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Paper 9
Dated: March 7, 2025

UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE PATENT TRIAL AND APPEAL BOARD

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

v.

NOKIA TECHNOLOGIES OY,
Patent Owner.

IPR2024-01176
Patent 8,175,148 B2

Before MICHAEL R. ZECHER, SCOTT B. HOWARD, and
JASON M. REPKO, *Administrative Patent Judges*.

REPKO, *Administrative Patent Judge*.

DECISION
Granting Institution of *Inter Partes* Review
35 U.S.C. § 314

I. INTRODUCTION

Amazon.com, Inc. and Amazon.com Services LLC (collectively, "Petitioner") filed a petition requesting *inter partes* review of claims 1–23 of U.S. Patent No. 8,175,148 B2 (Ex. 1001, "the '148 patent" or "the challenged patent"). Paper 3 ("Pet."). Nokia Technologies OY ("Patent Owner") filed a Preliminary Response. Paper 8 ("Prelim. Resp.").

To institute an *inter partes* review, we must determine "that there is a reasonable likelihood that the petitioner would prevail with respect to at least 1 of the claims challenged in the petition." 35 U.S.C. § 314(a). For the reasons discussed below, Petitioner has shown a reasonable likelihood that it would prevail with respect to all claims challenged in the Petition. Thus, we institute an *inter partes* review.

A. Related Matters

According to the parties, the '148 patent has been asserted in the following related matters:

- *Nokia Technologies Oy v. Amazon.com, Inc.*, No. 1-23-cv-01236 (D. Del. Oct. 31, 2023) ("the co-pending litigation");
- *Nokia Technologies Oy v. HP Inc.*, No. 1-23-cv-01237 (D. Del. Oct. 31, 2023);
- *Nokia Corporation et al. v. Amazon.com, Inc.*, No. 1:23-cv-01232 (D. Del. Oct. 27, 2023);
- *Nokia Technologies Oy v. Lenovo (Shanghai) Electronics Technology Co.*, No. 5:19-cv-00427 (E.D.N.C. Sept. 25, 2019);
- *Nokia Technologies Oy v. Apple Inc.*, No. 2:16-cv-01440 (E.D. Tex. Dec. 21, 2016);

- *In the Matter of Certain Electronic Devices, Including Computers, Tablet Computers, and Components and Modules Thereof*, Inv. No. 337-TA-1208 (ITC July 2, 2020); and
- *In the Matter of Certain Video Capable Electronic Devices, Including Computers, Streaming Devices, Televisions, and Components and Modules Thereof*, Inv. No. 337-TA-1380 (ITC Oct. 31, 2023).

Pet. 87; Paper 5, 2–3 (Mandatory Notices).

B. The '148 Patent

The '148 patent generally relates to specifying quantization parameters (QPs) for compressing a digital video sequence. Ex. 1001, code (57). Larger QPs produce greater compression at the expense of video quality. *Id.* at 4:57–60. Smaller QPs maintain image quality but produce less compression. *Id.* at 4:60–62. So QPs can be adjusted to account for available bandwidth or the video quality desired. *Id.* at 4:33–62.

QPs can be indicated at the slice or macroblock layer. *Id.* at 10:33–43, 57–62. A slice is part of an image and may be coded independently from other slices. *Id.* at 10:37–41. According to the '148 patent, indicating the QP at the slice or other lower levels can be expensive if the frames are divided into many slices. *Id.* at 10:62–67.

The '148 patent's method uses a sequence-dependent reference QP for multiple pictures in a sequence. *Id.* at 11:25–36. The default quantization level to be used throughout the video sequence's encoding can be updated during the encoding. *Id.* at 12:19–24. Under this method, there is no need to transmit a full QP for every slice or picture. *Id.* at 11:32–36. Instead, a smaller value—the difference between the reference QP and the one actually used—can be transmitted and used to reconstruct the picture or slice QP. *Id.*

C. Claims

Of those challenged, claims 1, 12, and 23 are independent. Claim 1 is reproduced below.

> 1. A method of encoding a digital video sequence for use in a video coding application to produce an encoded video bit-stream representative of the digital video sequence, the digital video sequence comprising a number of frames, each frame of said sequence comprising an array of pixels divided into a plurality of blocks, each block comprising a certain number of said pixels, said method comprising:
>
> encoding a frame of the digital video sequence by applying motion compensated prediction to blocks of pixels for producing corresponding blocks of prediction error values;
>
> applying a transform coding technique to said blocks of prediction error values to produce sets of transform coefficient values representative of said blocks of prediction error values;
>
> defining a default level of quantization for use in encoding of the digital video sequence to quantize the sets of transform coefficient values; and
>
> providing an indication of the default level of quantization to a decoding process.

Ex. 1001, 25:41–60.

D. Evidence

Name	Reference	Exhibit No.
MPEG-1	ISO/IEC 11172-2 (1st ed.) Information technology - Coding of moving pictures and associated audio for digital storage media at up to about 1,5 Mbit/s - Part 2: Video (Aug. 1, 1993)	1005
H.263	ITU-T Recommendation H.263 (Feb. 1998)	1006

E. Asserted Grounds

Petitioner asserts that claims 1–23 are unpatentable on the following grounds. Pet. 2.

Claims Challenged	Pre-AIA[1] 35 U.S.C. §	Reference(s)/Basis
1–23	103(a)	MPEG-1
1–22	103(a)	H.263

II. ANALYSIS

A. Level of Ordinary Skill in the Art

According to the Petition,

> A person of ordinary skill in the art ("POSITA") at the time of the '148 Patent would have had a (1) Bachelor's degree in Electrical or Computer Engineering, Computer Science, or a comparable field of study such as Physics, and (2) approximately 2-3 years of practical experience with video and/or image processing or coding. More education could substitute for experience, and vice versa.

Pet. 5–6 (citing Ex. 1003 ¶¶ 23–24). Patent Owner applied Petitioner's definition in the Preliminary Response. Prelim. Resp. 16 (Pet. 5–6).

At this stage, we adopt Petitioner's uncontested assessment of the level of skill in the art because (1) it is consistent with the '148 patent and the asserted prior art and (2) it is supported by the testimony of Dr. Eli Saber.

If the parties believe that the level of skill in the art would affect the outcome in this case, the parties must brief that issue. The failure to describe how a different level of skill in the art is determinative will be a forfeiture of

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[1] Congress amended § 103 when it passed the Leahy-Smith America Invents Act (AIA). Pub. L. No. 112–29, § 3(c), 125 Stat. 284, 287 (2011). Here, Petitioner asserts that the previous version of § 103 applies. Pet. 1 n.2.

that argument. If there is a dispute regarding the level of ordinary skill in the art, then the parties are also encouraged to submit evidence, other than conclusory expert testimony, that supports their position.

B. Claim Construction

We are required to construe only those terms that are in controversy, and only to the extent necessary to resolve the controversy. *Realtime Data, LLC v. Iancu*, 912 F.3d 1368, 1375 (Fed. Cir. 2019) (citing *Vivid Techs., Inc. v. Am. Sci. & Eng'g, Inc.*, 200 F.3d 795, 803 (Fed. Cir. 1999)).

Petitioner proposes constructions for means-plus-function limitations in certain challenged claims. Pet. 6–9. Patent Owner does not challenge those constructions. Prelim. Resp. 16. Neither party argues that we need to construe any terms to determine whether to institute an *inter partes* review. *See* Pet. 6; Prelim. Resp. 16.

The Petition and Patent Owner's Preliminary Response, however, contain arguments that turn on the meaning of "defining a default level of quantization for use in encoding of the digital video sequence." Ex. 1001, 25:56–57; Pet. 51; Prelim. Resp. 24-26. We address this dispute in our analysis of the H.263 ground. *See* Section II.D.2 *infra*.

Apart from the terms that appear in the step of "defining a default level of quantization," no other terms are in controversy or need to be expressly construed at this time.

C. Obviousness over MPEG-1

Petitioner asserts that claims 1–23 are unpatentable as obvious over MPEG-1. Pet. 2, 9–44.

1. MPEG-1

MPEG-1 describes the MPEG-1 video-compression standard. Ex. 1005, 1.[2] MPEG-1 uses motion compensation. *Id.* at 13. Motion compensation reduces redundancy by transmitting a motion vector and the difference between a predicted block and the current block instead of the current block itself. *Id.* at 95. The difference between the current block and the predicted one is called the "prediction error." *Id.* at 13. MPEG-1 compresses the prediction error in two steps. *Id.* at 13–14. First, the discrete cosine transform (DCT) is applied to each block. *Id.* Second, the resulting DCT coefficients are quantized. *Id.* The quantization reduces the bits needed to encode DCT coefficients. *Id.* at 14.

2. Claim 1

a. Preamble

Claim 1's preamble recites, in part, "encoding a digital video sequence for use in a video coding application." Ex. 1001, 25:41–42. The rest of the preamble describes the encoded video bit stream that is produced, which includes frames, blocks, and pixels. *Id.* at 25:42–47.

At this stage, Patent Owner's arguments do not focus on the preamble. *See* Prelim. Resp.

Even if we treat the preamble as limiting, Petitioner has shown that MPEG-1 pictures comprise pixels that are divided into luminance and chrominance blocks. *See* Pet. 12–13 (citing Ex. 1005, 12, 14, 22, 25, 27, 32, 34, 68, 71). According to the Petition, MPEG-1's group of pictures (GOP)

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[2] All references to page numbers in MPEG-1 refer to the number inserted by Petitioner centered at the bottom of each page in Exhibit 1005.

corresponds to the recited sequence of frames with pixels, and the macroblocks correspond to the recited blocks with pixels. *Id.* We agree with Petitioner on this point because the cited parts of the MPEG-1 standard disclose a sequence of pictures (Ex. 1005, 27) that are coded as a GOP (*id.* at 32), each picture includes at least one macroblock (*id.* at 34), and each macroblock is divided into luminance and chrominance blocks (*id.*). Thus, Petitioner sufficiently shows that MPEG-1 teaches or suggests the preamble and its recited encoded video bit stream: "a number of frames, each frame of said sequence comprising an array of pixels divided into a plurality of blocks, each block comprising a certain number of said pixels." Pet. 12–13.

b. Motion Compensated Prediction

Claim 1 recites, in part, "encoding a frame of the digital video sequence by applying motion compensated prediction to blocks of pixels for producing corresponding blocks of prediction error values." Ex. 1001, 25:48–51.

According to the Petition, MPEG-1 applies motion compensated prediction. Pet. 14. We agree with Petitioner because (1) MPEG-1 processes P-pictures using motion-compensated prediction from a previous intra- or predictive-coded picture (Ex. 1005, 13), and (2) the encoder's motion-compensated prediction forms prediction errors for the macroblocks using motion vectors (*id.* at 24). Thus, Petitioner has shown that MPEG-1's encoder produces "corresponding blocks of prediction error values," as recited. Pet. 13–14.

At this stage, Patent Owner does not make any arguments that are specific to this limitation. *See* Prelim. Resp.

c. Transform Coding Technique

Claim 1 recites, in part, "applying a transform coding technique to said blocks of prediction error values to produce sets of transform coefficient values representative of said blocks of prediction error values." Ex. 1001, 25:52–55.

According to the Petition, MPEG-1's DCT is "a transform coding technique," the corresponding transformation of prediction-error signals corresponds to the recited "said blocks of prediction error values," and coefficients produced by transforming the difference of the motion compensated macroblock and the current macroblock correspond to the recited "sets of transform coefficient values." Pet. 14 (citing Ex. 1005, 13–15; Ex. 1004 ¶ 115). We agree with Petitioner because the DCT transforms the predictive-coded macroblocks, which represent the prediction-error values (Ex. 1005, 13–15), and MPEG-1 discloses that the DCT produces the transform coefficients (*id.* at 15). Thus, Petitioner has sufficiently shown that MPEG-1 applies the transform-coding technique recited in claim 1. Pet. 14–15 (citing Ex. 1005, 13–15)

At this stage, Patent Owner does not make any arguments that are specific to this limitation. *See* Prelim. Resp.

d. Default Level of Quantization

Claim 1 recites, in part, "defining a default level of quantization for use in encoding of the digital video sequence to quantize the sets of transform coefficient values; and providing an indication of the default level of quantization to a decoding process." Ex. 1001, 25:56–60.

Petitioner relies on the following annotated code for MPEG-1's encoder, which divides each DCT coefficient by the product of the

corresponding element in *niqmatrix* and *quantscale*. Pet. 11–12 (citing Ex. 1005, 115; Ex. 1003 ¶ 103).

```
int coefforig;    /* original coefficient */
int coeffquant;   /* quantized coefficient */
int coeffrec;     [/]* reconstructed coefficient */
int niqmatrix;    /* non-intra quantization matrix */
int quantscale;   /* quantizer scale */

coeffqant = (8 * coefforig) / (quantscale * niqmatrix)
```

Although claim 1 recites an encoder, the decoder's code is relevant because the code shows how the data is used. For example, Petitioner relies on the following annotated code for reconstructing the DCT coefficients at the decoder. *Id.* at 11 (citing Ex. 1005, 53; Ex. 1003, ¶ 102).

```
for ( m=0; m<8; m++ ) {
    for ( n=0; n<8; n++ ) {
        i = scan[m][n];
        dct_recon[m][n]=(((2 * dct_zz[i]) + Sign(dct_zz[i])) *
                quantizer_scale * non_intra_quant[m][n])/16;
        if (( dct_recon[m][n] & 1 ) == 0 )
            dct_recon[m][n] = dct_recon[m][n] – Sign(dct_recon[m][n]);
        if (dct_recon[m][n] > 2047) dct_recon[m][n] = 2047;
        if (dct_recon[m][n] < -2048) dct_recon[m][n] = -2048;
        if ( dct_zz[i] == 0 )
                dct_recon[m][n] = 0;
    }
}
```

According to Petitioner, MPEG-1's decoder multiplies *quantizer_scale* by the *non_intra_quant* matrix to reconstruct DCT coefficients (*dct_recon*) at the decoder. *Id.* (citing Ex. 1005, 53; Ex. 1003 ¶ 102).

According to the Petition, a person of ordinary skill in the art "would have understood 'defining' a default level of quantization in an encoder encompasses selecting or determining the level of quantization to be used until the next update." *Id.* at 16 (citing Ex. 1003 ¶ 128). To support this view, Petitioner points to the following paragraph from the challenged patent's specification:

> Advantageously, the default level of quantization to be used throughout encoding of the digital video sequence to quantize the sets of transform coefficient values can be updated during encoding of the digital video sequence and a further indication indicative of the updated default level of quantization is provided.

Ex. 1001, 12:19–24, *cited in* Pet. 16 (emphasis added).

Petitioner argues that, like the update in the challenged patent, MPEG-1's encoder sets the value of *load_non_intra_quantizer_matrix* to 1, and the values that follow in the sequence header are the quantization level selected or determined by the encoder. Pet. 16–17 (Ex. 1003 ¶ 128); *id.* at 15–16 (citing Ex. 1003 ¶ 124; Ex. 1005, 36, 42–43, 83). Petitioner argues that, when *load_non_intra_quantizer_matrix* equals 0, the default matrix with all values set to 16 is used to quantize the frames until the next occurrence of the sequence header. *Id.* at 15 (citing Ex. 1003 ¶¶ 120–23; Ex. 1005, 36, 42, 83–84). In either case, MPEG-1 teaches or suggests the claimed "defining a default level of quantization for use in encoding of the digital video sequence," according to Petitioner. Pet. 17 (citing Ex. 1003 ¶ 128).

i. Updating During Encoding

Patent Owner argues that the challenged patent states that the default level of quantization "can be updated *during* encoding of the digital video sequence." Prelim. Resp. 22 (quoting Ex. 1001, 12:21–23) (emphasis added). Patent Owner argues that "MPEG-1's quantizer matrix cannot be updated *within* a video sequence." *Id.* (emphasis added). Here, we emphasize "during" and "within" because the basis for Patent Owner's argument is that MPEG-1's default level is the only level available within a sequence. *Id.* According to Patent Owner, pictures that fall outside of the defined sequence do not use information in the sequence header, and Petitioner does not explain how the digital video sequence would span across a sequence header. *Id.* (citing Ex. 2001 ¶ 86).

Although Patent Owner focuses on the language "during encoding of the digital video sequence" from the specification (Prelim. Resp. 22 (citing Ex. 1001, 12:21–23)), claim 1 does not recite that same language. *See id.* at 25:56–60. But claim 4 does. *See id.* at 26:2–3. So, considering claim differentiation, we question whether claim 1 requires the updating-during-encoding feature.

Even so, in the challenge to claim 4, Petitioner explains that "[a] coded video commences with a sequence header followed by one or more groups of pictures, and before each group of pictures, there may be another sequence header." Pet. 19 (citing Ex. 1005, 32). As in the challenge to claim 1, Petitioner explains that MPEG-1 uses the *non_intra_quantizer_matrix* until the next sequence-header occurrence. *Id.* (citing Ex. 1005, 42–43).

These assertions are supported by MPEG-1's statement that "the quantization matrices may be changed *inside* the video sequence as

required." Ex. 1005, 32 (emphasis added), *cited in* Pet. 19. For example, MPEG-1 repeats the sequence header to allow random access into the video sequence. *Id.* Thus, Petitioner's argument about the *load_non_intra_quantizer_matrix* in its analysis for claim 1 (Pet. 15) is sufficiently supported on this record to show that MPEG-1 has the updating feature encompassed by claim 1.

ii. The Quantizer Matrix

Patent Owner argues that "Petitioner confuses the role of MPEG-1's quantizer scale and quantizer matrix in an attempt to find a 'default level of quantization for use in encoding of the digital video sequence' within MPEG-1." Prelim Resp. 17. Patent Owner argues that MPEG-1 applies the quantizer scale, signaled at the slice or macroblock layer, at "the same level of operation" as the quantization matrix during inverse quantization. *Id.* at 17–18. In Patent Owner's view, MPEG-1's quantizer matrix, relied on by Petitioner to teach the recited limitation, is "a map of how to apply the level of quantization," but it "does not *signal* a level of quantization." *Id.* at 21 (citing Ex. 2001 ¶¶ 84–85) (emphasis added). Similarly, Patent Owner also argues that "MPEG-1's quantizer matrix only *signals* whether the quantizer scale (i.e., the level of quantization) is uniformly applied to a block." *Id.* at 19 (emphasis added).

We note that claim 1 recites "defining a default level of quantization," not signaling. Ex. 1001, 25:56. Still, we disagree with Patent Owner's argument even under its own implicit construction here because, when an MPEG-1 encoder sets *load_non_intra_quantizer_matrix* to 1, the encoder signals that the values that follow in the sequence header form the *non_intra_quantizer_matrix*, for example. Pet. 19.

Patent Owner argues that the default *non_intra_quantizer_matrix* contains all 16s. Prelim. Resp. 21. In Patent Owner's view, such a default matrix provides "no meaningful operation in the inverse quantization" because it is divided by 16, which amounts to multiplying the quantization scale by 1. *Id.* (citing Pet. 11). Patent Owner argues that the *quantizer_scale* is the actual level of quantization. *Id.* at 19.

Patent Owner's argument about the default quantizer matrix (*id.* at 21) mischaracterizes the Petition because it ignores Petitioner's reliance on the scenario in which the values are provided in the sequence header:

> A POSITA would have further understood when an MPEG-1 encoder determines the value of "load_non_intra_quantizer_matrix," discussed above, the encoder is selecting or determining a level of quantization. Saber, ¶128. Similarly, when an MPEG-1 encoder sets "load_non_intra_quantizer_matrix" to "1," the values that follow in the sequence header (for the non_intra_quantizer_matrix) are levels of quantization selected or determined by the encoder. Saber, ¶128. In either case, MPEG-1 "define[s] a default level of quantization." Saber, ¶128.

Pet. 16–17. Here, Petitioner explains that the value of *load_non_intra_quantizer_matrix* is central to its reasoning about defining the default quantization level. *See id.* Yet Patent Owner's arguments focus on one particular scenario in which *load_non_intra_quantizer_matrix* equals 0. *See* Prelim. Resp. 21. In doing so, Patent Owner's arguments fail to account for Petitioner's reliance on how the different values of *load_non_intra_quantizer_matrix* signal the quantization levels. *See* Pet. 16–17.

At this stage, we also disagree with Patent Owner's argument that "Petitioner makes no attempt to explain how the quantizer matrix is used to

quantize DCT coefficients." Prelim. Resp. 17. The Petition reproduces and annotates code from MPEG-1 showing that *non_intra_quantizer_matrix* and *quantizer_scale* are multiplied to reconstruct the DCT coefficients at the decoder (Ex. 1005, 53, *cited in* Pet. 11), and the *load_non_intra_quantizer_matrix* value determines the *non_intra_quantizer_matrix* (*see* Pet. 16–17).
Petitioner explains that the encoder uses *niqmatrix* and *quantscale* (Pet. 11–12), which are the "non-intra quantization matrix" and the "quantizer scale," as defined in the quoted code block:

```
int niqmatrix /* non-intra quantization matrix */
int quantscale /* quantizer scale */
```

Ex. 1005, 115, *quoted in* Pet. 11–12. Petitioner sufficiently explains how the encoder divides each DCT coefficient by the product of *quantscale* and a corresponding element in *niqmatrix*. Pet. 11–12. This operation is shown in the cited code:

```
coeffquant = (8 * coefforig)/(quantscale * niqmarix);
```

Ex. 1005, 115, *quoted in* Pet. 11–12. Here, *coeffquant* is the quantized coefficient:

```
int coeffquant /* quantized coefficient */
```

Id.

Thus, at this stage, Petitioner has sufficiently shown that MPEG-1 teaches or suggests "defining a default level of quantization for use in encoding of the digital video sequence to quantize the sets of transform coefficient values; and providing an indication of the default level of quantization to a decoding process." Ex. 1001, 25:56–60.

e. Summary

At this stage and on this record, it is reasonably likely that Petitioner would prevail in showing that claim 1 is unpatentable based on MPEG-1.

3. Claims 2–23

Apart from the arguments discussed above, Patent Owner does not present arguments specifically directed to claims 2–23. *See* Prelim. Resp. Even so, Petitioner has the burden to show that the challenged claims are unpatentable. Thus, we have reviewed Petitioner's arguments and evidence submitted in connection with claims 2–23. We find Petitioner's arguments and evidence to be sufficient for purposes of institution.

4. Conclusion

Although the above analysis states that we disagree with Patent Owner's arguments or agree with Petitioner's, a trial could produce additional evidence that may support a determination in the Final Written Decision that unpatentability has not been adequately proven. Everything above should be viewed in that context and should not be understood to be a final determination.

D. Obviousness over H.263

Petitioner asserts that claims 1–22 are unpatentable as obvious over H.263. Pet. 2, 44–86. Because Petitioner has demonstrated a reasonable likelihood of success in demonstrating that at least one claim of the '148 patent is unpatentable, we institute *inter partes* review as to claims 1–23 of the '148 patent and all the grounds challenging these claims raised in the Petition. *See* 37 C.F.R. § 42.108(a). Thus, at this stage, it is not necessary for us to provide another assessment of claim 1 under this asserted H.263

ground. Even so, we separately address claims 1 and 12 to provide additional guidance to the parties.

1. H.263

H.263 is a video-coding standard published in 1998. Ex. 1006, 1. H.263 is a hybrid of inter-picture prediction that uses temporal redundancy and transform coding to reduce spatial redundancy. *Id.*, Summary.[3] H.263 uses four primary layers: Picture, Group of Blocks (GOB),[4] Macroblock, and Block. *Id.* at 13. At the Picture layer, a fixed-length (5-bit) codeword (*PQUANT*) indicates the quantizer to be used for the picture until the next update. *Id.* at 30. The next update is indicated by codewords *GQUANT* or *DQUANT*. *Id. GQUANT* is at the GOB layer (*id.* at 32–33), and *DQUANT* is at the Macroblock layer (*id.* at 33, 37).

2. Claim 1

At this stage, the limitation central to the dispute is the default level of quantization appearing in the last two steps: "defining *a default level of quantization for use in encoding of the digital video sequence* to quantize the sets of transform coefficient values; and providing an indication of the default level of quantization to a decoding process." Ex. 1001, 25:56–60 (emphasis added).

a. The Petition

Petitioner argues that, in the complaint from the co-pending litigation, Patent Owner has identified parameters in H.264 (Ex. 1009) as examples of

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[3] The Summary appears on the third page of Exhibit 1006. Apart from citing the summary section here, this decision uses the publication's native pagination.

[4] This could also be a slice or a video-picture segment layer. Ex. 1006, 13.

the claimed default level of quantization. Pet. 51 (citing Ex. 1007, 415–16, 424–30; Ex. 1009, 32, 36, 41; Ex. 1003 ¶¶ 264–67). According to Petitioner, those parameters set quantization at the Picture, Slice, and Macroblock layers, with the highest being the Picture layer. *Id.* Petitioner argues that, under Patent Owner's argument in the co-pending litigation, H.263's *PQUANT*, signaled at the Picture layer, falls within the scope of the claimed default level of quantization. *Id.*

b. Patent Owner's Response

Patent Owner disagrees with Petitioner's characterization of the H.264 parameters identified in the complaint from the co-pending litigation. Prelim. Resp. 24. According to Patent Owner, the H.264 parameters set the default level of quantization for multiple pictures in a picture parameter set, not just one picture. *Id.* at 25–26 (citing Ex. 1009, 5).

Patent Owner argues that, unlike H.264, H.263 signals *PQUANT* at the Picture layer. *See, e.g.*, *id.* at 26 (citing Pet. 53). According to Patent Owner, "A picture-by-picture quantization level cannot satisfy [claim 1's] requirement that a default level be used for a sequence." *Id.* at 25.

c. Analysis

We construe the claims using the same claim construction standard as in a civil action under 35 U.S.C. § 282(b), "in accordance with the ordinary and customary meaning of such claim as understood by one of ordinary skill in the art and the prosecution history pertaining to the patent." 37 C.F.R. § 42.100(b) (2024).

Neither party provides sufficient evidence that "a default level of quantization for use in encoding of the digital video sequence" encompasses a picture-by-picture quantization level. Petitioner's sole basis for interpreting

the claim in this way is its view of Patent Owner's complaint in the co-pending litigation (Pet. 51), and Patent Owner expressly disagrees with both Petitioner's interpretation of the complaint and the corresponding implicit claim construction derived from it (Prelim. Resp. 25).

For purpose of institution, we preliminarily determine that claim 1 requires a sequence-level parameter. The claims themselves provide "substantial guidance" regarding the meaning of claim language. *Phillips v. AWH Corp.*, 415 F.3d 1303, 1314 (Fed. Cir. 2005) (en banc). Here, claim 1 recites that the level is for encoding a "sequence." Ex. 1001, 25:56–60. Claim 1 expressly recites that "the digital video sequence compris[es] a number of frames." *Id.* at 25:43–44. In this way, claim 1 defines a sequence to exclude a single picture.

This reading is consistent with the specification's focus on a sequence-level solution. According to the '148 patent, "The present invention improves prior art solutions for indicating QP related information by introducing a *sequence level* QP" (SQP). *Id.* at 11:25–27 (emphasis added). Indeed, Petitioner acknowledges that the SQP is the purported improvement. *See* Pet. 5. Patent Owner agrees. *See, e.g.*, Prelim. Resp. 8–9, 25–26. Claims are not normally interpreted "in a way that excludes embodiments disclosed in the specification." *Oatey Co. v. IPS Corp.*, 514 F.3d 1271, 1276 (Fed. Cir. 2008).

A trial could produce additional evidence that may support a determination in the Final Written Decision that defining a picture-by-picture quantization level is somehow "for use in encoding of the digital video sequence." But, at this stage, the parties have given us little reason to adopt such a construction.

There is no dispute that H.263 signals *PQUANT* at the Picture layer. Pet. 51; Prelim. Resp. 25. Indeed, the basis for Petitioner's challenge is that *PQUANT* defines the quantizer for a picture and is updated for GOBs or macroblocks within the picture. Pet. 53. We disagree with the interpretation used in Petitioner's challenge: a picture-layer quantization parameter falls within the scope of the claim. *Id.* at 51. Rather, for the reasons discussed above, we preliminarily determine that the claims require a sequence-level parameter. And Petitioner has not sufficiently explained why *PQUANT* is a sequence-level parameter. Thus, we cannot conclude that Petitioner has shown a reasonable likelihood of prevailing in its challenge to claim 1 with respect to H.263. *See id.*; Prelim. Resp. 25.

3. Claim 12

Independent claim 12 recites, in part,

> means for selecting a default level of quantization for quantizing said sets of transform coefficient values; and
>
> means for providing an indication of said default level of quantization in the encoded bit stream representative of the digital video sequence.

Ex. 1001, 26:58–62.

Petitioner argues that the control manager is the corresponding structure for the "means for selecting" in claim 12 and the video-multiplex coder is the corresponding structure for the "means for providing." Pet. 8 (citing Ex. 1001, 6:16–22; 19:60–65). According to the '148 patent, control manager 660 provides an indication of the sequence-level quantization parameter (SQP) to the video multiplex coder, which inserts an indication of the SQP value into a bitstream of coded image information. Ex. 1001, 19:60–65, *cited in* Pet. 8.

Petitioner argues that "H.263 discloses or suggests 'selecting a default level of quantization for quantizing said sets of transform coefficient values' for the same reasons as described in §VII.B.2.a(iv)" of the Petition (Pet. 76 (citing Ex. 1003 ¶ 358)), which contains Petitioner's analysis of the corresponding limitation in claim 1 (*see id.* at 51). But as discussed in Section II.D.2 above, Petitioner relies on a quantization level at the picture level, not the sequence level, in its analysis of claim 1. Pet. 51. At this stage, we agree with Patent Owner that Petitioner has not shown a reasonable likelihood of prevailing in showing claim 12 is unpatentable because Petitioner offers no additional explanation of why H.263's Picture-layer quantization parameter meets the claimed "means for selecting" and "means for providing" in claim 12. Prelim. Resp. 26.

4. Claims 4–11 and 14–22

Claims 4–11 and 14–22 directly or indirectly depend from claims 1 or 12. Because claims 4–11 and 14–22 incorporate the features of claims 1 and 12 via their dependency and Petitioner has not offered any additional reasoning specific to the dependent claims to address the deficiencies discussed above, Petitioner has not shown a reasonable likelihood of prevailing in showing that the dependent claims are unpatentable. *See* Sections II.D.2–3 *supra*.

III. CONCLUSION

Petitioner has shown a reasonable likelihood of prevailing as to the unpatentability of at least one challenged claim. Thus, we institute an *inter partes* review on all challenged claims and on all grounds in the Petition.

IV. ORDER

It is

ORDERED that, under 35 U.S.C. § 314(a), an *inter partes* review of claims 1–23 of the ’148 patent is instituted for all grounds in the Petition; and

FURTHER ORDERED that, under 35 U.S.C. § 314(a), *inter partes* review of the ’148 patent is instituted on this Decision’s entry date, and under 35 U.S.C. § 314(c) and 37 C.F.R. § 42.4, notice is given of the trial’s institution.

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