C^2(\Omega_j)$, we can show that the residual v_j has at least C^2 smoothness across the block boundary when it is extended by the even reflection. Therefore, if we use the Fourier *cosine series expansion* of v_j , we get the coefficients with decay rate $O(\|k\|^{-4})$. See also Theorem A.2 in Appendix A.

We naturally call this version of the transform the *polyharmonic local cosine transform* (PHLCT). However, this method of course requires to estimate the first order normal derivative of data at the boundary. We are currently investigating this issue with our collaborator, Katsu Yamatani, and getting encouraging results [44].

[44] K. Yamatani, N. Saito, Improvement of DCT-based compression algorithms using Poisson's equation, Technical report, Department of Mathematics, University of California, Davis, 2005, in preparation.

Id., 27, n.44 (annotated).

D. Takenaka

Takenaka “relates to a differential coding apparatus adaptable for the differential coding of a fast video signal such as a TV signal.” Ex. 1023, 1:8-10.

Takenaka discloses a switch that chooses between “predictive function computing circuits” but, as described below, each predictive function computing circuit corresponds to an intraframe previous value prediction, interframe prediction, and interframe background prediction, respectively:

The predictive function computing circuit 4 carries out the intraframe previous value prediction in which, as shown in FIG. 2, a pixel $X(i)$ to be coded is predicted on the basis of a reference pixel $X(i-1)$ just prior to the pixel $X(i)$ on

the same horizontal scanning line. This prediction is normally a linear prediction in which the predicted value $X(i)$ is obtained by multiplying the reference pixel $X(i-1)$ by a prediction coefficient, and the predictive function computing circuit 4 outputs the predicted value X_I of the intraframe previous value.

The predictive function computing circuit 5 carries out the interframe prediction for the movement compensation to output the predicted value X_M of the movement compensation. The predictive function computing circuit 6 carries out the interframe background prediction to output the background predicted value X_B .

Id., 2:52-68. In other words, **only one** of the predictive function computing circuits (predictive function computing circuit 5) carries out movement or motion compensation.

IV. CLAIM CONSTRUCTION

Petitioner’s assertion that it is “unnecessary to formally construe any claim term for purposes of institution” in this proceeding (Pet. at 7) contradicts its positions in *Advanced Coding Techs. LLC v. Google LLC*, Case No. 2:24-cv-00353-JRG (E.D. Tex.) (the “District Court Litigation”). In the District Court Litigation, both parties agreed to the following constructions:

Claim Term	Claims	Proposed Construction
“border motion-vector data” / “border motion vector data”	’025 Patent Claims 1, 3, 4, 6-10	“data representing the difference in spatial position between a border of the block to be predicted in the picture to be coded and the best-matched border in the

Claim Term	Claims	Proposed Construction
		reference picture.”
“boundary condition”	’025 Patent Claims 1, 3, 4, 6-10	“gradient data pertaining to the pixels at the boundary of a block”
“the input signal being obtained by multiplexing a coded bitstream obtained by predictive coding, border motion-vector data and post-quantization data obtained by quantization in the predictive coding”	’025 Patent Claims 6-8, 10	“the input signal being obtained by multiplexing a coded bitstream, obtained by predictive coding, comprising (1) border motion-vector data and (2) post-quantization data obtained by quantization in the predictive coding”

Ex. 2004, at 1-2. The Petition does not assume that the plain and ordinary meaning of these terms is as limited as the parties’ agreed-upon constructions, and the Petition’s analysis of the claim limitations containing these terms against the cited references does not indicate that those references disclose at least “border motion-vector data” or “boundary condition” under Petitioner’s proposed constructions in the District Court Litigation.

If Petitioner believed that any claim terms required construction, it had a duty to identify “how the challenged claim is to be construed” in its Petition. 37 C.F.R. § 42.104(3); *see also* Patent Trial and Appeal Board Consolidated Trial Practice Guide, November 2019, at 48 (“The Board, in its claim construction determinations, will consider statements regarding claim construction made by patent owners and by a petitioner filed in other proceedings, if the statements are timely made of record.”)

(citations omitted). Instead, Petitioner chose to apply the plain and ordinary meaning in this proceeding while agreeing to narrower constructions in the District Court Litigation. Therefore, the parties' agreed-upon constructions in the District Court Litigation should be applied in this proceeding. Notably, Petitioner was aware of these agreed-upon constructions from a previous district court litigation. *See* Dkts. 87, 155, *Advanced Coding Techs. LLC v. LG Elecs Inc.*, 2:22-cv-00501-JRG (E.D. Tex.) (Lead Case); *Advanced Coding Techs. LLC v. Samsung Elecs. Co.*, 2:22-cv-00499-JRG (E.D. Tex) (Member Case).

For the purposes of this Preliminary Response, Patent Owner notes that since both Patent Owner and Petitioner agreed to the constructions of the above terms in the District Court Litigation, it is highly likely that the District Court will enter the agreed construction. Patent Trial and Appeal Board Consolidated Trial Practice Guide, at 47 (citations omitted) ("Parties should submit a prior claim construction determination by a federal court or the ITC in an AIA proceeding as soon as that determination becomes available. Preferably, the prior claim construction determination should be submitted with the petition, preliminary response, or response, along with explanations. Submission of a prior claim construction determination is mandatory under 37 C.F.R. § 42.51(b), if it is 'relevant information that is inconsistent with a position advanced by the party during the proceeding.'").

V. LEVEL OF ORDINARY SKILL IN THE ART

For the purposes of this Preliminary Response only, Patent Owner utilizes Petitioner’s proposed level of skill in the art: “at least a bachelor’s degree in computer science, electrical engineering, computer engineering, or a related field, with at least two years of experience in digital video processing, or a related field. Additional graduate education could substitute for professional experience, and *vice versa.*” Pet. at 3 (citations omitted).

VI. THE BOARD SHOULD DISCRETIONARILY DENY THE PETITION FOR FAILURE TO ADDRESS THE ’025 PATENT IN ITS CORRECTED FORM PURSUANT TO 35 U.S.C. § 255

Petitioner improperly failed to file the ’025 Patent as an exhibit with its associated Certificate of Correction, dated October 4, 2022. Ex. 2005, at 42; 35 U.S.C. § 255 (“[T]he Director may, upon payment of the required fee, issue a certificate of correction, if the correction does not involve such changes in the patent as would constitute new matter or would require re-examination. *Such patent, together with the certificate, shall have the same effect and operation in law on the trial of actions for causes thereafter arising as if the same had been originally issued in such corrected form.*”) (emphasis added).

35 U.S.C. § 255’s “trial of actions for causes thereafter arising” means that a certificate of correction applies in an AIA trial, like this proceeding, when the certificate of correction issues before the filing of a petition. The IPR statutory

cause—which the PTAB can hear under the public-rights doctrine¹—arises upon the earlier of the filing of a petition or the Patent Owner serving the Petitioner, Petitioner’s real-party-in-interest, or Petitioner’s privy with a complaint alleging infringement. Because the pertinent “cause” (both in the related District Court Litigation and in the PTAB) arose after the ’025 Patent’s Certificate of Correction issued, the certificate has the “same effect and operation in law” as if the ’025 Patent were always corrected. As such, the Petition is facially deficient with respect to at least Claims 3, 8, and 10, whose claim terms were corrected by the Certificate of Correction and are not being afforded “the same effect and operation in law” as is requisite. Ex. 2005, at 42. Being afforded the “same effect and operation and law” has a common-sense policy objective of ensuring the same version of a patent (and its claims) apply in parallel proceedings in district courts and at the PTAB, which is being circumvented by the Petitioner here.

Therefore, the Petition should be denied in the Board’s discretion in view of Petitioner’s failure to address the ’025 Patent in its corrected form pursuant to 35

¹ *Oil States Energy Servs., LLC v. Greene’s Energy Grp., LLC*, 138 S. Ct. 1365, 1373 (2018) clarifying that an *inter partes* review “falls squarely within the public-rights doctrine” because it involves the “reconsideration of the Government’s decision to grant a public franchise”).

U.S.C. § 255.

VII. THE PETITION SHOULD BE DENIED IN THE BOARD'S DISCRETION IN VIEW OF SUBSTANTIALLY THE SAME PRIOR ART AND THE SAME ARGUMENTS PREVIOUSLY PRESENTED TO THE OFFICE DURING PROSECUTION

“In determining whether to institute or order a proceeding under this chapter, chapter 30, or chapter 31, the Director may take into account whether, and reject the petition or request because, *the same or substantially the same prior art or arguments previously were presented to the Office.*” 35 U.S.C. § 325(d) (emphasis added); *Unified Pats. Inc. v. John L. Berman*, IPR2016-01571, Paper 10 (P.T.A.B. Dec. 14, 2016) (denying institution where the prior art cited in the petition was used in combination by the PTO in attempting to reject the underlying application); *Funai Elec. Co. v. Gold Charm Ltd.*, IPR2015-01491, Paper 18 (P.T.A.B. Feb. 18, 2016) (denying institution because the same prior art asserted in the petition was considered by the Examiner during prosecution against those claims); *Neil Ziegman, N.P.Z., Inc. v. Carlis G. Stephens*, IPR2015-01860, Paper 11 (P.T.A.B. Feb. 24, 2016) (exercising its discretion under § 325(d) to deny institution on the basis that the petition presented substantially the same or similar art or arguments as those previously presented during prosecution of the patent).

Petitioner's Grounds 1A, 1B, and 2 are based on combinations involving substantially the same prior art as Saito (Ex. 1007) and similar arguments, which

were previously considered by the Office during prosecution of the '025 Patent. As a result, all of Petitioner's Grounds ought to be denied in the discretion of the Board.

In particular, during prosecution of the '025 Patent, the Examiner considered and cited to Non-patent document "Improvement of DCT-based Compression Algorithms Using Poisson's Equation," Katsu Yamatani and Naoki Saito, Senior Member, IEEE, pp. 1-36, September 12, 2005 ("Ex. 2006" or "Saito-2005") as shown below:

Receipt date: 09/13/2007
 Form PTO-1449 U.S. DEPARTMENT OF COMMERCE
 (Rev. 8-83) PATENT AND TRADEMARK OFFICE

Sheet 1 of 1
 APPLICATION NO. 11/787,623 - GAU: 2431
 DOCKET NO. KYO.P0066

INFORMATION DISCLOSURE CITATION
 (Attach several sheets if necessary)

FILING DATE
 April 17, 2007

FIRST NAMED APPLICANT
 Satoru Sakazume

ART UNIT

U.S. PATENT DOCUMENTS

*EXAMINER Initial	Document Number	Date	Name	Class	Subclass

FOREIGN PATENT DOCUMENTS

	Document Number	Date	Country	Class	Subclass
	1 WO 03/003749	1/9/2003	PCT	7	32

OTHER DOCUMENTS (Including Author, Title, Date, Pertinent Pages, Etc.)

2	Non-patent document "Improvement of DCT-based Compression Algorithms Using Poisson's Equation," Katsu Yamatani and Naoki Saito, Senior Member, IEEE, pp.1-36, September 12, 2005				

EXAMINER /Syed Zia/ DATE CONSIDERED 09/10/2011

*EXAMINER: Initial if citation considered, whether or not citation is in conformance with MPEP 609; Draw line through citation if not in conformance and not considered. Include copy of this form with next communication to applicant.

ALL REFERENCES CONSIDERED EXCEPT WHERE LINED THROUGH. /S.Z./

Ex. 1002, 57 (annotated). Examiner's "Reasons for Allowance" noted that it carefully examined Saito-2005 and found that it, along with other references, was sufficiently distinguished from several claim limitations of the '025 Patent:

Thus, the cited prior art does not explicitly teach or suggest a moving-picture coding apparatus comprising:

a predictive encoder to produce and encode a residual picture that is a residual signal between a picture to be coded that is an input moving-picture video signal to be

subjected to coding and a predictive picture produced from a reference picture that is a local decoded video signal for each of a plurality of rectangular zones, each composed of a specific number of pixels, into which a video area of the moving-picture video signal is divided;

a zone-border motion estimator to obtain a boundary condition of each of a plurality of borders between the rectangular zones and another plurality of rectangular zones adjacent to the rectangular zones, find a border, of the reference picture, having a boundary condition that matches the boundary condition, by motion-vector search in the reference picture, and generate border motion-vector data that is data on a motion vector from a border of the rectangular zone in the picture to be coded to the border of the reference picture thus found; and

a zone-border motion compensator to define a boundary condition of a border that corresponds to the border motion vector data, from the reference picture based on the border motion-vector data, and ***generate an estimated video signal in each rectangular zone in the picture to be coded, that satisfies Poisson's Equation, thus producing a first predictive picture,***

...

The examiner has found that the prior art of record does not appear to teach or suggest or render obvious the claimed limitations in combination with the specific added limitations as recited in independent claims and subsequent dependent claims. The prior art of record fails to teach or suggest a system and method as mentioned above.

An updated search did not reveal any prior art that would anticipate or make obvious the currently claimed invention.

Ex. 1002, 49-51 (emphasis added).

Notably, Petitioner’s reliance on Saito (Ex. 1007) in this proceeding stems from Saito’s precise citation to Saito-2005 on page 27, Footnote 44, reproduced below:

6.2.2. *Use of the Neumann boundary condition*

It is possible to use the *Neumann boundary condition* instead of the Dirichlet condition in (3). This will give us the $O(\|k\|^{-4})$ decay rate of the v_j components instead of $O(\|k\|^{-3})$ in the case of the Dirichlet boundary condition. To do so, we need to modify (3); we shall solve the following *Poisson equation* with the Neumann boundary condition:

$$\begin{cases} \Delta u_j = K_j & \text{in } \Omega_j, \\ \frac{\partial u_j}{\partial \nu} = \frac{\partial f_j}{\partial \nu} & \text{on } \partial\Omega_j, \end{cases} \quad (13)$$

where K_j is a constant that needs to be computed as follows:

$$K_j = \frac{1}{|\Omega_j|} \int_{\partial\Omega_j} \frac{\partial f_j}{\partial \nu} \, ds,$$

which is the boundary integral of $\partial f_j / \partial \nu$ normalized by $|\Omega_j|$ (the volume of the domain). This constant K_j is necessary for (13) to have a unique solution (modulo an additive constant); see, e.g., [43, p. 84]. The solution u_j is not just a function having the same normal derivative at the boundary with the original function f_j ; one can show that it is *the minimizer of the total squared curvature integral* on the domain Ω_j . Once we get the solution u_j , the residual function $v_j = f_j - u_j$ clearly satisfies $\partial v_j / \partial \nu = 0$ on $\partial\Omega_j$. Assuming that $f_j \in C^2(\bar{\Omega}_j)$, we can show that the residual v_j has at least C^2 smoothness across the block boundary when it is extended by the even reflection. Therefore, if we use the Fourier *cosine* series expansion of v_j , we get the coefficients with decay rate $O(\|k\|^{-4})$. See also Theorem A.2 in Appendix A.

We naturally call this version of the transform the *polyharmonic local cosine transform* (PHLCT). However, this method of course requires to estimate the first order normal derivative of data at the boundary. We are currently investigating this issue with our collaborator, Katsu Yamatani, and getting encouraging results [44].

[44] K. Yamatani, N. Saito, Improvement of DCT-based compression algorithms using Poisson’s equation, Technical report, Department of Mathematics, University of California, Davis, 2005, in preparation.

Ex. Saito, 27, n.44 (annotated). See Pet. at 69-71 (“using Saito’s technique for solving Poisson’s equation with known boundary conditions”; “Saito’s image approximation techniques based on solving Poisson’s equation would have . . . achieve[d] similar goals of image approximation”; “Saito’s Polyharmonic Local Cosine Transform (PHLCT) is an enhancement of a Polyharmonic Local Sine Transform (PHLST) technique for image approximation”; “[t]he PHLCT variation

of PHLST approximates an image between two boundaries by ‘solv[ing] the . . . Poisson equation with the Neumann boundary condition’; ‘PHLCT would have been capable of approximating the image between these boundary conditions’; ‘Saito’s techniques represent a natural improvement of image approximation techniques, at least because they can achieve a faster ‘decay rate’ for the error signal at the boundaries of blocks’) (citing Ex. 1007, 27).

Petitioner even admits that ‘Saito’s process of PHLCT is described by the ’025 patent itself, and the ’025 patent cites a subsequent publication by Dr. Naoki Saito that explains the PHLCT method.’ Pet. at 71. Such an admission indicates that the relevant portion of Saito’s disclosure of the PHLCT is substantially similar to the disclosure of Saito-2005 (i.e., what Petitioner calls ‘a subsequent publication by Dr. Naoki Saito that explains the PHLCT method,’ which was considered by the Patent Office during prosecution without a doubt.

The Board should find that the Examiner’s consideration of Saito-2005 precludes the Petition from being granted institution since Saito is substantially the same art as Saito-2005 and being presented for substantially the same argument with respect to Petitioner’s reliance on Saito cites to the recited ‘generat[ing] an estimated video signal in each rectangular zone in the picture to be coded, that satisfies Poisson’s Equation, thus producing a first predictive picture.’

**VIII. PETITIONER HAS NOT DEMONSTRATED A REASONABLE
LIKELIHOOD OF SUCCESS FOR THE GROUNDS
ADVANCED IN THE PETITION, AND THE PETITION
SHOULD BE DENIED**

The question of obviousness is resolved on the basis of underlying factual determinations, including: (1) the scope and content of the prior art, (2) any differences between the claimed subject matter and the prior art, (3) the level of skill in the art, and (4) so-called secondary considerations where in evidence. *Graham v. John Deere Co. of Kansas City*, 383 U.S. 1, 17-18 (1966); *KSR Int'l Co. v. Teleflex Inc.*, 550 U.S. 398, 406 (2007). The question is not whether the differences themselves would have been obvious, but whether the claimed invention as a whole would have been obvious. *Stratoflex, Inc. v. Aeroquip Corp.*, 713 F.2d 1530, 1537 (Fed. Cir. 1983).

The Board has held that a failure to identify the differences between the claimed subject matter and the prior art is fatal to an obviousness challenge. *See, Apple, Inc. v. Contentguard Holdings, Inc.*, IPR2015-00355, Decision Denying Institution of *Inter Partes* Review, Paper 9 at 9-10 (P.T.A.B. June 26, 2015) (denying institution for failure to identify the differences between the claimed subject matter and the prior art).

In arriving at an obviousness determination, the Board must sufficiently explain and support the conclusions that the prior art references disclose all the

elements recited in the Challenged Claims and a relevant, skilled artisan not only could have made, but would have been motivated to combine all the prior art references in the way the patent claims and reasonably expected success. *Pers. Web Techs., LLC v. Apple, Inc.*, 848 F.3d 987, 994 (Fed. Cir. 2017). That is, even if all the claim elements are found across a number of references, an obviousness determination must consider whether a person of ordinary skill in the art would have the motivation to combine those references. *Intelligent Bio-Sys., Inc. v. Illumina Cambridge Ltd.*, 821 F.3d 1359, 1368 (Fed. Cir. 2016); *Los Angeles Biomedical Rsch. Inst. at Harbor-UCLA Med. Ctr. v. Eli Lilly & Co.*, 849 F.3d 1049, 1067 (Fed. Cir. 2017) (vacating and remanding an obviousness determination, in part, because the Board did not make factual finding as to whether there was an apparent reason to combine all three prior art references to achieve the claimed invention and whether a person of skill in the art would have had a reasonable expectation of success from such a combination). This combinability determination, as supported by an articulated motivation to combine, requires a plausible rationale as to why those prior art references would have worked together. *Broadcom Corp. v. Emulex Corp.*, 732 F.3d 1325, 1335 (Fed. Cir. 2013). Absent some articulated rationale, a “common sense” finding is no different than the conclusory statement “would have been obvious.” *In re Van Os*, 844 F.3d 1359, 1361 (Fed. Cir. 2017). Of additional importance, “knowledge of a problem and motivation to solve it are entirely different

from motivation to combine particular references” *Innogenetics, N.V. v. Abbott Lab’ys.*, 512 F.3d 1363, 1373 (Fed. Cir. 2008).

A. Claim 6 Is Not Obvious Over Any Combination of Mualla, Shirani, Saito, and Takenaka

1. The Petition Does Not Show that Any Combination of Mualla, Shirani, Saito, and Takenaka Discloses “border motion-vector data,” as Required by Claim Elements [6.2] and [6.8]

Claim 6 of the ’025 Patent requires “border motion-vector data.”

As noted above, Petitioner failed to propose a construction for this term, despite agreeing to construe this term as “data representing the difference in spatial position between a border of the block to be predicted in the picture to be coded and the best-matched border in the reference picture” in the District Court Litigation. *See supra* Section IV.

Instead, Petitioner merely proposes that the “border motion-vector data” term is met by Shirani’s disclosure of “motion vectors of neighboring blocks.” Pet. at 56 (citing Ex. 1006, 2-3). However, Shirani is silent regarding whether the motion vectors of available neighboring blocks are at a border, let alone determining a “best-matched border in the reference picture.” Petitioner also states, without any quotes to Shirani that “[t]hese motion vectors of neighboring blocks are used to obtain an estimate of pixels *at each border* of the missing block.” Pet. at 56 (emphasis added). Even if Shirani disclosed this (it does not), estimates of pixels at the borders of a

missing block are not border motion-vector data because there is no indication that Shirani's estimated pixels are on a border and estimates of pixels are not motion-vector data or "data representing the difference in spatial position between a border of the block to be predicted in the picture to be coded and the best-matched border in the reference picture."

As the Petition implicitly admits, the only mention of "borders" in Shirani relates to trying "[t]o obtain an initial estimate of [a] missing block that smoothly connects to the rest of the image" by selecting a block that "minimizes the squared sums of border errors." *See* Ex. 1006, 3 ("To obtain an initial estimate of the missing block that smoothly connects to the rest of the image, a block from the above four blocks that minimizes the squared sums of border errors, between the estimated block and its adjacent above and left blocks, is selected.").

First, determining whether the squared sums of border errors are minimized contradicts the meaning of border motion-vector data, as the claim requires, because it bases its choice of estimated block based on multiple border data instead of calculating "data representing the differences . . . between a border of the block to be predicted . . . and the best-matched border in the reference picture." In other words, the proper construction of "border motion-vector data" requires a more granular and accurate border-by-border differential data. This disclosure in Shirani is the same prior art system described in the '025 Patent, where, similarly, "an

optimum block is selected in motion estimation.” ’025 Patent, 2:11-26. The ’025 Patent describes that this prior art system has the disadvantage that there “may be several blocks having the same quality as that block,” (i.e., the same quality of minimizing the “squared sums of border errors”):

Smoothing is followed by orthogonal transform, quantization and entropy coding to a residual video frame produced by subtraction between a reference picture and a moving-picture frame to be coded. Smoothing is applied to a predictive picture produced by motion compensation after an optimum block is selected in motion estimation, thus such a block may not always be optimum after this procedure. There may be several blocks having the same quality as that block in the predictive picture after smoothing. Thus, it requires a larger amount of computation for obtaining more appropriate motion-vector data under consideration of the code amount of motion-vector data and orthogonal-transform coefficients data after quantization, because of repeated operations of motion estimation, motion compensation and smoothing procedures for obtaining optimum motion-vector data.

Id. Therefore, the ’025 Patent explains that prior art systems like Shirani are not ideal because “it requires a larger amount of computation” to “obtain[] optimum motion-vector data.”

Elsewhere in its disclosure, Shirani explicitly teaches away from “edge-based methods” as being “computationally more intensive”:

In [4], each pixel in a damaged block is interpolated from the corresponding pixels in its four neighboring blocks such that the total squared border error is minimized. In [5] and [6], the missing information is interpolated

utilizing spatially correlated edge information from a large local neighborhood. Note that *although these edge-based methods are generally more accurate than other approaches, they are computationally more intensive. In [7], a computationally simple, spatial directional interpolation scheme has been proposed.*

Ex. 1006, 1 (emphasis added). Shirani’s teaching away from edge-based (*i.e.*, border-based) methods indicates that the ’025 Patent’s border motion-vector data that focused on a more accurate border-by-border analysis, as described above, was novel since it resulted in *less* computation instead of more.

Because of this deficiency, institution should be denied.

2. **The Petition Does Not Show that Any Combination of Mualla, Shirani, Saito, and Takenaka Discloses “obtaining a boundary condition of each of a plurality of borders between the rectangular zones and another plurality of rectangular zones adjacent to the rectangular zones, finding a border, of the reference picture, having a boundary condition that matches the boundary condition, by motion-vector search in the reference picture, and generating the border motion-vector data that is data on a motion vector from a border of the rectangular zone in the picture to be coded to the border of the reference picture thus found, defining a boundary condition of a border that corresponds to the border motion vector data, from the reference picture based on the border motion vector data” and “zone-border motion compensator to define a boundary condition of a border that corresponds to the border motion vector data, from the reference picture based on the border motion-vector data,” as Required by Claim Elements [6.4]-[6.6] and [6.11]**

Claim 6 of the ’025 Patent requires “obtaining a boundary condition of each

of a plurality of borders between the rectangular zones and another plurality of rectangular zones adjacent to the rectangular zones, finding a border, of the reference picture, having a boundary condition that matches the boundary condition, by motion-vector search in the reference picture, and generating the border motion-vector data that is data on a motion vector from a border of the rectangular zone in the picture to be coded to the border of the reference picture thus found, defining a boundary condition of a border that corresponds to the border motion vector data, from the reference picture based on the border motion vector data.”

First, the Petition is deficient because the combination of Mualla, Shirani, Saito, and Takenaka does not disclose the claimed “boundary condition.” The claim language is clear that “border motion-vector data . . . defin[es] a boundary condition of a border that corresponds to the border motion vector data” and “a boundary condition of a border [] corresponds to the border motion vector data.” ’025 Patent, Claim 6. Therefore, if the combination of Mualla, Shirani, Saito, and Takenaka does not disclose “border motion-vector data,” it cannot also disclose the required “boundary condition.” As noted in Section VIII.A.1 above, the Petition does not show that the combination of Mualla, Shirani, Saito, and Takenaka discloses “border motion-vector data.” Therefore, the Petition also cannot show that the combination discloses “obtaining a *boundary condition* of each of a plurality of borders between the rectangular zones and another plurality of rectangular zones adjacent to the

rectangular zones, finding a border, of the reference picture, having a *boundary condition that matches the boundary condition*, by motion-vector search in the reference picture, and *generating the border motion-vector data that is data on a motion vector from a border of the rectangular zone in the picture to be coded to the border of the reference picture thus found, defining a boundary condition of a border that corresponds to the border motion vector data, from the reference picture based on the border motion vector data.*”

Second, as noted above, Petitioner failed to propose a construction for “boundary condition,” despite agreeing to construe this term as “gradient data pertaining to the pixels at the boundary of a block” in the District Court Litigation. *See supra* Section IV. The Petition fails to even mention “gradient data” in its discussion of Claims [6.4]-[6.6] and [6.11]. *See* Pet. at 63-69, 78-81. Instead, the Petition’s only mention of gradients is with respect to the ’025 Patent (Pet. at 3-6) with one exception citing to Dr. Reader, Petitioner’s expert, that “Shirani’s ‘border error’ is equivalent to Saito’s ‘derivative at the boundary’ (which is equivalent to the ’025 patent’s “gradient” value at a boundary).” Pet. at 39 (citing Ex. 1003, ¶ 197). However, the cited paragraph of Petitioner’s expert declaration is merely a duplicate statement that also contains no citation for the proposition that a derivative at a boundary is a gradient:

Shirani's "border error" is equivalent to Saito's "derivative at the boundary" (which is equivalent to the '025 patent's "gradient" value at a boundary) because both Shirani's "border error" and Saito's "derivative at the boundary" are equal to a difference of adjacent pixel values across a border/boundary between two blocks.

Ex. 1003, ¶ 197. With nothing other than Petitioner's expert's unsubstantiated statement, the Petition is facially deficient for failing to meet the construction the parties agreed upon in the District Court Litigation.

Because of this deficiency, institution should be denied.

- 3. The Petition Does Not Show that Any Combination of Mualla, Shirani, Saito, and Takenaka Discloses “a motion compensator to specify a corresponding rectangular zone in the reference picture based on the motion vector data, thus generating a second predictive picture,” as Required by Claim Element [6.14] or “a selector to select either the first predictive picture or the second predictive picture and supply the predictive picture thus selected to the combiner,” as Required by Claim Element [6.15]**

Claim 6 of the '025 Patent requires “a motion compensator to specify a corresponding rectangular zone in the reference picture based on the motion vector data, thus generating a second predictive picture” and “a selector to select either the first predictive picture or the second predictive picture and supply the predictive picture thus selected to the combiner.”

The Petition is deficient because Petitioner fails to explain how the system of Mualla supports “a second predictive picture.” While it is true that Mualla describes

a “typical video codec” (Pet. at 85-86 (citing to Ex. 1005, Fig. 1.1)), it does not show utilizing two different motion compensation models in the same system (i.e., both the recited “zone-border motion compensator” of Claim [6.11] and “motion compensator” of Claim [6.14]). To the extent that Mualla discloses different types of motion compensation (e.g., “motion-compensated error concealment”), it does so as possible adaptations to the “typical video codec,” not as an integration with such a codec. *See* Ex. 1005, 27 (“Careful examination of this [typical] codec (as will be detailed in subsequent chapters) reveals that a *motion-based approach* can be adopted to provide suitable solutions for the three challenges of higher coding efficiency, reduced complexity, and error resilience.”). The Petition does not disclose a reference with two different motion compensation models in the same system or demonstrate a motivation to combine references to create a system with two different motion compensation models. Therefore, the Petition cannot disclose “a second predictive picture.”

Similarly, because the Petition does not show that any combination of Mualla, Shirani, Saito, and Takenaka discloses “a motion compensator to specify a corresponding rectangular zone in the reference picture based on the motion vector data, thus generating *a second predictive picture*,” the Petition also cannot show that the combination discloses “a selector to select either the first predictive picture or *the second predictive picture* and supply the predictive picture thus selected to the

combiner.”

The Petition is also deficient because Petitioner fails to show how any of the cited references disclose “a selector to select either the first predictive picture or the second predictive picture.” Instead, Petitioner relies on vague citations to various references and illogical leaps to reach this claim limitation. Each of these citations is taken in turn below.

First, Petitioner argues that “a POSITA would have recognized and found obvious that traditional motion compensation [] would execute until an error was detected by the decoder in the bitstream, at which point the error concealment techniques of the Mualla-Shirani-Saito [] combination would be used to generate replacement motion vector and video data.” Pet. at 87-88 (citing Ex. 1005, 265).

Petitioner’s expert is cited for this proposition as well but Petitioner’s expert only recites the same sentence as the Petition with no further detail as to how a POSITA would have used the cited portion of Mualla to infer switching from traditional motion compensation to the error concealment technique of Mualla. *See* Ex. 1003, ¶ 263.

Moreover, the cited portion of Mualla only mentions that “[w]hen an error is detected, the decoding process is stopped, the decoder searches for the next synchronization codeword, and decoding is resumed. All macroblocks between the point where the error was detected and the synchronization point are marked as

damaged macroblocks.” Ex. 1005, 265. There is no implication about switching from traditional motion compensation to error concealment motion compensation, let alone the required selecting between two predictive pictures that are output from each of the two motion compensation systems. As noted above, none of the references disclose the possibility of multiple motion compensation systems working simultaneously.

Second, Petitioner cites to a portion of Girod (Ex. 1008) for also showing that off-the-shelf video decoders would not be adequate for error-free transmission. Pet. at 88. But Girod is not one of the cited references in Petitioner’s Grounds and should be disregarded. Nevertheless, even if Girod were considered, the cited portion of Girod does not describe utilizing two motion compensation systems or selecting between two predictive pictures that are output from each of the two motion compensation systems. Girod merely states that “[s]pecial provisions for error detection, resynchronization, and concealment are required” since “an erroneous bit stream cannot be gracefully decoded by an ‘off-the-shelf’ video decoder build [sic] for error-free transmission.” Ex. 1008, 4. Petitioner’s expert also does not describe what those “special provisions” might be or how this portion indicates any switch or selector. *See* Ex. 1003, ¶ 203.

Third, Petitioner points to Takenaka to allegedly show a “selector” to “switch between” “circuits for traditional motion compensation and error concealment.” Pet.

at 88 (citing Ex.1023, 2:52-3:26, 7:67-8:38, Figs. 1, 10). But the switch shown in FIG. 1 of Takenaka is described as choosing between “predictive function computing circuits.” However, as described below, each predictive function computing circuit corresponds to an intraframe previous value prediction, interframe prediction, and interframe background prediction, respectively:

The predictive function computing circuit 4 carries out the intraframe previous value prediction in which, as shown in FIG. 2, a pixel $X(i)$ to be coded is predicted on the basis of a reference pixel $X(i-1)$ just prior to the pixel $X(i)$ on the same horizontal scanning line. This prediction is normally a linear prediction in which the predicted value $X(i)$ is obtained by multiplying the reference pixel $X(i-1)$ by a prediction coefficient, and the predictive function computing circuit 4 outputs the predicted value X_I of the intraframe previous value.

The predictive function computing circuit 5 carries out the interframe prediction for the movement compensation to output the predicted value X_M of the movement compensation. The predictive function computing circuit 6 carries out the interframe background prediction to output the background predicted value X_B .

Ex. 1023, 2:52-68. In other words, **only one** of the predictive function computing circuits (predictive function computing circuit 5) carries out movement or motion compensation. Claim 6.14 and 6.15 require a “second predictive picture” that would be the result of a second type of motion compensation. Therefore, Takenaka fails to disclose a selector that would be relevant to the purported Mualla-Shirani-Saito combination.

Fourth, Petitioner goes back to Mualla to allegedly show a “selector” to control inter or intra coding with no citation and no further explanation as to why a selector to control inter or intra coding would be relevant to choosing between two predictive pictures generated with different motion compensation techniques. Pet. at 89. Petitioner then cites to its expert for the proposition that “using a selector to switch between normal decoding and error concealment ‘would have been a natural extension of techniques disclosed within Mualla.’” *Id.* (citing Ex. 1003, ¶ 266. However, the sole citation to Petitioner’s expert declaration itself has the very same remark without any citation, as shown below:

266. Moreover, Mualla uses a “*selector*” to control inter or intra coding. Ex.1005, 72, FIG. 3.1. Using a selector to switch between normal decoding and error concealment would have been a natural extension of techniques disclosed within Mualla.

Ex. 1003, ¶ 266. It is thus unclear how a POSITA would have found switching between normal decoding and error concealment to be “a natural extension of techniques disclosed within Mualla.”

Because of these deficiencies, institution should be denied.

4. The Petition Does Not Show that Any Combination of Mualla, Shirani, Saito, and Takenaka Discloses “*a decoding controller to receive decoding control data for decoding control from the parameter data and control the selector to switch the predictive picture to be supplied to the combiner between the first and second predictive pictures according to the decoding control data,*” as Required by Claim Elements [6.16]

Claim 6 of the '025 Patent requires “a decoding controller to receive decoding control data for decoding control from the parameter data and control the selector to switch the predictive picture to be supplied to the combiner between the first and second predictive pictures according to the decoding control data.”

As noted in Section VIII.A.3 above, the Petition does not show that the combination of Mualla, Shirani, Saito, and Takenaka discloses “*a selector to select either the first predictive picture or the second predictive picture* and supply the predictive picture thus selected to the combiner.” Therefore, the Petition also cannot show that the combination discloses “a decoding controller to receive decoding control data for decoding control from the parameter data and *control the selector to switch the predictive picture to be supplied* to the combiner between the first and second predictive pictures according to the decoding control data.”

Because of this deficiency, institution should be denied.

B. Claims 1-5 and 7-10 Are Not Obvious Over Any Combination of Mualla, Shirani, Saito, and Takenaka

The Petition relies on its arguments for Claim 6 to render obvious Claims 1-5 and 7-10. Pet. at 95-96, 103. Therefore, for at least the same reasons as described for Claim 6, the Petition fails to show how Claims 1-5 and 7-10 are rendered obvious over any combination of Mualla, Shirani, Saito, and Takenaka.

IX. CONCLUSION

For the foregoing reasons, Patent Owner respectfully requests that the Board deny institution of the Petition in its entirety.

Respectfully submitted,

Dated: September 12, 2025 By: /Peter Lambrianakos /
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CERTIFICATE 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 has 7976 words in compliance with the 14,000 word limit set forth in 37 C.F.R. § 42.24. This word count was prepared using Microsoft Word for Office 365.

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CERTIFICATE OF SERVICE

A copy of the foregoing Patent Owner's Preliminary Response and Exhibits
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