

UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE PATENT TRIAL AND APPEAL BOARD

UNIFIED PATENTS INC.,
Petitioner,

v.

VELOS MEDIA, LLC,
Patent Owner.

IPR2019-00194
Patent 9,338,449 B2

Before J. JOHN LEE, JASON W. MELVIN, and AARON W. MOORE,
Administrative Patent Judges.

MELVIN, *Administrative Patent Judge.*

JUDGMENT
Final Written Decision
Determining No Challenged Claims Unpatentable
35 U.S.C. § 318(a)

I. INTRODUCTION

Petitioner, Unified Patents, Inc., filed a Petition (Paper 1, “Pet.”) requesting *inter partes* review of claims 1–3, 5, 13–15, and 17 (“the challenged claims”) of U.S. Patent No. 9,338,449 B2 (Ex. 1001, “the ’449 patent”). Patent Owner, Velos Media, LLC, filed a Preliminary Response. Paper 7 (“Prelim. Resp.”). We instituted review of the challenged claims. Paper 8 (“Institution Decision” or “Inst.”).

Patent Owner filed a Response. Paper 27 (“PO Resp.”). Petitioner filed a Reply. Paper 37 (“Pet. Reply”). Patent Owner filed a Sur-Reply. Paper 47 (“PO Sur-Reply”). Petitioner filed a Sur-Sur-Reply. Paper 48 (“Pet. Sur-Sur-Reply”). We held a hearing on February 13, 2020, and a transcript appears in the record. Paper 54 (nonconfidential portion) (“Tr.”); Paper 56 (confidential portion).

This is a final written decision as to the patentability of the challenged claims. For the reasons discussed below, we determine that Petitioner has not shown by a preponderance of the evidence that any of the challenged claims is unpatentable.

A. THE ’449 PATENT

The ’449 patent is titled “Harmonized Scan Order for Coding Transform Coefficients in Video Coding” and describes techniques related to processing video-compression data. Ex. 1001, code (54), 1:16–2:17. The patent describes that video compression involves processing blocks of image data with spatial or temporal prediction to generate blocks of residual data that represent pixel-level differences between the original block and the predictive block. *Id.* at 1:35–55. Further processing transforms the data into a transform domain and quantizes the data, thus producing blocks of

quantized residual transform coefficients. *Id.* at 1:55–58. The two-dimensional blocks of transform coefficients may be scanned to produce a one-dimensional vector of transform coefficients suitable for entropy coding. *Id.* at 1:58–62. The patent explains that, “[t]o entropy code a block of quantized transform coefficients, a scanning process is usually performed so that the two-dimensional (2D) array of quantized transform coefficients in a block is processed, according to a particular scan order, in an ordered, one-dimensional (1D) array, i.e., vector, of transform coefficients.” *Id.* at 5:51–56.

The ’449 patent states that “scan order may be important for efficient entropy coding.” *Id.* at 6:5–6. It purports to improve the scanning process by selecting the order for scanning a block of transform coefficients during each of multiple passes. *Id.* at 2:12–51. In the video-compression standards discussed, the transform coefficients are first scanned to determine the location of significant (nonzero) coefficients, creating a significance map identifying such locations. *Id.* at 7:28–8:31. Then, the level of each significant coefficient is scanned and coded. *Id.* at 8:31–34. The ’449 patent states that conventional coding processes disadvantageously used different scan orders for coding the significance map and coding the coefficient levels. *Id.* at 10:11–44. The ’449 patent proposes approaches that address the drawbacks with conventional coding processes. *Id.* at 10:65–11:1. One proposed approach is scanning the transform coefficients in the same order for significance coding and level coding. *Id.* at 13:47–55, 16:36–56. The challenged claims reflect that approach, as set forth below.

B. ILLUSTRATIVE CLAIMS

Challenged claims 1 and 13 are independent. Claim 1 is illustrative and is reproduced below:

1. A method of coding a plurality of transform coefficients associated with residual video data in a video coding process, the method comprising:
coding information indicating significant coefficients for the plurality of transform coefficients according to a scan order in a first scan pass, wherein the scan order includes a scan pattern and a scan direction; and
coding information indicating levels of significant coefficients of the plurality of transform coefficients according to the scan order used for coding the information indicating significant coefficients in a second scan pass.

Id. at 39:45–55. Claim 13 recites parallel limitations, as instructions on a non-transitory computer-readable storage medium that cause a processor to perform the claimed method. *Id.* at 40:36–48.

C. PRIOR ART AND ASSERTED GROUNDS

Petitioner asserts that the challenged claims would have been unpatentable on the following grounds:

Claims Challenged	35 U.S.C. §	Reference(s)/Basis
1–3, 5, 13–15, 17	103	Cheon ¹ , Perera ²
1–3, 5, 13–15, 17	103	Perera

¹ U.S. Publication No. 2011/0096834 A1 (filed Oct. 28, 2010; published Apr. 28, 2011) (Ex. 1003).

² U.S. Publication No. 2008/0043833 A1 (published Feb. 21, 2008) (Ex. 1004).

Claims Challenged	35 U.S.C. §	Reference(s)/Basis
1–3, 5, 13–15, 17	103	Cheon, Mallat ³

Pet. 4. Petitioner also relies on the Declaration of Lina J. Karam, Ph.D. (Ex. 1002). *See generally* Pet. 4–79.

II. ANALYSIS

A. LEVEL OF ORDINARY SKILL IN THE ART

Petitioner asserts a person of ordinary skill in the art at the time of the application resulting in the '449 patent “would have had at least the equivalent of a Bachelor’s degree in electrical engineering, computer engineering, or a related subject and two or more years of experience in the field of video coding.” Pet. 23–24. Patent Owner does not contest that definition of a skilled artisan or offer a different one. Petitioner’s definition is consistent with the descriptions in the '449 patent and the asserted art, and we adopt it.

B. CLAIM CONSTRUCTION

In a Board proceeding based on a petition filed before November 13, 2018, as here, claims in an unexpired patent are interpreted according to their broadest-reasonable construction in light of the specification of the patent in which they appear. 37 C.F.R. § 42.100(b) (2018); *Cuozzo Speed Techs., LLC v. Lee*, 136 S. Ct. 2131, 2144–46 (2016).⁴ Under that standard,

³ Stéphane Mallat, *Analysis of Low Bit Rate Image Transform Coding*, IEEE Transactions on Signal Processing, Vol. 46, No. 4, April 1998, at 1027 (Ex. 1020).

⁴ A recent amendment to this rule does not apply here because the Petition was filed before November 13, 2018. *See* Changes to the Claim Construction Standard for Interpreting Claims in Trial Proceedings Before

we generally give a claim term its “ordinary and customary meaning,” which is “the meaning that the term would have to a person of ordinary skill in the art in question” at the time of the invention. *In re Translogic Tech., Inc.*, 504 F.3d 1249, 1257 (Fed. Cir. 2007). The specification may impose a specialized meaning, departing from the ordinary and customary meaning, by defining a term with reasonable clarity, deliberateness, and precision. *In re Paulsen*, 30 F.3d 1475, 1480 (Fed. Cir. 1994).

Although Petitioner proposes a construction for “information indicating levels of significant coefficients” (Pet. 27), we determined in the Institution Decision that there was no need to construe the phrase. Inst. 5. Absent any indication from the parties why such a construction would impact our analysis, we reach that same conclusion here. *See Nidec Motor Corp. v. Zhongshan Broad Ocean Motor Co.*, 868 F.3d 1013, 1017 (Fed. Cir. 2017); *Vivid Techs., Inc. v. Am. Sci. & Eng’g, Inc.*, 200 F.3d 795, 803 (Fed. Cir. 1999).

In the Institution Decision, we noted that applying the asserted grounds requires an understanding of whether the claimed “first scan pass” and “second scan pass” require scanning transform coefficients or instead encompass scanning an intermediate data set, itself created from the transform coefficients. Inst. 5. Based on our analysis of the record at that time, we construed the claims as limited to scanning the transform coefficients themselves and invited the parties to address the issue during trial. *Id.*

the Patent Trial and Appeal Board, 83 Fed. Reg. 51,340 (Oct. 11, 2018) (amending 37 C.F.R. § 42.100(b), effective Nov. 13, 2018) (codified at 37 C.F.R. § 42.100(b) (2019)).

Patent Owner submits that “the claims require scanning the transform coefficients in each scan pass.” PO Resp. 10. Patent Owner relies first on the claim language, which is directed to “coding ‘a plurality of transform coefficients’” by performing two scan passes. PO Sur-Reply 5–6. It also points out that the specification discloses that “scanning of the transform coefficients may involve two scans”—one “to form the significance map” and another that “codes the levels of the transform coefficients.” Ex. 1001, 16:36–44; PO Sur-Reply 6. Patent Owner further identifies that the specification discusses “scan orders for a block of transform coefficients.” PO Sur-Reply 6 (citing Ex. 1001, 16:57–59).

Petitioner argues that the specification allows for scanning different information in the two scan passes, including an intermediate data set created from the transform coefficients. Pet. Reply 2–3. It submits that once a significance map has been created from the transform coefficients, scanning that map itself would generate the claimed significance information, while scanning the transform coefficients would generate the claimed level information. *Id.* at 3. Thus, according to Petitioner, a “significance map scan” refers to scanning the significance map, not scanning the transform coefficients to generate the significance map. Stated otherwise, Petitioner reads the claimed coding process as producing an output stream of information, not as producing significance and level maps. *See* Tr. 25:22–26:20 (The claim “talks about the scans that are required for coding information, not for generating the significance map. It’s coding the information to be sent to the decoder.”).

The claim language is of primary importance. The claims recite “coding information indicating significant coefficients . . . according to a

scan order in a first scan pass,” allowing one possible understanding that the “first scan pass” frames the relevant “scan order.” Alternatively, the “first scan pass” frames the step of “coding information” (which would be performed “in a first scan pass”).

The claim’s subsequent limitation resolves the ambiguity regarding the phrase “in a first scan pass” and shows the proper grammatical relationship. That limitation recites “coding information indicating levels . . . according to the scan order used for coding the information indicating significant coefficients in a second scan pass.” The phrase “in a second scan pass” serves not to frame the scan order—the scan order for coding level information must be the same as the scan order for coding significance information. Rather, “in a second scan pass” relates to the phrase “coding information”—no other understanding of “in a second scan pass” would make sense. For internal consistency, that same understanding must apply to the first limitation such that “in a first scan pass” frames the step of “coding information.” Thus, the claim language requires coding significance information in a first scan pass, and then coding level information in a second scan pass, where each scan pass uses the same scan order.

With the understanding just discussed, it does not make sense to view the claims as applying to methods that scan data other than the transform coefficients. We reach that conclusion first because the claims recite “coding information . . . for the plurality of transform coefficients” and, thus, directly involve the transform coefficients. Second, as discussed, the acts of coding information must be performed in a first and second scan pass (using the same scan order for each). Because coding involves the transform coefficients and must be performed in the claimed scan passes, those two

aspects of the claim language require scanning the transform coefficients themselves.

Petitioner argues that construing the claim language as Patent Owner seeks would exclude a disclosed embodiment because the specification's statement that "a first scan is the significance map scan" indicates a scan *of* the significance map. Pet. Reply 5–6 (quoting Ex. 1001, 2:30–44). Therefore, according to Petitioner, the claimed first scan pass must include scanning data other than the transform coefficients. *Id.*

When discussing the scans in more detail, the specification states that "the significance map is encoded by following a scan order of transform coefficients in the block" and describes that the block of transform coefficients "are first mapped into a one-dimensional list using a given scanning pattern." Ex. 1001, 7:58–65. It then states that, "[g]iven the scanning pattern, the significance map is scanned" using a procedure where, "[f]or each transform coefficient in the scanning order, a one-bit symbol `significant_coeff_flag` is transmitted." *Id.* at 8:5–7. Although that language states that "the significance map is scanned," the overall discussion shows that a "significance map scan" refers to scanning the transform coefficients to generate the significance map. That understanding is consistent with a statement in the Background that "[t]he quantized transform coefficients, initially arranged in a two-dimensional array, may be scanned in a particular order to produce a one-dimensional vector of transform coefficients for entropy coding." *Id.* at 1:58–62. The specification repeatedly describes scanning as a process applied to the transform coefficients, for example to obtain a one-dimensional array from a two-dimensional block of coefficients. *See, e.g., id.* at 5:51–59, 7:61–65, Figs. 2, 3, 6. It is consistent

with the specification to interpret a “coding” process as one that operates on transform coefficients to produce a significance map or level information. *See id.* at 7:36–38 (“As shown in FIG. 1, significance map coding of the quantized transform coefficients 11 produces a significance map 13.”).

Based on the foregoing discussion, we conclude that the claimed scan passes require scanning the plurality of transform coefficients, not an intermediate data set.

C. UNPATENTABILITY BASED ON CHEON

Petitioner relies on Cheon as disclosing most of claim 1’s limitations in the ground asserting Cheon and Perera, and in the ground asserting Cheon and Mallat. Pet. 39–62, 70–71.

Cheon discloses image-compression techniques for encoding and decoding blocks of residual data. Ex. 1003 ¶¶ 3, 5, 210–216. Cheon’s coding process involves scanning blocks of residual data to produce a significance map. *Id.* ¶¶ 174–175, Figs. 14A–C. Cheon states that “[l]evel information of an effective coefficient, i.e., a sign and an absolute value of the effective coefficient, is encoded after the significance map is encoded.” *Id.* ¶ 175.

Petitioner asserts that Cheon discloses both claimed scan passes of the transform coefficients—one to generate significance information and one to generate level information. Pet. 41 (“Cheon further discloses generating, from transformation residual block 1420, a significance map 1430 shown in Figure 14C.”), 45 (“Cheon discloses that significance map 1430 is ‘encoded according to a raster scanning order, and scanning is performed from left to right and top to bottom.’” (quoting Ex. 1003 ¶ 175)), 61 (“[A] POSA would have understood that, after the significance map is encoded in a first scan pass, Cheon’s transformation residual block would be scanned in a second

pass to encode the information indicating or representative of sign and the absolute value of every effective coefficient” (citing Ex. 1002 ¶ 127)).

Indeed, when Patent Owner challenged whether Mallat discloses a second scan pass, Petitioner confirmed that it “relies on Cheon for multiple scan passes.” Pet. Reply 13 (citing Pet. 71).

We find Cheon’s disclosure regarding a purported second scan is insufficient to carry Petitioner’s burden. The primary disclosure Petitioner relies on states only that “[l]evel information of an effective coefficient . . . is encoded after the significance map is encoded.” Ex. 1003 ¶ 175. That does not expressly state that a second scan is performed to encode the level information. Petitioner is left relying on a statement by its declarant that a person of skill would have understood to perform a second scan pass when encoding the level information. Pet. 61. But Petitioner’s declarant provides no explanation and instead simply makes the conclusion. Ex. 1002 ¶ 127. We do not afford significant weight to such a conclusory statement. *See* 37 C.F.R. § 42.65(a) (“Expert testimony that does not disclose the underlying facts or data on which the opinion is based is entitled to little or no weight.”). We are left with the *possibility* that Cheon’s paragraph 175 discloses a second scan, but that does not persuade us that Cheon makes an adequate disclosure to teach a second scan. In this regard, we credit the testimony of Patent Owner’s declarant that skilled artisans would have understood Cheon’s paragraph 175 to teach a single scan pass. Ex. 2034 ¶¶ 158–159.

In the Reply, Petitioner identifies Cheon’s paragraph 198 as supporting that Cheon discloses two scan passes. Pet. Reply 10–11. That paragraph describes operation of the “effective coefficient encoder 1530” in

connection with Figure 17A. Ex. 1003 ¶ 198. The encoder “may encode a significance map indicating locations of effective transformation coefficients . . . , and size and sign information of each effective transformation coefficient, while scanning the entire transformation residual block.” *Id.* According to Petitioner, the “scan to capture integers is a second scan pass, different from the significance map scan capturing binary data.”

Pet. Reply 11.⁵

Patent Owner contends that Cheon’s paragraph 198 instead shows a process of performing a single scan to encode both significance and level information. PO Sur-Reply 14–15. In support of that conclusion, Patent Owner relies on Cheon’s statement that both types of information may be encoded “while scanning.” *Id.*

Paragraph 198 further states that “scanning may be skipped in a frequency band unit in which an effective coefficient flag has a value of 0, i.e., a frequency band unit that does not have an effective transformation coefficient.” *Id.* Petitioner argues that knowing a scan may be skipped requires an initial scan for significance information. Tr. 61:17–62:9. We agree with Patent Owner that this is a new argument that was raised for the first time at the oral hearing. Tr. 66:7–9. Even considering it, however, the argument is not persuasive on its merits.

Petitioner’s argument glosses over Cheon’s disclosure that scanning may be skipped for units “in which an effective coefficient *flag* has a value of 0.” Ex. 1003 ¶ 198 (emphasis added). Cheon explains that flag in paragraph 194, stating that “the effective coefficient flag generator 1520

⁵ Petitioner uses “integers” to refer to the claimed level information. Reply 10.

generates an effective coefficient flag indicating whether an effective transformation coefficient exists in each frequency band unit” when splitting a residual block into frequency band units. *Id.* ¶ 194. Consistently, as Patent Owner points out, Cheon’s figure 15 shows that generating flags is a separate operation from encoding the effective coefficients. Tr. 66:11–20; Ex. 1003, Fig. 15. Thus, we do not agree with Petitioner that knowing whether scanning may be skipped for a frequency band unit teaches scanning that unit to code significance information, as claimed.

Petitioner further relies on Cheon’s paragraph 215 as disclosing two transform-coefficient scans. Pet. 52; Tr. 61:5–7. There, Cheon describes a step of Figure 20, which shows one “method of encoding a residual block.” *See* Ex. 1003 ¶¶ 30, 215, Fig. 20. According to paragraph 215, “the effective coefficient encoder 1530 encodes a significance map indicating locations of the effective transformation coefficients and level information of the effective transformation coefficients . . . while scanning the transformation residual block.” *Id.* ¶ 215. Thus, paragraph 215 describes the same encoder as does paragraph 198. The described operation matches that in paragraph 198, discussed above. For the same reasons discussed above regarding paragraph 198, we find that Cheon’s paragraph 215 does not teach two separate scans for encoding significance and level information of the transformation coefficients.

Accordingly, Cheon does not teach two scan passes that encode transform-coefficient significance and level information, respectively. Petitioner relies on Cheon alone to satisfy the claims’ requirement for two scan passes (*see* Pet. Reply 13), and we, therefore, conclude that, for the two grounds including Cheon, Petitioner has not shown unpatentability by a

preponderance of the evidence. Petitioner’s assertions for claim 13 rely on its assertions for claim 1, and, therefore, suffer from the same deficiencies. Pet. 65–66. Petitioner’s assertions for the dependent claims do not remedy those deficiencies. *Id.* at 62–63, 66–67. Accordingly, we conclude that Petitioner has not proven unpatentability based on Cheon and Perera or based on Cheon and Mallat.

D. UNPATENTABILITY BASED ON PERERA

In the first ground, Petitioner asserts that Cheon teaches most limitations of claim 1 and that Perera teaches performing a scan “according to the scan order used for coding the information indicating significant coefficients.” Pet. 39–62. In the second ground, Petitioner asserts that Perera teaches all limitations. Pet. 67. We conclude that Petitioner has not adequately supported either ground because Perera does not disclose certain aspects of the claims.

1. Perera does not disclose coding significance information by scanning the transform coefficients

Perera relates to transferring data representing video images. Ex. 1004 ¶¶ 1, 2. Like the ’449 patent, Perera’s method involves separating the data into blocks of information and transforming those image-data blocks into transform-coefficient blocks. *Id.* at ¶¶ 4–6. For transmission, Perera discloses methods of encoding the transform blocks. *Id.* ¶¶ 7–8. Perera discloses that “each block [of coefficients] is scanned in a certain order to generate a series of data (a first data series 52).” Ex. 1004 ¶ 42. It also discloses that “the significance map 54 . . . indicates the location of non-zero values in the data series 52.” *Id.*

In the ground asserting Perera alone, Petitioner relies on its assertions regarding the combination of Cheon and Perera. Pet. 67. Those include that Perera teaches “coding information indicating significant coefficients for the plurality of transform coefficients according to a scan order in a first scan pass” as claimed. Pet. 43–45, 46–47. Notably, Petitioner relies on Perera’s disclosure of scanning transform coefficients to generate “data series 52” and then generating a significance map from that data series. *Id.* at 46–47 (citing Ex. 1004 ¶¶ 41, 42). In other words, Petitioner does not dispute that Perera teaches determining the significant coefficients by scanning an intermediate data set rather than by scanning the transform coefficients. *See* PO Sur-Reply 2–3.

As discussed above, we construe the challenged claims to require scanning the transform coefficients themselves, not an intermediate data set. *See supra* at 5–10. Perera teaches a different process, in which residual data is first scanned to produce a one-dimensional array and then that array is used to code information indicating the significant coefficients and the levels of those coefficients.

Thus, we do not agree with Petitioner that Perera teaches the claimed first scan pass. Accordingly, Petitioner has failed to prove claim 1’s unpatentability over Perera alone. Petitioner’s assertions for claim 13 rely on its assertions for claim 1, and, therefore, suffer from the same deficiencies. Pet. 67. Petitioner’s assertions for the dependent claims do not remedy those deficiencies. *Id.* Accordingly, we conclude that Petitioner has not proven unpatentability based on Perera alone.

2. *Perera does not disclose a scan order that would apply to Cheon*

When Petitioner asserts a combination of teachings from Cheon and Perera, it relies on Perera as teaching that the scan order of the second scan pass proceeds “according to the scan order used for coding the information indicating significant coefficients.” *See* Pet. 52–54. Petitioner relies on the *values* of Perera’s data series 52 being in the same order as the transform coefficients were scanned. *See* Pet. 53 (asserting that Perera “codes the levels of series 52 to form coefficients 58 in series 60 in the same scan order as the coding of block 50 to form series 52”), 54 (arguing that, to generate the values of significant coefficients, “series 52 (including significant coefficients) would have been scanned” in the same pattern as encoding of Perera’s significance map 54).

Because Perera discloses scanning a one-dimensional intermediate data set (data series 52), the order for that scan is not the same as the order for scanning a two-dimensional block of transform coefficients. The claim requires a “scan order [that] includes a scan pattern and a scan direction.” But Perera’s scan of a one-dimensional list does not provide a pattern that may be applied to Cheon’s two-dimensional array.

Thus, we do not agree with Petitioner that Perera teaches the claimed “according to the scan order used for coding the information indicating significant coefficients.” Accordingly, Petitioner has failed to prove claim 1’s unpatentability over a combination of Cheon and Perera for this additional reason.⁶ Petitioner’s assertions for claim 13 rely on its assertions for claim 1, and, therefore, suffer from the same deficiencies. Pet. 64–66.

⁶ As explained above, Petitioner also failed to meet its burden on this asserted ground due to deficiencies relating to Cheon’s teachings.

Petitioner's assertions for the dependent claims do not remedy those deficiencies. Pet. 62–64, 66–67. Accordingly, for that additional reason, we conclude that Petitioner has not proven unpatentability based on a combination of Cheon and Perera.

E. REAL PARTIES IN INTEREST

Patent Owner argues that we should dismiss the Petition because it does not name all real parties in interest. PO Resp. 65–69. Patent Owner identifies seven companies that have paid membership fees to Petitioner and asserts that those companies should have been named as real parties in interest. *Id.*

Petitioner challenges Patent Owner's assertions, arguing that Unified Patents Inc. is the sole real party in interest. Pet. Reply 22–30. Petitioner cites evidence that it alone controls this proceeding (Ex. 2018, 11; Ex. 1045, 31:25–33:2) and does not communicate with its members about potential validity challenges before filing IPRs (Ex. 1045, 222:14–223:4). Petitioner searched for and could not identify any communications with its members regarding the '449 patent or this proceeding other than public announcements. Pet. Reply 25; Ex. 2027, 68:22–69:9; Ex. 2019. Petitioner further points out that no alleged unnamed real party in interest would be subject to a time bar under § 315(b). Pet. Reply 25.

We have considered the parties submissions and determine that Petitioner has adequately identified the real party in interest. Patent Owner has introduced no evidence specific to this proceeding that causes us to question Petitioner's identification, and has not identified an aspect of Petitioner's business structure that we view as showing the alleged unnamed real parties in interest are clear beneficiaries with respect to this proceeding

that have a preexisting, established relationship with Petitioner. *See Ventex Co. v. Columbia Sportswear N. Am., Inc.*, IPR2017-00651, Paper 152, 6–11 (Jan. 24, 2019) (precedential).

F. THE BOARD’S CONSTITUTIONALITY

Patent Owner asserts that the “Board lacks the authority to issue a Final Written Decision in this proceeding because the Administrative Patent Judges (‘APJs’) are principal officers of the United States that must be appointed by the President and confirmed by the Senate.” PO Sur-Reply 25. According to Patent Owner, the Federal Circuit’s decision in *Arthrex, Inc. v. Smith & Nephew, Inc.*, 941 F.3d 1320 (Fed. Cir. 2019), “did not actually fix the problem.” PO Sur-Reply 25.

We, however, follow the Federal Circuit’s decision, which addressed this issue. *See Arthrex*, 941 F.3d at 1337 (“This as-applied severance . . . cures the constitutional violation.”). Accordingly, Patent Owner’s argument is not persuasive.

III. CONCLUSION

For the reasons discussed above, we conclude Petitioner has not proven unpatentability of the challenged claims.

In summary:

Claims	35 U.S.C. §	Reference(s)/Basis	Claims Shown Unpatentable	Claims Not Shown Unpatentable
1–3, 5, 13–15, 17	103	Cheon, Perera		1–3, 5, 13–15, 17
1–3, 5, 13–15, 17	103	Perera		1–3, 5, 13–15, 17
1–3, 5, 13–15, 17	103	Cheon, Mallat		1–3, 5, 13–15, 17
Overall Outcome				1–3, 5, 13–15, 17

IV. ORDER

In consideration of the foregoing, it is hereby:

ORDERED that claims 1–3, 5, 13–15, and 17 of US 9,338,449 B2 are not determined to be unpatentable; and

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

IPR2019-00194
Patent 9,338,449 B2

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