

UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE PATENT TRIAL AND APPEAL BOARD

UNIFIED PATENTS, LLC,
Petitioner,

v.

IDEAHUB INC.,
Patent Owner.

PGR2022-00044
Patent 11,122,274 B2

Before STACEY G. WHITE, KEVIN W. CHERRY, and
MONICA S. ULLAGADDI, *Administrative Patent Judges*.

ULLAGADDI, *Administrative Patent Judge*.

JUDGMENT
Final Written Decision
Determining All Challenged Claims Unpatentable

I. INTRODUCTION

Unified Patents, LLC (“Petitioner”) filed a Petition (Paper 2, “Petition” or “Pet.”) requesting post-grant review of claims 1–13 of U.S. Patent No. 11,122,274 B2 (Ex. 1001, “the ’274 patent”), accompanied by the supporting Declaration of Dr. Immanuel Freedman (Ex. 1005). Ideahub Inc. (“Patent Owner”) filed a Preliminary Response (Paper 6, “Preliminary Response” or “Prelim. Resp.”), accompanied by the supporting Declaration of Dr. Clifford Reader (Ex. 2001). Pursuant to Board authorization, Petitioner filed a Reply to the Patent Owner Preliminary Response (Paper 8) and Patent Owner filed a Sur-reply to Petitioner’s Reply (Paper 9).

Upon review of these papers, we instituted post-grant review, pursuant to 35 U.S.C. § 324, as to the challenged claims based on the challenges set forth in the Petition. Paper 10 (“Institution Decision” or “Inst. Dec.”).

Subsequent to institution, Patent Owner filed a Patent Owner Response (Paper 14, “PO Resp.”), Petitioner filed a Reply to Patent Owner’s Response (Paper 19, “Pet. Reply”), and Patent Owner filed a Sur-Reply (Paper 21, “Sur-Reply”). On November 6, 2023, we held an oral hearing. A transcript of the hearing is of record. Paper 26.

For the reasons that follow, we conclude that Petitioner has proven by a preponderance of the evidence that the challenged claims of the ’274 patent are unpatentable.

II. BACKGROUND

A. *Real Parties in Interest*

Petitioner (i) identifies Unified Patents, LLC as a real party-in-interest. Pet. 1. Patent Owner provides that “[t]he real parties-in-interest are Ideahub Inc. and Access Advance LLC (f/k/a HEVC Advance LLC).” Paper 3, 1.

B. *Related Matters*

The parties submit that the ’274 patent is related to U.S. Patent No. 9,641,849, which was the subject of the IPR2020-00702 proceeding (“the ’702IPR”), in which the final written decision was appealed to the Federal Circuit by Patent Owner. Pet. 1 (citing *IdeaHub Inc. v. Unified Patents, LLC*, Appeal No. 2022-1160); Paper 3, 1. The Federal Circuit affirmed the Board’s decision in ’702IPR. Ex. 1044 (*IdeaHub Inc. v. Unified Patents, LLC*, No. 2022-1160, 2023 WL 1878575 (Fed. Cir. Feb. 10, 2023)).

The parties also identify U.S. Patent Application No. 17/407,865, which is pending and is a continuation of the application that led to the ’274 patent. Pet. 1; Paper 3, 1. A Notice of Allowance was mailed in connection with U.S. Patent Application No. 17/407,865 on November 28, 2023.

C. *The ’274 Patent*

The ’274 patent is titled “Video Encoding Apparatus, Video Decoding Apparatus, and Video Decoding Method for Performing Intra-Prediction Based on Directionality of Neighboring Block,” and concerns “a video compression method and, more particularly, to a method and apparatus for improving compression efficiency in directional intra-prediction.” Ex. 1001, code (54) (Title), 1:27–31.

The '274 patent addresses the problem of “overhead increasing the size of a coded bitstream” in the intra-prediction technique of the H.264 standard. *See id.* at 2:8–20, 2:21–25, 3:15–25, 3:26–33. The '274 patent explains that

the intra-prediction according to an example embodiment of the present invention selects the intra mode of the current block on the basis of the directionality of the neighboring blocks that have already been reconstructed. By contrast, the existing H.264 is different from example embodiments of the present invention in that it employs a method of performing the intra-prediction on the current block using the nine intra modes and selecting the intra mode having a minimum cost, rather than the method of selecting the intra mode of the current block on the basis of the directionality of the neighboring blocks that have already been reconstructed as in example embodiments of the present invention.

Id. at 6:30–42; *see id.* at 5:48–52.¹

Figure 5, reproduced below, depicts a video encoder. *Id.* at 5:37–39.

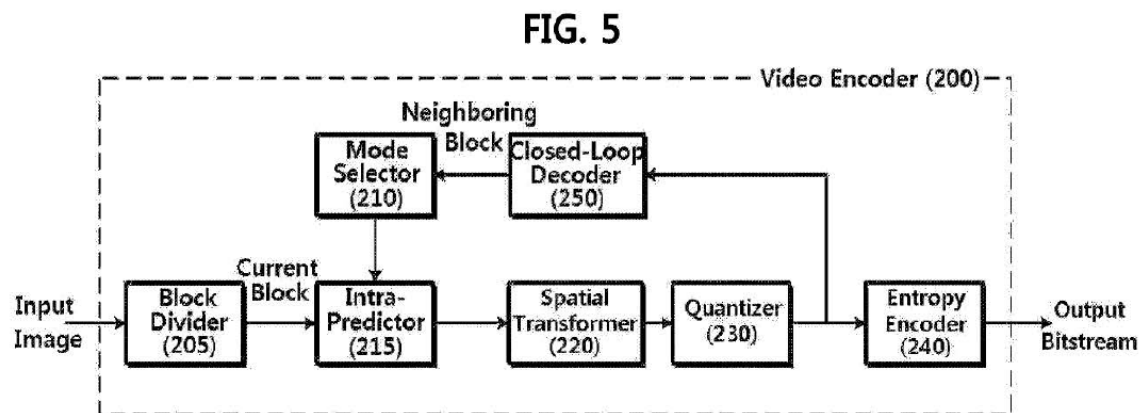


Figure 5 is a block diagram of a video encoder 200. *Id.* at 5:37–39.

¹ The claims recite “intra prediction mode” and the Specification primarily uses the term “intra mode.” The current record does not indicate that these terms have different meanings. For purposes of this Decision, we use “intra prediction mode” and “intra mode” interchangeably, as appropriate.

In Figure 5, video encoder 200 is depicted as including block divider 205, mode selector 210, intra-predictor 215, spatial transformer 220, quantizer 230, entropy encoder 240, and closed-loop decoder 250. *Id.* at 5:37–43.

Block divider 205 divides an input image into blocks of a predetermined size according to whether the input image is a chrominance signal or a luminance signal, or according to some other condition. *Id.* at 5:44–57.

Mode selector 210 selects a mode suitable for the current block from among a plurality of intra modes using “directionality” of neighboring blocks of the current block, the neighboring blocks already having been reconstructed before the current block is reconstructed. *Id.* at 5:57–67. The ’274 patent discloses, in its exemplary embodiments, that “the description will be made on the assumption that a current block to be encoded is a block having a 4×4 size and has a total of nine intra modes (mode 0 through mode 8).” *Id.* at 5:48–52. In the encoder in Figure 5, the neighboring blocks may be obtained from an image reconstructed by closed-loop decoder 250, i.e., by encoding and decoding, rather than being obtained from the original input, and provided to mode selector 210. *Id.* at 6:43–63. Intra-predictor 215 obtains a prediction block of the current block according to the intra mode selected by mode selector 210 and subtracts the obtained prediction block from the current block, thereby obtaining a residual block. *Id.* at 6:64–7:15.

Figure 6, reproduced below, depicts video decoder 500 including entropy decoder 510, dequantizer 520, inverse spatial transformer 530, mode selector 540, intra reconstructor 550, and inter reconstructor 560. *Id.* at 8:15–19.

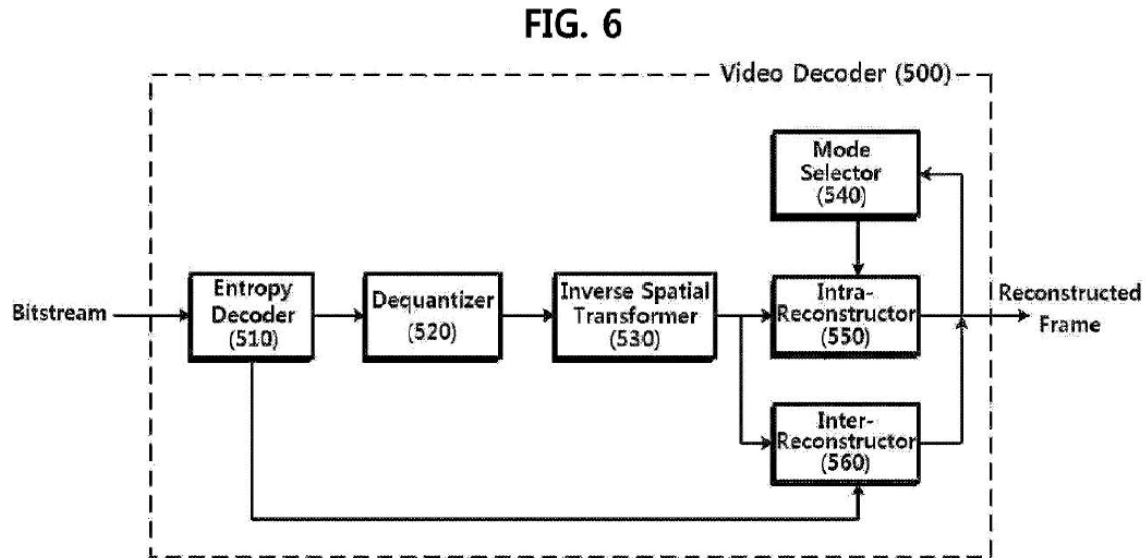


Figure 6 is a block diagram of a video decoder 500 that performs operations reciprocal to those of a video encoder. *Id.* at 8:12–49.

Mode selector 540 selects an intra mode suitable for a current block from among a plurality of intra modes (e.g., intra modes **0** through **8**) using directionality of neighboring blocks of the current block. *Id.* at 9:46–49. Neighboring blocks may include, for example, an upper block, a left block, an upper left block, and an upper right block, all of which have already been reconstructed with respect to the current block. *Id.* at 8:55–60. The '274 patent discloses that video decoder 500 need not receive information about the intra mode from video encoder 200. *Id.* Intra reconstructor 550 then obtains a prediction block of the current block according to the intra mode selected by mode selector 540, adds the prediction block and the residual signal of the current block provided from inverse spatial transformer 530, and reconstructs the current block. *Id.* at 8:63–9:5.

In Figure 4, reproduced below, the directionalities of the nine intra modes are depicted.

FIG. 4

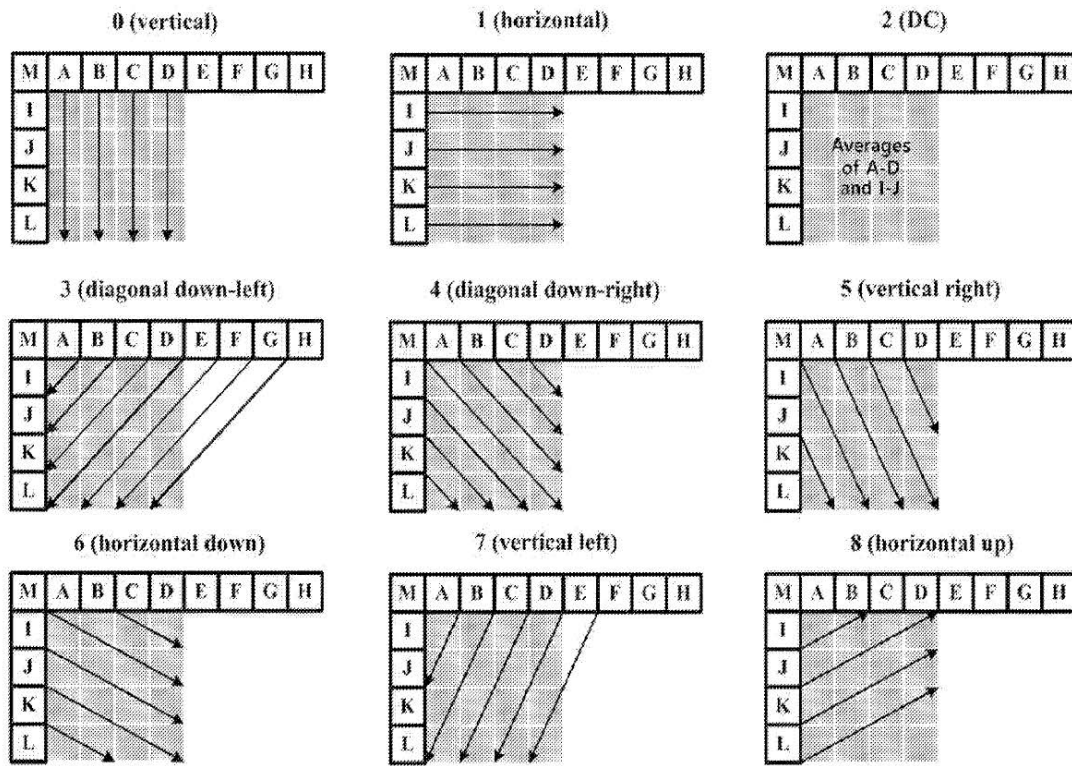


Figure 4 depicts 8 directionalities of intra modes and one non-directional intra mode, intra mode 2.

Mode selector 540 calculates a cost C_i with respect to a specific directionality i by means of a sum (or an average) of deviations according to the directionalities, using the following equation (Equation 2):

$$C_i = \sum_{k=0}^{n-1} D_{ik}.$$

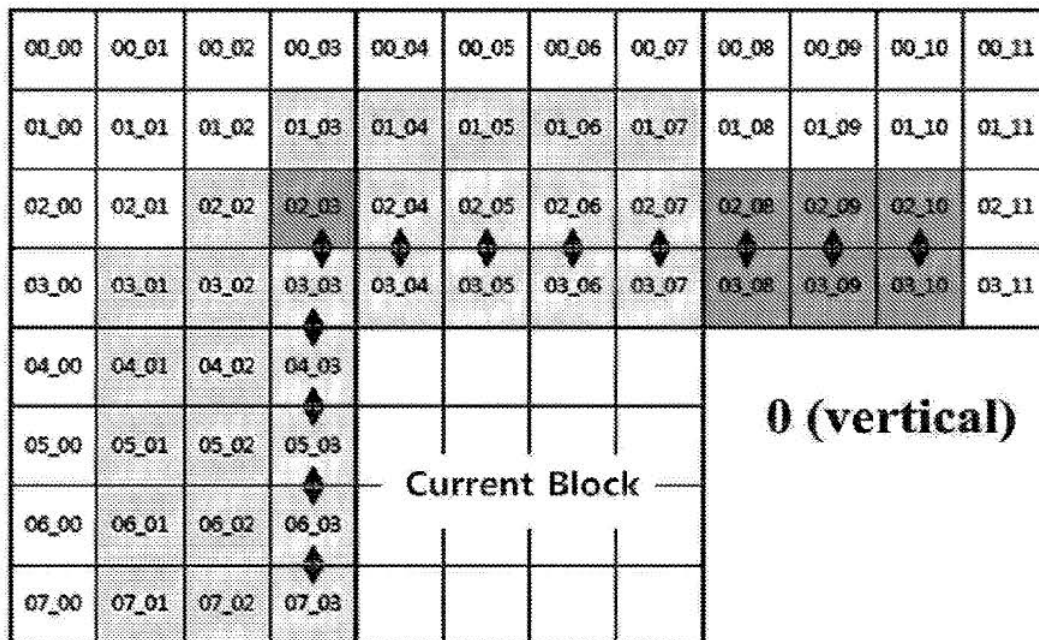
Id. at 9:50–60. In Equation 2, n is the number of pixel pairs k for calculating the deviation, i is the intra mode number, and D_{ik} is the deviation between the pixel pairs k corresponding to the specific directionality i . *Id.* at 9:61–64. The '274 patent also explains that “since the cost C_2 of mode 2 of the intra modes is calculated by an average without directionality, D_{ik} ($i=2$) of Equation 2 can be obtained from Equation 3:”

$$D_{2k} = |\mu - p_k|.$$

Id. at 10:27–32.

According to the '274 patent, “[t]he symbol *n* may be selected by another number depending on an embodiment,” and “[i]n example embodiments of the present invention, the description will be made on the assumption that *n* is set to 12.” *Id.* at 9:64–67. Figure 7A, reproduced below, depicts pixel pairs selected from neighboring blocks in the vertical direction.

FIG. 7A



In Figure 7A, 12 pixel pairs are selected from neighboring blocks of the current block for calculating a cost of vertical intra mode 0.

Figure 7B depicts the pixel pairs that are selected from neighboring blocks for non-directional intra mode 2. Figures 7C through 7H depict the pixel pairs that are selected for each directionality of intra modes 1 and 3–8.

D. Illustrative Claims

Petitioner challenges claims 1–13 of the '274 patent. Pet. 3. Claims 1, 7, and 13 are independent. Claims 1 and 7 are illustrative and reproduced below.

1. [1.0] A video decoding method performed by a video decoding apparatus, the method comprising:

[1.1] determining a neighboring intra prediction mode associated with a neighboring block, the neighboring block being adjacent to a current block;

[1.2] determining a current intra prediction mode associated with the current block based on whether the neighboring intra prediction mode associated with the neighboring block has directionality or not;

[1.3] performing intra-prediction based on the current intra prediction mode associated with the current block to generate a prediction block associated with the current block;

[1.4] obtaining transform coefficients;

[1.5] dequantizing the transform coefficients to generate dequantized transform coefficients;

[1.6] transforming the dequantized transform coefficients to generate a residual block associated with the current block; and

[1.7] reconstructing the current block based on the prediction block and the residual block,

[1.8.0] wherein determining the current intra prediction mode associated with the current block comprises:

[1.8.1] determining candidate intra prediction modes associated with the current block according to a first set of two or more mathematical expressions, when the neighboring intra prediction mode associated with the neighboring block has no directionality,

[1.8.2] determining candidate intra prediction modes associated with the current block according to a second set of two or more mathematical expressions, when the neighboring intra prediction mode associated with the neighboring block has directionality,

[1.8.3] selecting the current intra prediction mode associated with the current block among the candidate intra prediction modes,

[1.8.4] wherein the second set of two or more mathematical expressions is different from the first set of two or more mathematical expressions,

[1.8.5] wherein the second set of two or more mathematical expressions use the neighboring intra prediction mode associated with the neighboring block, and

[1.8.6] the neighboring block includes an upper block adjacent to the current block.

7. A video encoding method performed by a video encoding apparatus, the method comprising:

determining a current intra prediction mode associated with a current block;

performing intra-prediction according to the current intra prediction mode associated with the current block to generate a prediction block associated with the current block;

determining a neighboring intra prediction mode associated with a neighboring block, the neighboring block being adjacent to the current block;

encoding the current intra prediction mode associated with the current block based on whether the neighboring intra prediction mode associated with the neighboring block has directionality or not;

obtaining a residual block associated with the current block by using the prediction block and the current block;

transforming the residual block to generate transform coefficients;

quantizing the transform coefficients to generate quantized transform coefficients;

encoding the quantized transform coefficients, wherein the encoding the current intra prediction mode associated with the current block comprises:

determining candidate intra prediction modes associated with the current block according to a first set of two or more mathematical expressions, when the neighboring intra prediction

mode associated with the neighboring block has no directionality,

determining candidate intra prediction modes associated with the current block according to a second set of two or more mathematical expressions, when the neighboring intra prediction mode associated with the neighboring block has directionality,

encoding the current intra prediction mode associated with the current block based on the candidate intra prediction modes,

wherein the second set of two or more mathematical expressions is different from the first set of two or more mathematical expressions,

wherein the second set of two or more mathematical expressions use the neighboring intra prediction mode associated with the neighboring block, and

the neighboring block includes an upper block adjacent to the current block.

Ex. 1001, 11:51–12:29, 12:55–13:33 (bracketed identifying labels added in accordance with Petitioner’s labeling, *see* Pet. 49–76).

E. Asserted Grounds

Petitioner presents the following challenges as summarized in the chart below. Pet. 4–5, 44, 82.

Ground	Claims Challenged	35 U.S.C. §	Reference(s)/Basis
1A	1–4, 6	102 ²	HEVC265 ³
1B	1–4, 6	103	HEVC265
2	1–13	112(a)	Lack of Written Description

III. ANALYSIS

A. *Legal Standards*

“The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same.” 35 U.S.C. § 112(a). The Federal Circuit “has consistently held that

² Per the Manual of Patent Examining Procedure (MPEP) § 2159.02, America Invents Act (“AIA”) 35 U.S.C. §§ 102, 103 took effect on March 16, 2013. AIA 35 U.S.C. §§ 102, 103 apply to any patent application that contains or contained at any time a claim to a claimed invention that has an effective filing date that is on or after March 16, 2013. If a patent application (1) contains or contained at any time a claim to a claimed invention having an effective filing date as defined in 35 U.S.C. § 100(i) that is on or after March 16, 2013 or (2) claims or ever claimed the benefit of an earlier filing date under 35 U.S.C. §§ 120, 121, or 365 based upon an earlier application that ever contained such a claim, then AIA 35 U.S.C. §§ 102, 103 apply to the application, (i.e., the application is an AIA application). If there is ever even a single claim to a claimed invention in the application having an effective filing date on or after March 16, 2013, AIA 35 U.S.C. §§ 102, 103 apply in determining the patentability of every claimed invention in the application. This is the situation even if the remaining claimed inventions all have an effective filing date before March 16, 2013, and even if a claim to a claimed invention having an effective filing date on or after March 16, 2013, is canceled. The application of AIA 35 U.S.C. §§ 102, 103 is discussed in detail in Section III.C *infra*.

³ Recommendation ITU-T H.265 (ITU-T SERIES H Recommendations: AUDIOVISUAL AND MULTIMEDIA SYSTEMS, **High efficiency video coding**) (April 2013) (Ex. 1006, hereinafter “HEVC265”).

§ 112, first paragraph, contains a written description requirement separate from enablement.”⁴ *Ariad Pharm., Inc. v. Eli Lilly & Co.*, 598 F.3d 1336, 1351 (Fed. Cir. 2010) (en banc). “[T]he test for sufficiency [of the written description] is whether the disclosure of the application relied upon reasonably conveys to those skilled in the art that the inventor had possession of the claimed subject matter as of the filing date.” *Id.*

“A claim is anticipated only if each and every element as set forth in the claim is found, either expressly or inherently described, in a single prior art reference.” *Verdegaal Bros., Inc. v. Union Oil Co. of California*, 814 F.2d 628, 631 (Fed. Cir. 1987).

A patent claim is unpatentable under 35 U.S.C. § 103 if the differences between the claimed subject matter and the prior art are such that the subject matter, as a whole, would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. *KSR Int’l Co. v. Teleflex Inc.*, 550 U.S. 398, 406 (2007). 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 ordinary skill in the art; and (4) when in evidence, objective evidence of nonobviousness.⁵ *Graham v. John Deere Co.*, 383 U.S. 1, 17–18 (1966).

In a post-grant review, as in an *inter partes* review, “the petitioner has the burden from the onset to show with particularity why the patent it

⁴ The AIA recodified 35 U.S.C. § 112, first paragraph, as 35 U.S.C. § 112(a). Pub. L. No. 112-29, 125 Stat. at 296–97.

⁵ Patent Owner has not presented objective evidence of nonobviousness in this proceeding.

challenges is unpatentable.” *See Harmonic Inc. v. Avid Tech., Inc.*, 815 F.3d 1356, 1363 (Fed. Cir. 2016). This burden of persuasion never shifts to Patent Owner. *Dynamic Drinkware, LLC v. Nat’l Graphics, Inc.*, 800 F.3d 1375, 1378 (Fed. Cir. 2015). In determining whether the ’274 patent is eligible for post-grant review, we consider the present record in its entirety. We analyze the challenges presented in the Petition in accordance with the above-stated principles.

B. Level of Ordinary Skill in the Art

Petitioner contends that:

A person of ordinary skill in the art at the priority date for the ’274 Patent (“POSITA”) would have had a bachelor’s degree in electrical or computer engineering, or a closely related scientific field such as physics or computer science, and two years of work experience with video processing. A lack of experience can be remedied with additional education (e.g., a Master’s degree), and likewise, a lack of education can be remedied with additional work experience (e.g., 4–5 years). This definition would apply at the earliest claimed priority date of the ’274 Patent as well as any later date.

Pet. 12 (citing Ex. 1005 ¶¶ 50–52).

Patent Owner does not dispute the level of ordinary skill in the art. *See generally* PO Resp. We adopt Petitioner’s definition as it appears to be consistent with the Specification of the ’274 patent and the cited reference.

C. Eligibility for Post-Grant Review

As a threshold matter, we must determine whether the ’274 patent is eligible for post-grant review. The post-grant review provisions set forth in section 6(d) of the Leahy-Smith America Invents Act, Pub. L. No. 112-29, 125 Stat. 284 (September 16, 2011) (“AIA”), apply only to patents subject to the first-inventor-to-file provisions of the AIA. *See* AIA § 6(f)(2)(A) (stating

that the provisions of Section 6(d) “shall apply only to patents described in section 3(n)(1)”). Patents subject to the first-inventor-to-file provisions are those that issue from applications “that contain[] or contained at any time . . . a claim to a claimed invention that has an effective filing date as defined in section 100(i) of title 35, United States Code, that is on or after” March 16, 2013. AIA § 3(n)(1).

Our rules require that each petitioner requesting post-grant review certify that the challenged patent is available for post-grant review.³⁷ C.F.R. § 42.204(a) (“The petitioner must certify that the patent for which review is sought is available for post-grant review”). In addition, “[a] petition for a post-grant review may only be filed not later than the date that is 9 months after the date of the grant of the patent or of the issuance of a reissue patent (as the case may be).” 35 U.S.C. § 321(c). Petitioner has the burden of demonstrating eligibility for post-grant review. *See Mylan Pharms. Inc. v. Yeda Res. & Dev. Co.*, PGR2016-00010, Paper 9 at 9–10 (PTAB Aug. 15, 2016).

*I. Legal Requirements for Post-Grant Review Eligibility:
Claim 1 of the '274 patent*

The post-grant review provisions apply to a patent that contains a claim with an effective filing date on or after March 16, 2013. *See* AIA §§ 3(n)(1), 6(f)(2)(A). The '274 patent issued from U.S. Application No. 16/407,086 (“the '086 application”), filed on May 8, 2019. Ex. 1001, codes (21), (22). The '086 application was filed as (i) a continuation of U.S. Application No. 15/880,402, filed on January 25, 2018, now U.S. Patent No. 10,334,252, which in turn is (ii) a continuation of U.S. Application No. 15/447,055, filed on March 1, 2017, now U.S. Patent No. 9,918,093, which in turn is (iii) a continuation of U.S. Application No. 15/260,240 (“the '240

application”), filed on September 8, 2016, now U.S. Patent No. 9,641,849 (“the ’849 patent”), which in turn is (iv) a continuation of U.S. Application No. 12/977,928 (“the ’928 application”), filed on December 23, 2010, now U.S. Patent No. 9,467,705. *Id.* at code (63). The ’274 patent also claims priority to Korean Application KR 10-2009-0134017, which was filed on December 30, 2009. *Id.* at code (30).

Petitioner contends that the ’274 patent is eligible for post-grant review because at least one claim of the ’274 patent has an effective filing date that is later than March 16, 2013. Pet. 15. In particular, Petitioner contends “claim 1 of the ’274 Patent contains limitations that were not disclosed in the pre-AIA priority application, or indeed, in any other application in the ’274 Patent’s chain of priority” because

[l]imitation [1.1] of claim 1 recites determining a neighboring intra prediction mode associated with a neighboring block, the neighboring block being adjacent to a current block. A POSITA would not have understood that the inventors were in possession of, and actually invented, the invention in claim 1 as of the ’928 application’s filing, because the ’928 application does not determine a neighboring intra prediction mode associated with a neighboring block and does not describe an invention that relies on a determined intra prediction mode for a neighboring block.

Id. at 15, 19–20 (emphasis omitted).

We discuss the parties’ arguments about written description support in Sections III.C.2 and III.E below.

For the reasons that follow, we determine that the ’928 application does not provide sufficient written description support, for at least independent claim 1 of the ’274 patent, so as to “reasonably convey[] to those skilled in the art that the inventor had possession of the claimed subject matter as of the filing date” of the ’928 application. *Ariad*, 598 F.3d

at 1351. Accordingly, we are persuaded that the '928 application lacks sufficient written description support for the invention recited in claim 1 of the '274 patent, and thus, claim 1 does not receive an effective filing date as early as that of the '928 application (i.e., December 23, 2010).

We further determine that Petitioner filed the Petition within the 9-month statutory period for requesting post-grant review in accordance with 35 U.S.C. § 321(c). The '274 patent issued on September 14, 2021 (*see* Ex. 1001, code (45)), and the present Petition was accorded a filing date of June 9, 2022 (*see* Paper 5). Accordingly, the Petition was filed less than 9 months after the date of issuance of the '274 patent.

In view of the above, we are persuaded that the '274 patent is eligible for post-grant review.

2. *Collateral Estoppel*

Petitioner argues that collateral estoppel in a related proceeding precludes Patent Owner from arguing in favor of written description support. Pet. 37–43. In particular, Petitioner argues “[c]ollateral estoppel applies in this case and precludes Patent Owner from relitigating the issue of written description support because the identical issue was decided by the Board in IPR2020-00702.” *Id.* at 37. Petitioner argues that: (1) limitation [1.1] of claim 1 of the '274 patent is “substantively identical” to limitation [19.1] of proposed substitute claim 19, which the Board found unsupported by the '240 application in the '702IPR; (2) the issue of written description support was actually litigated and adjudged in the '702IPR; (3) the '702IPR necessarily required determination of the identical issue; and (4) the estopped party (Patent Owner) was fully represented in the '702IPR. *Id.* at 38–43.

Petitioner also contends that we should construe the claim phrase “a neighboring intra prediction mode” to be “singular in nature, despite the general rule that ‘the words ‘a’ or ‘an’ in a patent claim carry the meaning of ‘one or more.’”’” *Id.* at 21–23 (“This is because the patentee ‘evinced a clear intent to limit ‘a’ or ‘an’ to ‘one’ in this context.”). Petitioner concludes, “the claim phrase determining a neighboring intra prediction mode associated with a neighboring block must be interpreted to require a conclusive establishment of a singular intra prediction mode for a neighboring block.” *Id.* at 23 (citing Ex. 1008, 46–48) (arguing that the “panel in IPR2020-00702 interpreting claims to require determination of single intra mode of neighboring block”) (emphasis omitted).

In relevant part, limitation 1.1 of claim 1 of the ’274 patent recites “determining a neighboring intra prediction mode *associated with* a neighboring block.” Limitation 19.1 of proposed substitute claim 19.1 in the ’702IPR recites “determining an intra mode for a neighboring block of a current block.” ’702IPR, Paper 31 at 21. In our Institution Decision, we determined that

there is insufficient evidence of record to support a determination that an intra mode “for a neighboring block” as recited in proposed substitute claim 19 from the ’702IPR is somehow narrower or more conclusive than an intra prediction mode “associated with a neighboring block” as recited in claim 1 of the ’274 patent. In any event, we determine that we need not construe limitation 1.1, including, for example, to determine the metes and bounds of the claim term “associated with” because we determine that the ’928 application does not provide sufficient written description support for determining either a single intra prediction mode *or* multiple intra prediction modes *either* for or associated with a neighboring block.

Inst. Dec. 29 (citing Inst. Dec. § III.B).

Patent Owner does not expressly address collateral estoppel in its Patent Owner Response (*see generally* PO Resp.), but presents the following argument in its Sur-reply:

Petitioner’s contention that its collateral estoppel arguments are “uncontested” is contrary to the record. Both the Preliminary Response (POPR) and the POR directly contest Petitioner’s allegation that claim 1 of the instant proceeding is of substantially the same scope as claim 19 of the prior IPR, and both argue that the invalidity analysis is altered by this different scope.

Sur-Reply 1–2 (citing Prelim. Resp. 10, 20–21; Pet. Reply 2; PO Resp. 33–35, 44). We consider Patent Owner’s arguments distinguishing claim 1 of the ’274 patent and proposed substitute claim 19 in the ’702 IPR from its Patent Owner Response to the extent these arguments apply to the first factor in the discussion of collateral estoppel.⁶

Patent Owner takes the position, in the present proceeding, that “associated with” recited in limitation 1.1 of claim 1 of the ’274 patent is broader than “for” as recited in limitation 19.1 of proposed substitute claim 19 in the ’702 IPR. PO Resp. 33–34. More particularly, Patent Owner argues that “determining a neighboring intra prediction mode associated with a neighboring block” as recited in limitation 1.1 encompasses calculating multiple values of intra prediction modes for a neighboring block. *Id.* at 36–

⁶ Any argument raised in the Preliminary Response and not renewed in the Patent Owner Response is waived and will not be considered. *See* Paper 11, 9 (“The patent owner is cautioned that any arguments for patentability not raised in the response will be deemed waived.”); *see also In re NuVasive, Inc.*, 842 F.3d 1376, 1380–81 (Fed. Cir. 2016) (providing that an argument raised in a preliminary response, but omitted in the patent owner’s response, despite the PTAB’s “warn[ing] . . . that this would result in waiver,” is “abandoned” and deemed “waived”).

37 (“The prosecution history establishes that the specification’s cost function (Equation 2) in which i is specified or identified as a value from 0 through 8 in association with evaluating a neighboring block is one embodiment of claim element 1.1.”); *see id.* at 33 (citing Ex. 2008 ¶ 45) (“Patent Owner’s construction includes within its scope Equation 2’s selection of *values* of the intra mode number i for purposes of evaluating the neighboring block(s), unlike Petitioner’s interpretation.” (first emphasis added)).

Patent Owner also argues that “[u]nlike conventional H.264, in which candidate intra modes are determined for evaluation on the current block, the disclosed embodiment determines *each intra mode for evaluation on only the neighboring block(s)* ‘without using [any] information about the current block.’” *Id.* at 36 (citing Ex. 1001, 10:46–49; Ex. 1028, 20:5–7) (emphasis added). Patent Owner asserts that this “key distinction over the prior art is reflected in element 1.1’s recitation of an intra mode ‘associated with a neighboring block.’” *Id.* (citing Ex. 2008 ¶ 47). Accordingly, Patent Owner argues, this is in contrast to limitation 19.1 of proposed substitute claim 19 in the ’702IPR, which “was interpreted to be the singular intra mode used to decode the neighboring block” in the ’702IPR. PO Resp. 33–34; *see id.* at 34 (citing Ex. 2005, 3–4).⁷

Petitioner responds “associated with” as recited in limitation 1.1 of claim 1 of the ’274 patent and “for” as recited in limitation 19.1 of proposed substitute claim 19 in the ’702IPR do not have different scope. Pet. Reply 19 (citing Ex. 1022, 11). Petitioner argues that “the specification unambiguously confirms that determining an intra prediction mode, for the current block (limitation [1.2]), means determining a single intra prediction

⁷ Excerpts from New Oxford American Dictionary, Third Edition, 2010.

mode.” *Id.* at 8 (citing Ex. 1048 ¶¶ 11–19) (emphasis omitted). Petitioner further argues that, as such,

[t]his meaning must apply to *determining for a neighboring intra prediction mode associated with a neighboring block* ([1.1]), because there is a “presumption that the same terms appearing in different portions of the claims should be given the same meaning unless it is clear from the specification and prosecution history that the terms have different meanings at different portions of the claims.”

Id. (citing *PODS, Inc. v. Porta Stor, Inc.*, 484 F.3d 1359, 1366 (Fed. Cir. 2007) (internal quotations omitted)). Petitioner contends that Patent Owner

contorts the phrase *determining a neighboring intra prediction mode associated with a neighboring block* to contend “claim element 1.1 more broadly encompasses identifying, in relation to a neighboring block, a value of an intra prediction mode.” [Patent Owner] also contends the claim should “include[] within its scope Equation 2’s selection of values of the intra mode number *i* for purposes of evaluating the neighboring block(s).” But both statements require determining a neighboring intra prediction mode associated with a neighboring block to mean that one can “determine” multiple values within claim 1’s context (i.e., that determining is non-determinative), which makes little sense when considering the remainder of the claim and its mutually exclusive choice based on the determined neighboring intra mode, not nine iterations of a mutually exclusive choice. Thus, neither of these statements amount to an understandable interpretation of claim scope and cannot be adopted as a construction.

Pet. Reply 14–15 (citing PO Resp. 11, 33–38; Ex. 1049, 34:2–35:6; Ex. 1035 ¶ 89).

A party is collaterally estopped from relitigating an issue if:

(1) a prior action presents an identical issue; (2) the prior action actually litigated and adjudged that issue; (3) the judgment in that prior action necessarily required determination of the identical

issue; and (4) the prior action featured full representation of the estopped party.

VirnetX Inc. v. Apple, Inc., 909 F.3d 1375, 1377 (Fed. Cir. 2018) (citing *Stephen Slesinger, Inc. v. Disney Enterprises, Inc.*, 702 F.3d 640, 644 (Fed. Cir. 2012)).

With respect to the first factor of the collateral estoppel inquiry, neither the intrinsic evidence nor the extrinsic evidence, nor even the context of claim 1, support Patent Owner’s arguments. In this regard, neither the Specification nor the prosecution history makes a distinction between these two terms—“associated with” and “for.” Indeed, the body of the Specification uses the term “associated with” only once. Ex. 1001, 6:43–45 (“The image associated with the neighboring blocks is information that can be used in common in the video encoder as well as the video decoder.”). In this single instance, there is no indication that “associated with” means something different from “for.” The dictionary definitions also do not support a conclusion that the plain meaning of “associated with” has a broader scope than that of “for.”⁸

The portions of the ’274 patent cited by Petitioner disclose that “[o]nce the intra mode (e.g. one of the nine modes of FIG. 4) is determined by the mode selector 210, the prediction block can be obtained according to the determined intra mode.” Ex. 1001, 7:5–13.⁹ With respect to the decoder, the ’274 patent discloses that “determining the intra mode at the mode

⁸ Compare Ex. 2005, 3 (defining *associated* as, *inter alia*, “connected with something”), with *id.* at 4 (defining *for* as, *inter alia*, “on behalf of or to the benefit of . . . something”).

⁹ The ’928 application and the ’086 application, which issued as the ’274 patent, share a common specification. We refer to the ’928 application to be consistent with the parties’ contentions. See Inst. Dec. 22, n.7.

selector [540] is identical to . . . the mode selector 210.” *Id.* at 8:52–55. The ’274 patent further discloses that “[o]nce the intra mode is determined by the mode selector 540, the prediction block can be obtained according to the determined intra mode.” *Id.* at 9:1–5.

Based on these cited portions, Petitioner contends, and we agree, that “[b]y referencing mode selector 210, this ‘determining’ also clearly results in a single mode.” Pet. Reply 8 (citing Ex. 1001, 9:1–5; Ex. 1048 ¶ 17). We further agree with Petitioner that, because “determining an intra prediction mode, for the current block (limitation [1.2]), means determining a single intra prediction mode,” the same meaning of “determining,” that is, determining a singular value, should apply to limitation 1.1. *Id.* (citing *PODS*, 484 F.3d at 1366; Ex. 1048 ¶¶ 11–19) (emphasis omitted). The record does not support a conclusion that “determining” means something different in limitation 1.1 than it means in limitation 1.2 of claim 1 of the ’274 patent, contrary to Patent Owner’s arguments. More particularly, there is nothing in the Specification that supports a conclusion that “determining” should refer to determining a single intra prediction mode value for a current block, but multiple intra prediction mode values for a neighboring block.

We agree with Petitioner that the context of the claim makes clear that determining multiple intra prediction values associated with a neighboring block would make little sense in the context of the claim “when considering the remainder of the claim and its mutually exclusive choice based on the determined neighboring intra mode, not nine iterations of a mutually exclusive choice.” Pet. Reply 14–15 (citing Ex. 1049, 34:2–35:6; Ex. 1035 ¶ 89).

In view of the foregoing, with respect to the first factor of the collateral estoppel inquiry, we are persuaded that, because there is insufficient evidence of record to support a conclusion that “determining a neighboring intra prediction mode *associated with* a neighboring block” as recited in limitation 1.1 of claim 1 of the ’274 patent differs in scope from “determining an intra mode *for* a neighboring block of a current block” as recited in limitation 19.1 of proposed substitute claim 19 in the ’702IPR, the ’702IPR “present[ed] an identical issue” to an issue that needs resolution in the present proceeding.

As discussed above, Patent Owner does not contest the second, third, or fourth factors of the collateral estoppel inquiry. *See generally* PO Resp. We agree with Petitioner that the issue of written description support for “determining a neighboring intra prediction mode *associated with* a neighboring block” as recited in limitation 19.1 of proposed substitute claim 19 “was actually litigated and adjudged” in the ’702IPR; that the ’702IPR “necessarily required determination” of whether there was written description support for limitation 19.1, which is identical to the written description support issue to be decided with respect to limitation 1.1. of claim 1 in the present proceeding; and that the ’702IPR “featured full representation of the estopped party,” Patent Owner. *See* Pet. 38–43.

In view of the foregoing, we are persuaded that collateral estoppel applies to Patent Owner and its arguments addressing written description support for limitation 1.1 of claim 1 of the ’274 patent.

D. Claim Construction

In this post-grant review, filed on June 9, 2022, we construe the claims of the ’274 patent using the same claim construction standard that

would be used to construe the claim in a civil action under 35 U.S.C. § 282(b), including construing the claim 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. § 42.200(b); *see Phillips v. AWH Corp.*, 415 F.3d 1303, 1312–1314 (Fed. Cir. 2005) (en banc). In construing claims in accordance with their ordinary and customary meaning, we take into account the specification and prosecution history. *Phillips*, 415 F.3d at 1315–17.

We determine that it is not necessary to expressly construe any claim term to resolve the parties’ disputes, beyond the discussion of the scope of the “determining” limitation above. *See Nidec Motor Corp. v. Zhongshan Broad Ocean Motor Co.*, 868 F.3d 1013, 1017 (Fed. Cir. 2017) (“[W]e need only construe terms ‘that are in controversy, and only to the extent necessary to resolve the controversy.’” (quoting *Vivid Techs., Inc. v. Am. Sci. & Eng’g, Inc.*, 200 F.3d 795, 803 (Fed. Cir. 1999))).

E. Challenge based on Lack of Written Description of Claim 1

Petitioner contends claims 1–13 are invalid because they lack written description under 35 U.S.C. § 112(a). Pet. 23–37, 82–85.

1. Petitioner’s Initial Contentions

Petitioner contends limitation 1.1 of claim 1 of the ’274 patent, which recites “determining a neighboring intra prediction mode associated with a neighboring block, the neighboring block being adjacent to a current block,” has no written description support in the ’928 application. Pet. 23–37.¹⁰

¹⁰ The relevant issue as to written description is whether claim 1 of the ’274 patent has written description support in the ’086 application. However, because the specifications of the ’086 application and the ’928 application are the same (due to the fact the priority chain includes continuation

Instead, Petitioner contends that the '928 application describes, “at best, . . . an exploratory process by which multiple intra modes for the current block are evaluated based on different candidate directionalities for pixel pairs in neighboring blocks,” but “does not determine, or conclusively establish, the intra prediction mode of the neighboring block—[the process] has no need to and does not use this information.” *Id.* at 20, 25 (citing Ex. 1005 ¶¶ 75–83) (emphasis omitted); *see id.* at 25 (citing Ex. 1029, 27:11–13 (deposition testimony of Patent Owner’s expert, Dr. Reader, in the ’702IPR); Ex. 1005 ¶ 83; Ex. 1021 ¶¶ 62–67). According to Petitioner, “it is sufficient for purposes of the ’928 application to identify that the current block is similar enough to the pixels surrounding it.” *Id.* at 25–26; *see id.* at 26 (citing Ex. 1005 ¶¶ 84–90; Ex. 1021 ¶¶ 62–68).

Petitioner contends that “Figures 7A–7H and 8 of the ’928 application, the method described in the ’928 application examines pixel pairs in multiple different neighboring blocks to determine the intra prediction mode of the current block, and does not rely on any single neighboring block.” *Id.* at 26. Petitioner further contends that “the ’928 application’s method **does not establish or determine** what the intra prediction mode of the neighboring block is for purposes of determining the intra prediction mode of the current block—if it did, it would not calculate the cost value ‘for each of the intra modes.’” *Id.* at 29 (citing Ex. 1005 ¶¶ 75–84; Ex. 1021 ¶¶ 69–72). “The ’928 application could, or would, result in a much simpler process, relying on a singular determined intra prediction mode for the neighboring block,” but “[t]his is not what is disclosed.” *Id.*

applications), Petitioner’s argument regarding the lack of support in the ’928 application arrives at the same conclusion.

According to Petitioner, “[t]he ’928 application’s process is a brute-force method of determining an intra prediction mode for the current block, which always tries 9 scenarios, and selects one scenario.” *Id.* at 30 (citing Ex. 1005 ¶ 92; Ex. 1016 ¶ 89).

In affirming the Board’s Final Written Decision issued in connection with the ’702IPR, the Federal Circuit held that

the Board’s finding that the portions of the ’849 patent specification that [Patent Owner] Ideahub identified in its motion to amend and subsequent revised motion to amend did not provide written description support for “determining an intra mode for a neighboring block of a current block” is supported by substantial evidence, including expert testimony explaining the cited portions of the ’849 specification. We therefore affirm the Board’s denial of [Patent Owner] Ideahub’s revised motion to amend as well.

Ex. 1044, 2.

As discussed above in Section III.C.2, Patent Owner is collaterally estopped from making arguments that are contrary or inconsistent with the conclusion reached in the prior action, the ’702IPR. Petitioner contends that, with respect to the ’702IPR, that we “previously found that the Specification of the ’240 Application, which matured into the ’849 Patent *and which is identically found in the disclosure of the ’274 Patent*, did not provide adequate written description support for the first limitation of the ’849 Patent: ‘determining an intra mode of a neighboring block.’” Pet. 82 (citing Ex. 1008, 36–50; Ex. 1032 (redline comparison of the ’086 application and the ’240 application)) (emphasis added). Accordingly, we conclude that substantively identical limitation 1.1 of claim 1 of the ’274 patent lacks written description support in the Specification of the ’274 patent, or any other patent or application in its priority chain.

2. *Summary*

Based on the complete record developed during trial and for the foregoing reasons, Petitioner establishes, by a preponderance of the evidence, that independent claim 1 lacks written description support in the '274 patent, '086 application, and any other patent or application in the priority chain of the '274 patent. *See* Pet. 36–37.

Petitioner argues that corresponding limitations in independent claims 7 and 13 are not supported by the written description of the '274 patent. Pet. 83–85. For the same reasons discussed with respect to independent claim 1, we conclude that Petitioner establishes, by a preponderance of the evidence, that independent claims 7 and 13 lack written description support in the '274 patent, '086 application, and any other patent or application in the priority chain of the '274 patent.

Petitioner also argues that claims 2–6 and 8–12 lack written description support by virtue of their dependencies from independent claims 1 and 7. *Id.* For the same reasons discussed with respect to independent claim 1, we conclude that Petitioner establishes, by a preponderance of the evidence, that dependent claims 2–6 and 8–12 lack written description support in the '274 patent, '086 application, and any other patent or application in the priority chain of the '274 patent.

F. Anticipation and Obviousness Challenges Based on HEVC265

Petitioner contends that claims 1–4 and 6 are anticipated by, or alternatively, rendered obvious in view of HEVC265. Pet. 44–52.

Patent Owner argues that HEVC265 is not prior art because it was published in 2013, which is after the December 23, 2010 filing date of the '928 application. PO Resp. 47. As we discuss above in Sections III.C.2 and

III.E, claims 1–13 of the '274 patent lack written description support in the '928 application, or any other application the priority chain of the '274 patent. Accordingly, Patent Owner's argument is unavailing. Patent Owner does not present substantive arguments with respect to the grounds applying HEVC265.

As we determine that claims 1–13 are unpatentable under 35 U.S.C. § 112(a) for lacking written descriptions support (*supra* §§ IIE.C.2, III.E), we need not specifically determine whether claims 1–4 and 6 are anticipated by HEVC265 or whether claims 1–4 and 6 are obvious in view of HEVC265. *See Bos. Sci. Scimed, Inc. v. Cook Grp. Inc.*, 809 F. App'x 984, 990 (Fed. Cir. 2020) (stating that the “Board need not address issues that are not necessary to the resolution of the proceeding,” such as “alternative arguments with respect to claims [the Board] found unpatentable on other grounds”); *see also Beloit Corp. v. Valmet Oy*, 742 F.2d 1421, 1423 (Fed. Cir. 1984) (holding that once a dispositive issue is decided, there is no need to decide other issues).

IV. CONCLUSION¹¹

In summary,

¹¹ Should Patent Owner wish to pursue amendment of the challenged claims in a reissue or reexamination proceeding subsequent to the issuance of this decision, we draw Patent Owner's attention to the April 2019 *Notice Regarding Options for Amendments by Patent Owner Through Reissue or Reexamination During a Pending AIA Trial Proceeding*. *See* 84 Fed. Reg. 16,654 (Apr. 22, 2019). If Patent Owner chooses to file a reissue application or a request for reexamination of the challenged patent, we remind Patent Owner of its continuing obligation to notify the Board of any such related matters in updated mandatory notices. *See* 37 C.F.R. § 42.8(a)(3), (b)(2).

Claims Challenged	35 U.S.C. §	Reference(s)/ Basis	Claims Shown Unpatentable	Claims Not Shown Unpatentable
1–4, 6	102	HEVC265 ¹²		
1–4, 6	103	HEVC265 ¹³		
1–13	112(a)	Lack of written description	1–13	
Overall Outcome			1–13	

V. ORDER

For the reasons given, it is:

ORDERED that Petitioner has established based on a preponderance of evidence that claims 1–13 of the '274 patent are unpatentable; and

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

¹² Because we determined that the challenged claims are unpatentable under 35 U.S.C. § 112(a), we decline to address this ground.

¹³ Because we determined that the challenged claims are unpatentable under 35 U.S.C. § 112(a), we decline to address this ground.

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