

UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE PATENT TRIAL AND APPEAL BOARD

PELOTON INTERACTIVE, INC.,
Petitioner,

v.

NEC CORPORATION,
Patent Owner.

IPR2023-01239
Patent 8,752,101 B2

Before MICHAEL J. STRAUSS, CHARLES J. BOUDREAU, and
CHRISTOPHER L. OGDEN, *Administrative Patent Judges*.

STRAUSS, *Administrative Patent Judge*.

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

I. INTRODUCTION

Petitioner Peloton Interactive, Inc. (“Petitioner”) filed a Petition (Paper 2, “Peloton IPR”) under 35 U.S.C. §§ 311–319 requesting *inter partes* review (“IPR”) of claims 1, 2, 4, 5, 7, 11, 12, 14–18, 20–23, and 25–29 of U.S. Patent No. 8,752,101 (Ex. 1001, “the ’101 patent”). In support of the Petition, Petitioner filed confidential sealed and redacted public versions of a declaration of Dr. Clifford Reader (Exhibits 1006 and 1037, respectively). With the Board’s authorization, Petitioner filed a Motion to Correct Petition Under 37 C.F.R. § 42.104(c), seeking to “correct certain clerical errors in the Petition and [both versions of] the [Reader] declaration” (Paper 11), which Patent Owner opposed (Paper 12). The Board granted Petitioner’s motion (*see* Paper 13, Order Granting Motion to Correct Clerical or Typographical Mistakes), and Petitioner filed a Revised Petition (Paper 15, hereinafter, “Petition” or “Pet.”) and revised confidential and public versions of the Reader declaration (reusing Exhibit numbers 1006 and 1037, respectively). Patent Owner NEC Corporation (“Patent Owner”) filed a Preliminary Response (Paper 14, “Prelim. Resp.”). In support of the Preliminary Response, Patent Owner filed a declaration of Dr. Dan Schonfeld (Exhibit 2001).

We have authority to determine whether to institute an *inter partes* review. 35 U.S.C. § 314(b) (2018); 37 C.F.R. § 42.4(a) (2023). Under 35 U.S.C. § 314(a), an *inter partes* review may not be instituted unless the information presented in the Petition and any response thereto shows “there is a reasonable likelihood that the petitioner would prevail with respect to at least 1 of the claims challenged in the petition.”

Upon consideration of the arguments and evidence presented, we determine that Petitioner has demonstrated a reasonable likelihood of prevailing with respect to at least one challenged claim, and accordingly, we institute an *inter partes* review as to all challenged claims of the '101 patent on the grounds of unpatentability presented. *See* 37 C.F.R. § 42.108(a) (“When instituting . . . review, the Board will authorize the review to proceed on all of the challenged claims and on all grounds of unpatentability asserted for each claim.”).

II. BACKGROUND

A. *Real Parties in Interest*

Petitioner and Patent Owner identify themselves as the real parties in interest in this proceeding. Pet. 3; Paper 6, 2 (Patent Owner Mandatory Notices). These identifications are not challenged on the preliminary record before us.

B. *Related Matters*

The parties identify as related matters involving the '101 patent *NEC Corp. v. Peloton Interactive, Inc.*, No. 1:22-cv-00987 (D. Del.) (the “Related Litigation”); *NEC Corp. v. Our Body Electric Inc.*, No. 1:22-cv-00986 (D. Del.); and *NEC Corp v. Tone It Up Inc.*, No. 1:22-cv-00988 (D. Del.). Pet. 4, Paper 6, 2.

C. *The '101 Patent*

The '101 patent, titled “Distribution System,” issued June 10, 2014, from U.S. Patent Application No. 13/508,025 (“the '025 application”), filed May 3, 2012. Ex. 1001, codes (21), (22), (45), (54). The '025 application was filed as International Application No. PCT/JP2010/006067 on October

13, 2010. *Id.* at codes (22), (86). The '101 patent claims priority to Japanese Patent Application No. 2009-253581, filed November 5, 2009. *Id.* at code (30).

In a first Office Action (Ex. 1002, 35–38) the Examiner rejected only computer-readable storage medium claims 21 and 26 under 35 U.S.C. § 101 as directed to non-statutory subject matter, i.e., including a signal per se. *Id.* at 36–37. Claims 1–20, 22–25, and 27–29 were allowed. *Id.* at 37. Although neither discussing nor rejecting any claims based on the prior art, the Examiner cited several U.S. patent publications on a form PTO-892 that accompanied the Office Action, including U.S. Patent No. 6,370,688 (Hejna). *Id.* at 39. Rejected claims 21 and 26 were subsequently allowed in response to applicant's Amendment Under 37 C.F.R. § 1.111 limiting the claims to a non-transitory form of computer-readable storage medium. *Id.* at 8, 12–15, 22, 27–29. The Examiner's stated reasons for allowance referred to independent claims 28 and 29 in identifying respective combinations of elements which "the prior art of record fails to anticipate or render obvious." *Id.* at 13–14. The '101 patent subsequently issued on June 10, 2014, including claims 1–29. Ex. 1001, code (45), 28–31

As technical background, a number of different approaches had been employed to provide content to consumers over a communications network such as the Internet. Paper 14, 3–4; Paper 15, 18. As an alternative to requiring the entirety of a content file to be completely downloaded to a device prior to start of reproduction of the content (i.e., "download-first-and-then play"), systems including coding standards and streaming protocols were developed to stream content to users so that content is reproduced as the content file is being transferred. Paper 14, 4; Paper 15, 18. Streaming

systems encode and packetize content (e.g., audio and video) and use a communication network such as the Internet to deliver the encoded content to a user device that plays the content (e.g., reproduces the encoded audio and/or video content) as packets of content data are received and decoded. *Id.*

According to the parties, a problem with streaming systems is caused by, among other things, changing network conditions including bandwidth and transmission medium degradations. Paper 14, 5–6; Paper 15, 20. Systems attempt to mitigate problems caused by communication degradations and/or interruptions by buffering content at the user device and controlling the transmission or code rate of content data based on changing network conditions (i.e., adaptive (bitrate) streaming). Paper 14, 7; Paper 15, 20. “In this approach, the video content [is] encoded at multiple bitrates and the encoded video stream [is] divided into multiple smaller segments, just like progressive video. Individual video segments at various bitrates [are] selected by the receiver based on the network and buffer conditions and transmitted by the server to the receiver.” Paper 14, 6 (citing Ex. 2001 ¶ 31; Ex. 2007, 174 (James F. Kurose & Keith W. Ross, *Computer Networking* (7th ed. 2017)¹); *see also* Paper 15, 20.

The ’101 patent relates generally to a content (e.g., video, audio) distribution system that transmits content data encoded with a certain code rate to a reception device that, while receiving the content data, both stores the received data and reproduces the content. Ex. 1001, code (57). “The code

¹ Citations to Exhibit 2007 refer to the page numbers added by Patent Owner in the lower right corner of the pages of the exhibit rather than to the original page numbers of the referenced book.

rate represents the data amount (the data size, e.g., the number of bytes) of content data for reproducing content at constant speed (reproducing content at 1x speed) for a unit time (e.g., one second).” *Id.* at 7:8–11. It is understood that providing a higher code rate (i.e., using more data or bits to encode a given time period of content) enables a higher quality of content reproduction than does a lower code rate. The invention purportedly addresses a problem wherein, due to variations in communication speed (e.g., during periods of reduced communication speeds), a higher code rate (i.e., requiring more data to reproduce a given duration of content) can cause a reproduction device to be unable to start reproducing content at a set reproduction time. *Id.* at 1:54–64, 2:23–25. More particularly, a content distribution system and corresponding method include “a transmission device and a reception device configured to be capable of communicating with each other.” *Id.* at 2:26–29.

The transmission device is equipped with a content transmitting means for transmitting content data, which is one content coded with any one code rate of a plurality of code rates different from each other, to the reception device. The reception device is equipped with a content reproducing means for, while receiving the content data transmitted by the transmission device, storing received data of the content data into a storage device and also reproducing the content based on the stored data. The distribution system comprises a code rate determining means for determining the code rate based on a remaining time before reproduction start time set as time at which the reception device starts reproduction of the content from a present moment, and based on an available reproduction time, which is a time available for reproducing the content based on the content data stored in the storage device of the reception device. The content transmitting means is configured to change the code rate of the content data to

be transmitted to the reception device to the determined code rate.

Id. at 2:30–49.

D. Illustrative Claim

Of the challenged claims, claims 1, 11, 16, 21, 22, and 26–29 are independent claims. Claim 1, reproduced below with bracketed element identifiers corresponding to those used in the Petition,² is illustrative of the challenged claims.

[1a] A distribution system, including a transmission device and a reception device configured to be capable of communicating with each other,

[1b][i] the transmission device being equipped with a content transmitting unit for transmitting content data, which is [ii] one content coded with any one code rate of a plurality of code rates different from each other, to the reception device, and

[1c] the reception device being equipped with a content reproducing unit for, while receiving the content data transmitted by the transmission device, storing received data of the content data into a storage device and also reproducing the content based on the stored data,

[1d][i] the distribution system, comprising a code rate determining unit for determining the code rate [ii] based on a remaining time before reproduction start time set as time at which the reception device starts reproduction of the content from a present moment [iii] and based on an available reproduction time, which is a time available for

² To avoid confusion, rather than adopting the Petition’s convention of using lower case letters to label both major claim limitations (i.e., claim elements) and their subparts (i.e., constituent sub-elements), we use lower case Roman numerals to label the limitation’s subparts.

reproducing the content based on the content data stored in the storage device of the reception device, wherein:

[1e] the content transmitting unit is configured to change the code rate of the content data to be transmitted to the reception device to the determined code rate; and

[1f] the content reproducing unit is configured to start reproduction of the content at the set reproduction start time.

Ex. 1001, 24:38–63.

E. Asserted Grounds of Unpatentability

Petitioner asserts that the challenged claims are unpatentable on the following grounds:

Claims Challenged	35 U.S.C. § ³	Reference(s)/Basis
1, 2, 4, 5, 7, 11, 12, 14–18, 20–23, 25–29	103(a)	Chou ⁴
1, 2, 4, 5, 7, 11, 12, 14–18, 20–23, 25–29	103(a)	Chou, Wang ⁵
5, 7, 15	103(a)	Chou, Nobuyoshi ⁶

³ The Leahy-Smith America Invents Act, Pub. L. No. 112-29, 125 Stat. 284 (2011) (“AIA”), amended 35 U.S.C. § 103, effective March 16, 2013. Because U.S. Application No. 13/508,025 from which the ’101 patent issued was filed on May 3, 2012, which is before the effective date of the AIA, the pre-AIA versions of §§ 102 and 103 apply. *See* Ex. 1001, codes (21), (22), (30), (86), (87).

⁴ Chou et al., US 2006/0143678 A1, published June 29, 2006, filed December 10, 2004 (Ex. 1004, “Chou”).

⁵ Wang et al., US 7,606,928 B2, issued October 20, 2009, filed March 21, 2003 (Ex. 1006, “Wang”).

⁶ Certified English-language translation of Japanese Laid-Open Application 2007-13705, published January 18, 2007 (Ex. 1014, “Nobuyoshi”).

Pet. 6. Petitioner asserts that all references are prior art under pre-AIA 35 U.S.C. §§ 102(a) and 102(b). Pet. 7, 10, 13.

III. ANALYSIS

A. *Legal Standards*

“In an [*inter partes* review], the petitioner has the burden from the onset to show with particularity why the patent it challenges is unpatentable.” *Harmonic Inc. v. Avid Tech., Inc.*, 815 F.3d 1356, 1363 (Fed. Cir. 2016) (citing 35 U.S.C. § 312(a)(3) (2012) (requiring *inter partes* review petitions to identify “with particularity . . . the evidence that supports the grounds for the challenge to each claim”)). Except in limited circumstances not present here, this burden of persuasion never shifts to the patent owner. *See Dynamic Drinkware, LLC v. Nat’l Graphics, Inc.*, 800 F.3d 1375, 1378 (Fed. Cir. 2015) (discussing the burden of proof in *inter partes* review).

A patent claim is unpatentable for obviousness 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.” Pre-AIA 35 U.S.C. § 103(a).⁷

The ultimate determination of obviousness is a question of law, but that determination is based on underlying factual findings. The underlying factual findings include (1) “the scope and content of the prior art,” (2) “differences between the prior art and the claims at issue,” (3) “the level of ordinary skill in the pertinent art,” and (4) the presence of secondary considerations

⁷ *See supra* note 3.

of nonobviousness such “as commercial success, long felt but unsolved needs, failure of others,” and unexpected results.
In re NuVasive, Inc., 842 F.3d 1376, 1381 (Fed. Cir. 2016) (citation omitted) (quoting *Graham v. John Deere Co.*, 383 U.S. 1, 17–18 (1966)).

“To satisfy its burden of proving obviousness, a petitioner cannot employ mere conclusory statements. The petitioner must instead articulate specific reasoning, based on evidence of record, to support the legal conclusion of obviousness.” *In re Magnum Oil Tools Int’l, Ltd.*, 829 F.3d 1364, 1380 (Fed. Cir. 2016). Furthermore, in assessing the prior art, the Board must consider whether a person of ordinary skill would have been motivated to combine the prior art to achieve the claimed invention.
NuVasive, 842 F.3d at 1381 (citing *In re Warsaw Orthopedic, Inc.*, 832 F.3d 1327, 1333 (Fed. Cir. 2016)).

As the Supreme Court has held, “because inventions in most, if not all, instances rely upon building blocks long since uncovered, and claimed discoveries almost of necessity will be combinations of what, in some sense, is already known,” “it can be important to identify a reason that would have prompted a person of ordinary skill in the relevant field to combine the elements in the way the claimed new invention does.” *KSR Int’l Co. v. Teleflex Inc.*, 550 U.S. 398, 418–19 (2007).

B. Level of Ordinary Skill in the Art

Factors pertinent to a determination of the level of ordinary skill in the art include: (1) educational level of the inventor; (2) type of problems encountered in the art; (3) prior art solutions to those problems; (4) rapidity with which innovations are made; (5) sophistication of the technology; and (6) educational level of workers active in the field. *Envtl. Designs, Ltd. v.*

Union Oil Co., 713 F.2d 693, 696–697 (Fed. Cir. 1983) (citing *Orthopedic Equip. Co. v. All Orthopedic Appliances, Inc.*, 707 F.2d 1376, 1381–82 (Fed. Cir. 1983)). Not all such factors may be present in every case, and one or more of these or other factors may predominate in a particular case. *Id.* Moreover, these factors are not exhaustive but are merely a guide to determining the level of ordinary skill in the art. *Daiichi Sankyo Co. Ltd, Inc. v. Apotex, Inc.*, 501 F.3d 1254, 1256 (Fed. Cir. 2007).

In determining a level of ordinary skill, we also may look to the prior art, which may reflect an appropriate skill level. *Okajima v. Bourdeau*, 261 F.3d 1350, 1355 (Fed. Cir. 2001). Additionally, the Supreme Court informs us that “[a] person of ordinary skill is also a person of ordinary creativity, not an automaton.” *KSR*, 550 U.S. at 421.

Petitioner, supported by the testimony of Dr. Reader, argues that a person of ordinary skill in the art (“POSITA”) “would have a bachelor’s degree, or equivalent, in electrical engineering, computer science, a related field, and 2–3 years’ experience researching, designing, or developing content delivery systems and related hardware, software, and firmware, or equivalent experience.” Pet. 14 (citing Ex. 1006 ¶¶ 67–69). Petitioner further argues “[o]ne having less education but more practical experience, or more education and less experience, might also meet this standard.” *Id.* Patent Owner does not dispute nor offer an alternative level or skill in the art at this time. Prelim. Resp. 10 (citing Ex. 2001). Instead, “[f]or the purposes of this Patent Owner Preliminary Response only, Patent Owner applies Petitioner’s definition of POSITA.” *Id.*

Thus, on this record, the parties agree upon the proposed level of ordinary skill in the art, and this level is consistent with our review and

understanding of the technology and descriptions in the '101 patent and the prior art references that disclose content delivery systems. For purposes of this Decision, we rely on Petitioner's proposed level of ordinary skill in the art.

C. Claim Construction

We interpret claim terms

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. § 42.100(b).

At this stage in the proceeding, we expressly construe the claims only to the extent necessary to determine whether to institute *inter partes* review. *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))).

In the claim construction section of the Petition, Petitioner states that it “interprets the Challenged Claims according to *Phillips*,” giving “all terms . . . their plain and ordinary meaning.” Pet. 17. Nonetheless, Petitioner further argues, even if deemed to be means-plus-function limitations, the prior art teaches (i) the “content transmitting unit” of claim 1’s limitation [1b] (*id.* at 29–30); (ii) the “content reproducing unit” of limitation [1c] (*id.*

at 32–33); and (iii) and the “code rate determining unit” of limitation [1d] (*id.* at 40).

In its Preliminary Response, Patent Owner argues that, based on claim construction urged by Petitioner in the Related Litigation, Petitioner should have likewise construed the terms “content transmitting unit” (limitation [1b]) and “code rate determining unit” (limitation [1d]) as means-plus-function limitations in this proceeding. Prelim. Resp. 10–12. In connection with claims 27–29, Patent Owner further argues the use of the term “means” gives rise to a presumption of the corresponding limitations being subject to construction under 35 U.S.C. § 112 ¶ 6 (*id.* at 13). However, in connection with claim 1, Patent Owner does not otherwise include substantive argument and reasoning for construing the specified limitations of claim 1 as means-plus-function limitations other than based on Petitioner’s proposed construction in the Related Litigation. Instead, the thrust of Patent Owner’s argument is directed to its assertion that we should discretionarily deny *inter partes* review under 37 C.F.R. § 42.104(b)(3)–(4) discussed below, rather than how the claim language should be interpreted. *Id.* Moreover, Patent Owner’s arguments challenging Petitioner’s application of prior art references to the claims are not based on express interpretations of claim language. Therefore, on the current record and in the absence of persuasive substantive argument addressing claim construction, we determine that no claim term requires an express construction for the purpose of determining whether to institute *inter partes* review.

D. Discretionary Denial

1. *Errors and Lack of Due Attention*

Under 35 U.S.C. § 314(a), the Director has discretion to deny institution of an *inter partes* review. *Cuozzo Speed Techs., LLC v. Lee*, 136 S. Ct. 2131, 2140 (2016) (“[T]he agency’s decision to deny a petition is a matter committed to the Patent Office’s discretion.”). Relying on this discretionary authority, Patent Owner argues that the Board should exercise discretion under 35 U.S.C. § 314(a) and deny institution in view of the Peloton IPR, initially contending that “Petitioner did not give [the Petition] due attention” and because “[t]he Petition is fraught with errors and mistakes, both trivial and substantive.” Prelim. Resp. 1.

We are not persuaded it would be appropriate to deny institution merely on the basis of alleged trivial errors such as those identified by Patent Owner. *See* Prelim Resp. 1. To the extent Petitioner “cit[ed] the wrong Wang reference” (*id.*), this error was addressed in and corrected pursuant to our November 29, 2023, Order Granting Motion to Correct Clerical or Typographical Mistakes (Paper 13), entered prior to Patent Owner’s filing of the Preliminary Response, with Petitioner subsequently filing a corrected Petition and Declaration of Clifford Reader, Ph.D. Moreover, Patent Owner does not cite to any authority in support of discretionary denial of institution based on findings that a petitioner has not given a petition “due attention.” *Cf.* USPTO Notice of Proposed Rule Making “Changes Under Consideration to Discretionary Institution Practices, Petition Word-Count Limits, and Settlement Practices for America Invents Act Trial Proceedings Before the Patent Trial and Appeal Board”, 88 Fed. Reg. 24,503 (April 21, 2023)

available at <https://www.govinfo.gov/content/pkg/FR-2023-04-21/pdf/2023-08239.pdf>.

Accordingly, we decline to deny institution based on these arguments.

2. *Identification of Claim Construction, Structure or Acts Corresponding to Means-Plus-Function Limitations*

Patent Owner asserts that the requested *inter partes* review should be denied institution because Petitioner has failed to meet its burden under 37 C.F.R. § 42.104(b)(3), “indicating that petition must identify ‘[h]ow the challenged claim is to be construed.’” Prelim. Resp. 2; *see also id.* at 10–15. Patent Owner argues “Petitioner contends, in [the Related Litigation] that terms should be construed according to § 112, ¶ 6, but does not identify any alleged function or structure in the Petition, much less explain how the construed terms are met by the prior art.” *Id.* at 2 (citing Pet. 32, 40).

In particular, Patent Owner argues Petitioner does not propose claim constructions for the terms “code rate determining unit” (claim 1’s limitation [1d]) and “content transmitting unit” (claim 1’s limitation [1b]) found in the challenged claims even though, in the Related Litigation, Petitioner took the position these terms are means-plus-function limitations subject to interpretation under 35 U.S.C. § 112 ¶ 6. *Id.* at 10 (citing Ex. 2003, 4–7 (Petitioner’s claim construction brief in the Related Litigation)). Patent Owner argues, although Petitioner asserts Chou teaches the content transmitting unit of limitation [1b], to the extent it might be deemed a means-plus-function limitation, no further analysis is provided. *Id.* Moreover, Patent Owner argues Petitioner fails to show that Chou teaches that structure identified in the Related Litigation as corresponding to the code rate determining unit of claim limitation [1d] implements the disclosed

algorithms for performing the claimed function. *Id.* at 11–12 (citing Ex. 1001, 10:32, 10:54; Ex. 2003, 4–5). In deciding whether to deny *inter partes* review discretionarily under 37 C.F.R. § 42.104(b)(3)–(4) we determine that Petitioner complies with the applicable provisions of our rules by sufficiently identifying the claim construction it proposes as the basis for requesting review of the challenged claims. *See W. Digit. Corp. v. Spex Techs., Inc.*, IPR2018-00084, Paper 14 at 10–12 (PTAB April 25, 2018) (explaining that “37 C.F.R. § [42.]104(b)(3) does not require [p]etitioner to express its subjective agreement regarding correctness of its proffered claim constructions or to take ownership of those constructions”).

Under Rule 42.104(b)(3)–(4), a Petition must identify:

- (3) How the challenged claim is to be construed. Where the claim to be construed contains a means-plus-function or step-plus-function limitation as permitted under 35 U.S.C. 112(f), the construction of the claim must identify the specific portions of the specification that describe the structure, material, or acts corresponding to each claimed function;
- (4) How the construed claim is unpatentable under the statutory grounds identified in paragraph (b)(2) of this section. The petition must specify where each element of the claim is found in the prior art patents or printed publications relied upon.

37 C.F.R. § 42.104(b)(3)–(4).

Here, the Petition complies with the requirements set forth in 37 C.F.R. § 42.104(b)(3)–(4) because the Petition identifies that, for the purposes of this proceeding, all claim terms should be interpreted under their plain and ordinary meaning as understood by one of ordinary skill in the art.

Pet. 17 (explaining that “Petitioner is applying the prior art consistent with what appears to be [Patent Owner]’s interpretation of the claims as indicated in the Infringement Contentions [in the Related Litigation]” and that Petitioner has interpreted the claim terms under their “plain and ordinary meaning” in this proceeding). Moreover, although dependent claim 17 and independent claims 27–29 use the word “means,” the word “means” does not appear in independent claims 1, 11, 16, 21, 22, and 26 or in dependent claims 2–10, 12–16, 18–20, and 23–25.

For purposes of this proceeding, we presume that a claim limitation is not construed as a means-plus-function term when “means” is absent. *See Dyfan, LLC v. Target Corp.*, 28 F.4th 1360, 1365 (Fed. Cir. 2022) (“[T]his presumption is rebuttable [and] can be overcome if a challenger demonstrates that the claim term ‘fails to recite sufficiently definite structure.’”) (citing *Williamson v. Citrix Online, LLC*, 792 F.3d 1339, 1348–49 (Fed. Cir. 2015)).

With this understanding, Petitioner also identifies where each element of the claims is alleged to be found in the prior art. Pet. 24–25 (addressing “distribution system” for Ground 1), 26–28 (addressing “content transmitting unit” for Ground 1), 28–30 (addressing “content coded with . . . a code rate” for Ground 1), 30–33 (addressing the “reception device” for Ground 1), 33–34 (addressing “code rate determining unit” for Ground 1), 34–38 (addressing the code rate based on a “remaining time” of Ground 1), 38–40 (addressing the code rate based on “available reproduction time” of Ground 1), 41–42 (addressing the “content transmitting unit” of Ground 1), 42–43 (addressing the “content reproducing unit” of Ground 1).

Although, as argued by Patent Owner, Petitioner has submitted a proposed claim construction in the Related Litigation construing the terms “code determining unit” and “content transmitting unit” as means-plus-function terms governed by 35 U.S.C. § 112 ¶ 6 (Prelim. Resp. 10), we note that, conversely, Patent Owner proposes in the Related Litigation that the terms instead be construed under their plain and ordinary meaning, and not subject to 35 U.S.C. § 112 ¶ 6. Ex. 2003, 4–7, *see also* Related Litigation, Document 154 “Amended Joint Claim Construction Chart” filed February 5, 2024, at 5, 10. Moreover, Petitioner addresses in the alternative a means-plus-function construction of the code rate determining unit (limitation [1d]), citing to the ’101 patent for disclosing the recited functionality as being provided by a server and asserting that Chou teaches corresponding structure. Pet. 40 (citing Ex. 1001, 10:7–18). Although not explicitly characterizing the analysis as using an alternative mean-plus-function construction, Petitioner cites to the ’101 patent for disclosing server device 10 as a transmission device and unit (limitation [1b]), arguing Chou’s server as implemented on a general-purpose computing device teaches the limitation. *Id.* at 27–28 (citing Ex. 1001, 5:12–16, 5:64–67, 8:46–58).

In the context of this *inter partes* review, the rules do not require more than what Petitioner has done. Our interpretation of the rules is consistent with its regulatory history, which indicates that the goal for setting forth claim construction is to provide sufficient notice to Patent Owner, which has been adequately accomplished here. *See* Changes to Implement Inter Partes Review Proceedings, 77 Fed. Reg. 48,688 (Aug. 14, 2012); *id.* at 48,699–700 (Requirement for Claim Construction (§§ 42.104(b)(3), 42.204(b)(3), and 42.304(b)(3))). Therefore, the Petition complies with the requirements

set forth in 37 C.F.R. § 42.104(b)(3)–(4) as to at least claims 1–16 and 18–26, and the panel declines Patent Owner’s request to deny institution on the basis of an alleged deficiency in that regard.

3. *Same or Substantially Same Prior Art or Arguments*

Petitioner contends “[d]enial of institution under §325(d) would be inappropriate because this Petition relies on grounds and arguments not previously presented to the Office,” asserting “[t]he relied-upon art was not considered during prosecution.” Pet. 22.

Patent Owner contends we should deny institution under 35 U.S.C. § 325(d), arguing the Patent Office has previously addressed substantially the same prior art or arguments as those found in the Petition. Prelim. Resp. 46. More particularly, Patent Owner argues the disclosure of Chou (Ex. 1004), cited in each of the asserted grounds in the Petition, is substantially the same as the Hejna reference (Ex. 2011) that was cited by the Examiner during prosecution of the ’101 patent. *Id.* Patent Owner further contends Nobuyoshi (Ex. 1014), asserted by Petitioner in combination with Chou for teaching the limitations of claims 5, 7, and 15 under Ground 3 of the Petition (Pet. 46–47), was considered by the Examiner as indicated by the front page of the ’101 patent (Ex. 1001) such that “Petitioner’s cited art, therefore, ‘adds no teaching that was not before the Examiner.’” Prelim. Resp. 48 (citing *Dr. Reddy’s Lab ’ys S.A., v. Indivior UK Ltd.*, IPR2019-00328, Paper 21 at 16 (PTAB June 3, 2019); *Stryker Corp. v. KFx Med., LLC*, IPR2019-00817, Paper 10 at 23–25 (PTAB Sept. 16, 2019)). Finally, Patent Owner contends “Petitioner failed to establish the Office erred in a manner material to the patentability of the challenged claims.” *Id.* For the

reasons below, the preliminary evidence does not support this argument, and we decline to deny institution on this basis.

Section 325(d) provides that the Director⁸ may elect not to institute a trial if the petition challenges a patent based on matters previously presented to the Office:

In determining whether to institute or order a proceeding under this chapter, chapter 30, or chapter 31, the Director may take into account whether, and reject the petition or request because, the same or substantially the same prior art or arguments previously were presented to the Office.

The Board has set forth a two-part framework for this determination under § 325(d):

- (1) whether the same or substantially the same art previously was presented to the Office or whether the same or substantially the same arguments previously were presented to the Office; and
- (2) if either condition of [the] first part of the framework is satisfied, whether the petitioner has demonstrated that the Office erred in a manner material to the patentability of challenged claims.

Advanced Bionics, LLC v. MED-EL Elektromedizinische Geräte GmbH, IPR2019-01469, Paper 6 at 8 (PTAB Feb. 13, 2020) (precedential). Relevant to this analysis are six factors outlined in *Becton, Dickinson & Co. v. B. Braun Melsungen AG*, IPR2017-01586, Paper 8 (PTAB Dec. 15, 2017) (precedential as to § III.C.5, first paragraph):

- (a) the similarities and material differences between the asserted art and the prior art involved during examination;
- (b) the cumulative nature of the asserted art and the prior art evaluated during examination;

⁸ The Board institutes trial on behalf of the Director. 37 C.F.R. § 42.4(a).

(c) the extent to which the asserted art was evaluated during examination, including whether the prior art was the basis for rejection;

(d) the extent of the overlap between the arguments made during examination and the manner in which Petitioner relies on the prior art or Patent Owner distinguishes the prior art;

(e) whether Petitioner has pointed out sufficiently how the Examiner erred in its evaluation of the asserted prior art; and

(f) the extent to which additional evidence and facts presented in the Petition warrant reconsideration of the prior art or arguments.

Becton, Dickinson at 17–18 (formatting added). “[T]he *Becton, Dickinson* factors provide useful insight into how to apply the framework under 35 U.S.C. § 325(d).” *Advanced Bionics* at 9 (footnote omitted). Factors (a), (b), and (d) pertain to the first part of the *Advanced Bionics* framework, while factors (c), (e), and (f) pertain to the second part of that framework. *Id.* at 10.

As we discuss below, based on the *Advanced Bionics* framework, the preliminary record does not support Patent Owner’s request to deny institution.

As discussed in Section II (Background) *supra*, during prosecution of the ’101 patent, the Examiner cited, *inter alia*, the Hejna prior art reference but did not apply or reject the claims based on that or any other prior art reference. Ex. 1002, 37, 39. There is no disagreement the Chou reference was never cited or considered by the Examiner. Under *Becton, Dickinson* factor (a), we consider the similarities and material differences between the asserted Chou and Hejna references.

Patent Owner contends “[a]lthough Petitioner argues that Chou discloses or renders obvious element [1d], examination of the actual

disclosure of Chou reveals that its disclosure is substantially the same as Hejna, prior art of record.” Prelim. Resp. 46. Patent Owner argues that Chou’s disclosures of (1) selecting a target arrival time for each frame sufficiently in advance of its playback time, (2) controlling an upper bound on the time of arrival of bits into the client buffer, and (3) selection of a code rate such that the frame’s arrival time is as close to the target arrival time as possible, relied upon by Petitioner for teaching limitation [1d], are substantially the same as that of Hejna. *Id.* at 46–47 (citing Pet. 35; Chou, Ex. 1004 ¶¶ 19, 27; Hejna, Ex. 2011, 4:60–63, 8:50–57, 14:3–7).

Addressing *Becton*, *Dickinson* factors (a) and (b), Patent Owner fails to persuade us that Chou’s disclosure is substantially the same as or cumulative of Hejna’s. Even if, as alleged by Patent Owner, Hejna discloses subject matter corresponding to that disclosed by Chou, which subject matter is asserted by Petitioner as teaching claim 1’s element [1d], it is not clear why the disclosures are otherwise substantially the same. Although recognizing the Examiner’s reasons for allowance are based on the combination of limitations corresponding to claim 1’s elements [1b], [1d], and [1e], Patent Owner’s argument addresses only Petitioner’s reliance on Chou for teaching claim 1’s element [1d]. *See* Prelim. Resp. 46.

Furthermore, evidence extrinsic to the disclosures themselves does not suggest Chou’s disclosure is likely to be the same or substantially the same as Hejna. For example, the two references list no inventor in common, do not relate back to a common priority document, we ascertain no commonly cited prior art references cited during their respective prosecutions, nor do we find any other indicia that the disclosures are the same or substantially the same. *Compare* Ex. 1004, code (75), *with* Ex. 2011, codes (56), (75).

Finally, as to *Becton, Dickinson* factor (d), because there was no prior art rejection and, therefore, no arguments made during prosecution in connection with the cited prior art references, there is no overlap with the manner in which Petition now relies on the prior art, and factor (d), therefore, does not weigh heavily in the analysis.

In consideration of the first step of the *Advanced Bionics* framework and *Becton, Dickinson* factors (a), (b), and (d), we determine that neither the same or substantially the same art nor the same or substantially the same arguments were presented previously to the Office. Because the first step of the *Advanced Bionics* test is not satisfied, we need not proceed to the second part of the test. *See Advanced Bionics* at 8 (second step of the framework only applies “if either condition of the first part of the framework is satisfied”). Accordingly, we decline to exercise our discretion under 35 U.S.C. § 325(d) to deny institution of *inter partes* review.

E. Obviousness of Claims 1, 4–6, 10–16, and 19–26 over Chou (Petitioner’s Ground 1)

Petitioner alleges claims 1, 2, 4, 5, 7, 11, 12, 14–18, 20–23, and 25–29 would have been obvious over Chou. Pet. 24–61. Petitioner also relies on the Reader Declaration in support of its arguments. *Id.* (citing Ex. 1006 ¶¶ 109–243). As discussed below, and having reviewed the information and evidence provided by Petitioner and Patent Owner, including the relevant portions of the testimony of Dr. Reader (Ex. 1006) and Dr. Schonfeld (Ex. 2001), we are persuaded, on the current record, that Petitioner has demonstrated a reasonable likelihood of prevailing on this obviousness challenge.

1. *Chou*

Chou, titled “System and Process for Controlling the Coding Bit Rate of Streaming Media Data Employing a Linear Quadratic Control Technique and Leaky Bucket Model,” was filed on December 10, 2004, as U.S. Patent Application No. 11/010,114, naming Phillip A. Chou, Anders E. Klemets, and Cheng Huang as inventors. Ex. 1004, codes (21), (22), (54), (75). The reference describes a system for controlling the coding bit rate of streaming media data. *Id.* at code (57).

As background, Chou discloses buffering streaming media data, i.e., packets, to compensate for jitter, provide time for lost packet recovery, and continue playback during lapses in network bandwidth. Ex. 1004 ¶ 7. Chou explains client buffer size “can be expressed as the number of seconds of content in the buffer, called the buffer duration,” which “tends to increase as content enters the buffer and . . . decrease as content leaves the buffer.” *Id.* Chou further discloses compensating for decreased network capacity and resultant reduced content arrival rate by reducing the coding bit rate (i.e., the amount of data needed to represent a corresponding amount of media content) to prevent a rebuffering event. *Id.* ¶ 8.

Chou discloses a system that controls a coding bit rate of streaming media data by “dynamically adjusting the coding bit rate of the streaming media data to control client buffer duration” using a linear quadratic optimal control method. Ex. 1004, code (57), ¶ 19. This method is claimed to yield a smooth average bit rate over consecutive frames when deciding whether to change the coding bit rate by using a “leaky bucket model in[] the control loop so that the changes in buffer duration due to natural variations in the instantaneous coding bit rate are not mistaken for changes in buffer duration

due to network congestion.” *Id.* ¶ 19. Chou further states “[i]t is noted that in the present system and process, it is not the actual fullness of the client buffer that is controlled, but an upper bound on the time of arrival of bits into the client buffer to a target level. The upper bound is based on the leaky bucket model of the coding bit rate.” *Id.*

Chou describes a leaky bucket model with reference to its Figure 3, which is reproduced below.

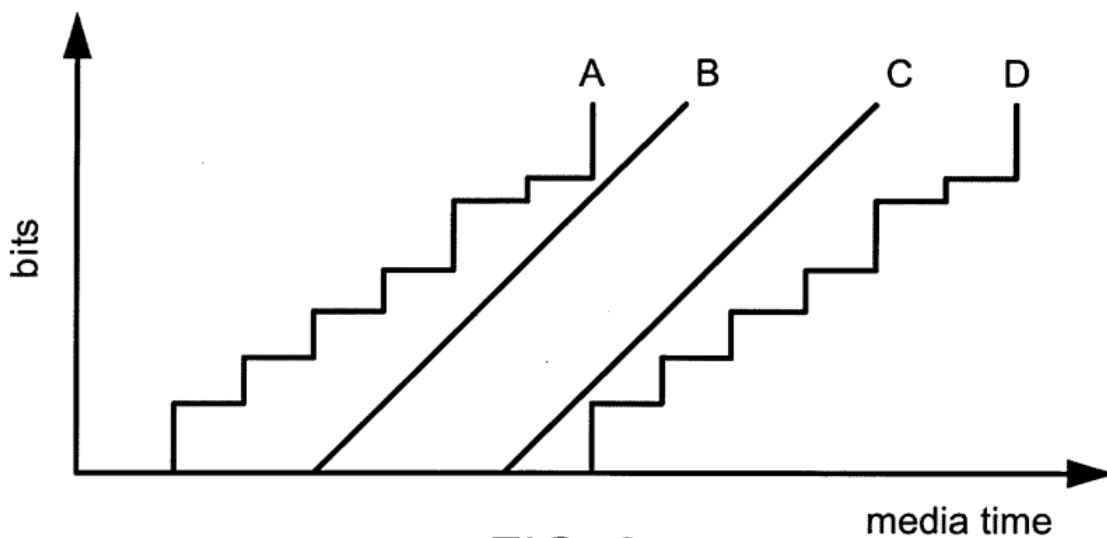


FIG. 3

Chou’s Figure 3, reproduced above, is a graph of schedules at which bits in a coded bit stream are put into an encoder buffer (Schedule A), are output from the encoder buffer and enter a communication channel (Schedule B), are delivered by the communication channel to a decoder buffer (Schedule C), and are removed from the decoder buffer and instantaneously decoded for presentation (Schedule D). Ex. 1004 ¶¶ 37, 60. Chou discloses Schedule B is a lower bound to Schedule A, i.e., limits the number of bits available to be output from the encoder buffer (Schedule B) to the number of bits put into the buffer (Schedule A) such that encoding of bits cannot fall behind the

subsequent transfer of encoded bits to the communication network. *Id.* Similarly, Chou describes Schedule C (provision of bits by the communication network to a decoding buffer) as an upper limit to Schedule D (removal of frames from the decoding buffer). Chou explains “the gap between Schedules A and B represents, at any point in time, the size in bits of the encoder buffer” (the value of which, i.e., $A-B$, is represented by the added blue-color graph line). *Id.* Likewise, “the gap between Schedules C and D represents the size of the decoder buffer” (the value of which, i.e., $C-D$, is represented by the added red color graph line)]. *Id.*

Chou describes the leaky bucket model incorporated into the control loop as a “metaphor for the encoder buffer,” where “[t]he encoder dumps $b(n)$ bits into the leaky bucket at [media] time $\tau(n)$, and the bits leak out at rate R .” Ex. 1004 ¶ 61. Chou explains “[i]f R is sufficiently low, then the bucket will never run dry (underflow), but if R is too low the bucket will eventually overflow,” and “[t]he largest R such that the buffer will never run dry is taken to be the average coding bit rater of the bit stream.” *Id.*

In addition to using the leaky bucket model, Chou further discloses a fast startup technique that controls the target level size of the client buffer over time, starting small to allow for a shorter startup delay, and growing the buffer over time to enhance system robustness. Ex. 1004 ¶¶ 20, 90. At the end of the startup process during which media data is streamed to the client at an initial coding bit rate, the client requests streaming media data be supplied at a new, optimal coding bit rate. *Id.* ¶ 115. Chou further discloses stabilizing code bit rate changes by limiting client requests for an increased coding bit rate to a rate that does not exceed the current moving average arrival rate of the frames except “if the current client buffer duration exceeds

the desired duration level by an amount that it is estimated will not be expended at the higher coding bit rate prior to the passing of a prescribed period of time (e.g., 60 seconds).” *Id.* ¶ 29.

2. *Independent Claim 1*

a) *[1a] A distribution system, including a transmission device and a reception device configured to be capable of communicating with each other*

Petitioner contends that Chou teaches such a system, arguing that “Chou is directed toward ‘a system and process for controlling a coding bit rate of streaming media data being transmitted to a client from a server over a computer network.’” Pet. 24 (quoting Ex. 1004 ¶ 19) (citing Ex. 1004 ¶¶ 2, 21, 31, 60, 115, claims 1, 47, 48). Petitioner further contends that “Figs. 11A–C further depict two-way communication between a ‘CLIENT’ and ‘SERVER.’” *Id.* (citing Ex. 1006 ¶ 111).

On the preliminary record before us and in the absence of any counterargument from Patent Owner, we are persuaded for purposes of this Decision that Petitioner makes a sufficient showing with respect to the preamble language of claim 1. At this stage of the proceeding, we need not make a determination whether the preamble of claim 1 is limiting.

b) *[1b] the transmission device being equipped with a content transmitting unit for transmitting content data, which is one content coded with any one code rate of a plurality of code rates different from each other, to the reception device*

Petitioner contends that Chou teaches this limitation. Pet. 26–30 (citing Ex. 1004 ¶¶ 19, 21–22, 31, 60, 69–70, 89, 91, 109–110, 112, 115, 118, 130, Figs. 11A–C; Ex. 1006 ¶ 113). In particular, Petitioner contends

Chou teaches “[t]he transmission device being equipped with a content transmitting unit for transmitting content data . . . to the reception device,” arguing that “Chou teaches ‘the server transmits the streaming media data’, and the streaming media data is ‘provided to the client.’” *Id.* at 26 (quoting Ex. 1004 ¶¶ 21, 23) (citing Ex. 1004 ¶¶ 19, 60, 31, Figs. 2, 11A–C).

Petitioner directs attention to Figure 11A of Chou as illustrating that the server transmits streaming media data to a client. *Id.* at 26–27 (reproducing Fig. 11A). Petitioner further argues Chou’s server is implemented on a general-purpose computing device, asserting “[t]his is consistent with the ’101 patent’s disclosure of a transmission device and unit, where server device 10 is a transmission device that includes content transmitting part 45.” *Id.* at 27–28 (citing Ex. 1010, 5:12–16, 5:64–67, 8:46–58; Ex. 1004 ¶¶ 48–57, Fig. 1; Ex. 1006 ¶115.) Petitioner further contends Chou teaches “transmitting . . . one content coded with any one code rate of a plurality of code rates different from each other to the reception device,” arguing “Chou discloses the ‘streaming media data . . . exhibits one of a number of coding bit rates’” and that Chou teaches the coding bit rate can be expressed as “the average number of bits needed to encode one second of content.” *Id.* at 28 (citing Ex. 1004 ¶¶ 7, 21, 22, 31, 115, 118, claim 2; Ex. 1006 ¶ 117).

Petitioner further contends Chou teaches limitation [1b], should it be deemed a means-plus-function limitation. *Id.* at 29–30. Relying on the above reasoning, and that argued in connection with limitation [1e] (*see infra* Section III.E.2.e.), Petitioner asserts Chou teaches the recited function. *Id.* at 29. Addressing structural equivalence, Petitioner argues Chou’s server implemented on a general-purpose computing device and including a modem 172 and program modules for transmitting streaming media data to a

client “is consistent with the ’101 patent’s disclosure of a transmitting unit, where server device 10 is a ‘transmission device’ that includes content transmitting part 45.” *Id.* at 29–30 (citing Ex. 1001, 5:12–16, 5:64–67, 8:46–58; Ex. 1004 ¶¶ 48–57, Fig. 1; Ex. 1006 ¶ 118). In the alternative, Petitioner argues the structure and functionality of limitation [1b] were generally known by POSITAs. *Id.* at 30 (citing Ex. 1006 ¶¶ 28–58, 70–77, 119).

On the preliminary record before us and in the absence of any counterargument from Patent Owner, we are persuaded for purposes of this Decision that Petitioner makes a sufficient showing with respect to this limitation.

c) [1c] the reception device being equipped with a content reproducing unit for, while receiving the content data transmitted by the transmission device, storing received data of the content data into a storage device and also reproducing the content based on the stored data,

Petitioner contends that Chou teaches this limitation. Pet. 30–33 (citing Ex. 1004 ¶¶ 2, 5, 7, 20, 28, 59, 67, 70, 115, Figs. 5, 11A–C; Ex. 1006 ¶ 121). In particular, addressing the data storage language of the limitation, Petitioner contends Chou’s disclosure that “[c]ontent enters the buffer when it arrives at the client over the network, at a rate of r_a/r_c seconds of content per second of real time” teaches a content reproducing unit for while receiving the content data transmitted by the transmission device, storing the received data of the content data into a storage device. *Id.* at 30 (quoting Ex. 1004 ¶ 7) (citing Ex. 1004 ¶¶ 19, 21, 23, 31, 113, 115, 117; Figs. 11A–C).

Addressing reproduction of content while receiving the content data, Petitioner contends Chou’s disclosure that the client “begin[s] playback . . .

of the streaming media data when the client's decoder buffer has the minimum amount of data therein that is needed to ensure an underflow condition does not occur" would have been understood by a POSITA as "when the minimum amount [of data] is reached, content begins playing out from the buffer while being received." Pet. 30–31 (quoting Ex. 1004 ¶ 28) (citing Ex. 1004 ¶ 115, Fig. 6; Ex. 1006 ¶ 124). Petitioner further argues Chou's disclosure that "[o]ver time . . . the buffer remains relatively constant . . . since content is received and played back at the same speed v " further teaches limitation [1c]'s "while receiving the content data transmitted by the transmission device, also reproducing the content." *Id.* at 31 (quoting Ex. 1004 ¶ 75).

Petitioner further contends Chou's disclosure "that it is important to 'control buffer duration to prevent the buffer from underflowing'" would have been understood by the POSITA to mean that "buffer fullness and duration are impacted by buffer fill rate and the rate at which content is being played out from the buffer" and, thus teach limitation [1c]. Pet. 31 (citing Ex. 1006 ¶ 125). Continuing along similar lines of reasoning, Petitioner directs attention to additional portions of Chou in support of argument that Chou teaches limitation [1c] (*id.* at 31–32 (citing Ex. 1004 ¶ 20; Ex. 1006 ¶¶ 124, 128–136)) and further argues limitation [1c] is taught by Applicant Admitted Prior Art ("AAPA") (*id.* at 32 (quoting Ex. 1001, 1:11–31) (citing Ex. 1006 ¶ 133)).

Petitioner further contends Chou also teaches limitation [1c] to the extent deemed a mean-plus-function limitation. Pet. 32. Petitioner contends Chou's client begins playback as soon as its decoder buffer has the minimum data necessary to avoid occurrence of an underflow condition and

continues playback thereafter. *Id.* (quoting Ex. 1004 ¶ 115). Petitioner argues the operation of Chou’s client

is consistent with the ’101 patent’s disclosure of a content reproducing unit, which discloses that a generic “content reproducing part 33 [of terminal device 20a], while receiving content data transmitted by the server device 10, stores received data of the content data into the storage device and reproduces content based on the stored data (performs streaming reproduction).”

Id. at 32–33 (quoting Ex. 1001, 9:51–55).

On the preliminary record before us and in the absence of any counterargument from Patent Owner, we are persuaded for purposes of this Decision that Petitioner makes a sufficient showing with respect to this limitation.

d) [1d] the distribution system, comprising a code rate determining unit for determining the code rate based on a remaining time before reproduction start time set as time at which the reception device starts reproduction of the content from a present moment and based on an available reproduction time, which is a time available for reproducing the content based on the content data stored in the wherein

Petitioner contends Chou teaches limitation [1d], particularly addressing portions of the limitation as follows. Pet. 33 (citing Ex. 1004, code (57), ¶¶ 7, 19–26, 29–32, 67, 69–70, 74, 81, 123, 130, Figs. 5–8, claims 1, 2, 13, 14; Ex. 1006 ¶ 137). Patent Owner presents counterargument as further discussed *infra*. Prelim. Resp. 18–24.

(i) the distribution system, comprising a code rate determining unit for determining the code rate . . .

Petitioner contends that Chou’s disclosure of “techniques for determining the most appropriate coding bit rate,” of “controlling a coding bit rate of streaming media data [by] dynamically adjusting the coding bit rate,” and that the coding bit rate is “the average number of bits needed to encode one second of content” teaches the recited code rate. Pet. 33–34 (emphasis omitted) (quoting Ex. 1004 ¶¶ 7, 19, 31) (citing Ex. 1004 ¶¶ 19–26, 29–32, 70, 81, 115–117; Ex. 1006 ¶ 140). Addressing the code rate determining unit language, Petitioner argues the limitation is taught by Chou’s disclosure that determination of code bit rate may be performed by either the client or the server. *Id.* at 34 (quoting Ex. 1004 ¶ 31) (citing Ex. 1006 ¶ 142).

On the preliminary record before us and in the absence of any counterargument from Patent Owner, we are persuaded for purposes of this Decision that Petitioner makes a sufficient showing with respect to this portion of limitation [1d].

(ii) determining the code rate based on a remaining time before reproduction start time set as time at which the reception device starts reproduction of the content from a present moment . . .

Petitioner contends that Chou teaches “setting the coding bit rate to control frame arrival time to achieve [a desired] target buffer duration [(i.e., amount)]” where the “buffer duration is the difference between the reproduction start time ([Chou’s] playback deadline) and the target buffer duration.” Pet. 34–35 (quoting Ex. 1004 ¶ 19 (“coding bit rate control is

formulated as a standard problem . . . in which the client buffer duration is controlled as closely as possible to a target level.”)) (citing Ex. 1004 ¶¶ 27–29, 70–75; Ex. 1006 ¶ 143). Petitioner contends Chou discloses providing sufficient time between a target arrival time of a frame and its playback to adjust for network delays and avoid late frame arrival, e.g., the frame arriving after its scheduled playback time. *Id.* at 35 (citing Ex. 1004 ¶ 27).

According to Petitioner,

a POSITA would have understood that selection of a code rate for encoding the frame at the present time in Chou, which determines the number of bits to be transmitted for the frame, is done such that the frame’s arrival time is as close to the target arrival time as possible under current network conditions.

Id. (quoting Ex. 1004 ¶ 19).

According to Petitioner, “[b]ecause ‘the amount of time between the target time of a frame and its playback time’ is known, the code rate is selected based on the ‘remaining time before reproduction start time set as time at which the reception device starts reproduction of the content from a present moment.’” Pet. 35–36 (citing Ex. 1004 ¶ 27). Petitioner argues Chou’s determination of a code rate represents a present moment such that the code rate determining unit determines a playback deadline for the subject frame (i.e., the time reproduction of the frame will start from the present moment) and “adjusts the code rate so that the subject frame arrives at the decoder buffer at or near its target scheduled arrival time.” *Id.* at 36 (citing Ex. 1004 ¶¶ 27–29, 70–75; Ex. 1006 ¶ 145).)

Petitioner provides the following annotated version of Chou’s Figure 6, asserting the figure “describes frame playback deadlines and a

target arrival schedule used to achieve a desired target buffer duration.”

Pet. 36–37 (citing Ex. 1004 ¶¶ 70–75; Ex. 1006 ¶ 146).

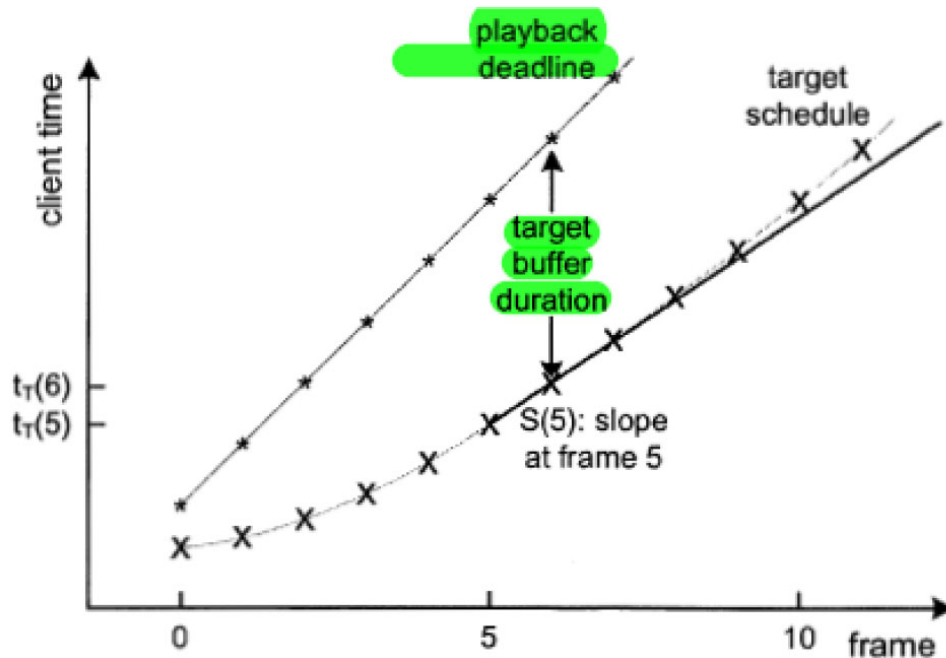


FIG. 6

Annotated Figure 6, depicted above, is a graph showing a target arrival design. Ex. 1004 ¶ 40. Petitioner argues “*Chou* discloses that “[t]he gap between the playback deadline and the target schedule is the desired client buffer duration (in client time).” Pet. 36 (quoting Ex. 1004 ¶ 74).

Petition further argues,

This gap between the time at which *Chou*’s system is determining the coding bit rate for a given frame (to meet the target arrival schedule) and the playback deadline for that frame, is the claimed “remaining time before reproduction start time set as time at which the reception device is to start reproduction of the content from a present moment.” Thus, *Chou* teaches controlling coding rates based on the time available for reproducing the content based on the content data stored in the buffer.

Id. at 37 (citing Ex. 1004 ¶¶ 70–75; Ex. 1006 ¶ 147).

Petitioner further argues that “at the moment Chou’s system is determining the new coding bit rate, it examines the desired target arrival time based on the target schedule for that frame (e.g., by looking at the slope) and adjusts the coding rate accordingly.” Pet. 38 (citing Ex. 1006 ¶ 148).

On the preliminary record before us and in the absence of any counterargument from Patent Owner, we are persuaded for purposes of this Decision that Petitioner makes a sufficient showing with respect to this portion of limitation [1d].

(iii) and [determining the code rate] based on an available reproduction time, which is a time available for reproducing the content based on the content data stored in the storage device of the reception device

1. Petitioner’s Contentions

Petitioner contends that Chou teaches determining the code rate based in part “on . . . an available reproduction time (‘buffer duration’).” Pet. 8 (citing Ex. 1004 Fig. 5, Ex. 1006 ¶ 90). More specifically, Petitioner argues “Chou teaches an ‘available reproduction time’ because the client has a buffer and ‘[t]he size of the client buffer can be expressed as the number of seconds of content in the buffer, called the buffer duration.’” *Id.* (quoting Ex. 1004 ¶ 7). Directing attention to Fig. 5 of Chou (reproduced below), Petitioner asserts “frames arrive at the client between the upper and lower bounds, in an ‘arrival schedule’” *Id.* (citing Ex. 1004 ¶ 67). Petitioner further argues “the gap between a frame’s arrival time and its playback deadline is the client buffer duration at the time of the frame arrival.” *Id.* (quoting Ex. 1004 ¶ 67, Fig. 5). Thus, according to Petitioner, “the gap between the

‘arrival schedule’ and ‘playback deadline’ is the ‘buffer duration,’ equivalent to the ‘available reproduction time.’” *Id.* (citing Ex. 1004 ¶ 67).

Petitioner further argues “*Chou* further teaches determining the code rate based on an available reproduction time as claimed.” Pet. 38. In particular, Petitioner contends “*Chou* discloses ‘controlling a coding bit rate of streaming media data being transmitted to a client from a server’ involves ‘dynamically adjusting the coding bit rate of the streaming media data to control the buffer duration.’” *Id.* (quoting Ex. 1004 ¶ 19) (citing Ex. 1004 ¶¶ 19–26, 29–32). Petitioner argues, because *Chou* defines buffer duration as “[t]he size of the client buffer . . . expressed as the number of seconds of content in the buffer” that “[t]herefore, buffer duration indicates a ‘number of seconds of content’ in the buffer.” *Id.* (quoting Ex. 1004 ¶ 7) (citing Ex. 1006 ¶ 149). Petitioner next asserts “*Chou* teaches controlling buffer duration to a desired amount.” *Id.* at 38–39 (quoting Ex. 1004 ¶ 19 (“coding bit rate control is formulated as a standard problem . . . in which the client buffer duration is controlled as closely as possible to a target level.”) (citing Ex. 1006 ¶ 150)). According to Petitioner, “[t]hus, *Chou* examines the current buffer duration to determine whether arrival of a subsequent frame needs to be accelerated (increasing buffer duration) or delayed (decreasing buffer duration).” *Id.* at 39.

Petitioner further argues “*Chou* . . . discloses ‘regulating the coding bit rate so that the client buffer does not underflow’ and ‘the arrival times of all frames will certainly be earlier than their playback deadlines’ to insure uninterrupted playback.” Pet. 39 (quoting Ex. 1004 ¶ 70). Petitioner provides the following reproduction of *Chou*’s Figure 5, describing it as “illustrat[ing]

playback deadlines . . . as they relate to client time.” *Id.* (citing Ex. 1004 ¶ 59, Fig. 6; Ex. 1006 ¶ 152).

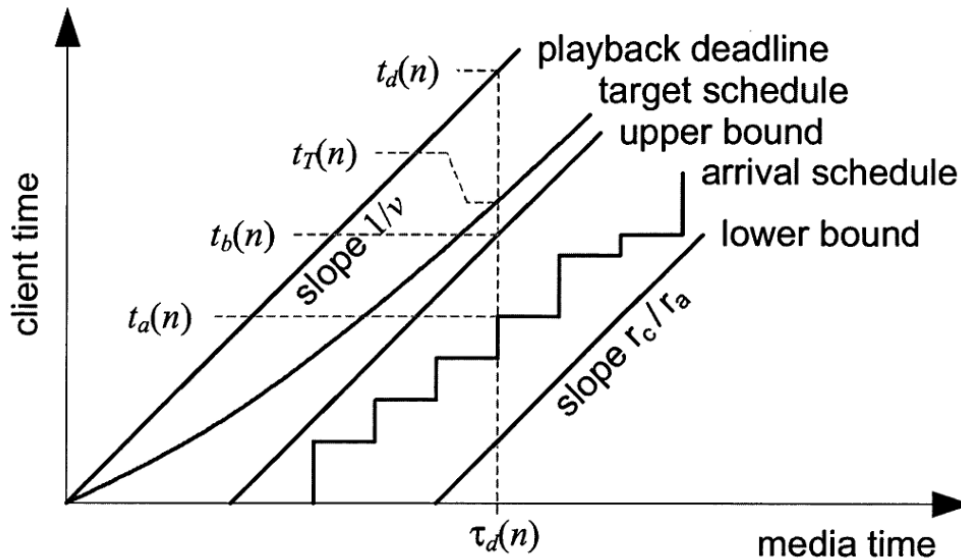


FIG. 5

Figure 5 of Chou, reproduced above, “is a graph showing an arrival schedule and its upper bound in client time vs. media time, where the upper bound is controlled to a target schedule that is increasingly in advance of the playback deadline to provide greater robustness over time.” Ex. 1004 ¶ 39. Petitioner argues “the time between a playback deadline of a frame and its arrival time ($t_d(n) - t_a(n)$) is the remaining time before that frame is to be played . . . [which] *Chou* refers to . . . as the buffer duration.” Pet. 39–40 (citing Ex. 1004 ¶¶ 67–68, 70, 74, 81, Figs. 5–6; Ex. 1006 ¶ 153). Petitioner asserts “[t]hus, *Chou* teaches ‘an available reproduction time, which is a time available for reproducing the content based on the content data stored in the storage device of the reception device,’ as claimed.” *Id.* at 40 (citing Ex. 1006 ¶ 153).

Petitioner further argues limitation [1d] is taught by Chou even if deemed a means-plus-function limitation. *Id.* Petitioner refers to the above arguments in support of Chou’s teaching of the recited function. Pet. 40. Petitioner asserts Chou teaches the function being performed by the code rate determining unit as part of either Chou’s client device or the server. *Id.* (quoting Ex. 1004 ¶ 31) (citing Ex. 1004 ¶ 130; Ex. 1006 ¶ 154). Petitioner asserts the corresponding structure described by the ’101 patent is code rate determining part 47. *Id.* (quoting Ex. 1001, 10:7–18). Alternatively, Petitioner argues “[1d]’s structure and functionality were also generally known by POSITAs . . . , rendering it obvious even if not explicitly taught by Chou.” *Id.* (referencing the Background section of the Petition) (citing Ex. 1006 ¶¶ 28–58, 70–77, 156).

2. Patent Owner’s Contentions

a. an available reproduction time

In response to Petitioner’s contentions, Patent Owner argues Chou does not disclose “an available reproduction time, which is a time available for reproducing the content based on the content data stored in the storage device of the reception device.” Prelim. Resp. 20 (citing Ex. 2001 ¶¶ 49–53). Patent Owner argues Petitioner provides insufficient support in Chou “to reach the conclusion that ‘Chou examines the current buffer duration’ and ignores the portion from that paragraph where Chou expressly states that it is not the actual fullness of the buffer that is controlled.” *Id.* at 20–21 (citing Pet. 38; Ex. 1006 ¶ 150; Ex. 2001 ¶ 50) (emphasis omitted). Thus, Patent Owner argues, Petitioner’s expert declaration is conclusory, directly in conflict with Chou’s disclosure, and entitled to little weight. Patent Owner argues, even if true, “Petitioner fails to explain why the disclosed ‘client

buffer duration,’ according to Chou, is ‘an available reproduction time, which is a time available for reproducing the content based on the content data stored in the storage device.’” *Id.* at 21 (citing Pet. 38–39; Ex. 2001 ¶ 51).

Patent Owner argues “[n]owhere does the Petition allege that the difference in playback time and arrival time is determined or otherwise calculated in Chou’s system (because it is not).” *Id.* at 22 (citing Ex. 2001 ¶ 51). Patent Owner further argues, even if Petitioner is correct in asserting that the gap between a frame’s arrival time and its playback deadline is the client buffer duration at the time of the frame arrival, “the ‘gap’ is not ‘a time available for reproducing the content based on the content data stored in the storage device of the reception device’ as required by Claim 1.” *Id.* (citing Pet. 40; Ex. 2001 ¶ 51). Patent Owner argues

subtracting the playback time from the time of arrival is not a time for reproducing content based on the content data stored because it does not account for times where the buffer may not have any content data to playback until that frame is played or times where there is excess content data that could be played out after that frame is scheduled to begin playback.

Id. (citing Ex. 2001 ¶ 51).

b. determining the code rate based on . . . an available reproduction time

Patent Owner contends Chou does not teach “a code rate determining unit for determining the code rate based on . . . an available reproduction time, which is a time available for reproducing the content based on the content data stored in the storage device of the reception device.” Prelim. Resp. 23 (citing Ex. 2001 ¶ 54). Patent Owner argues “since Chou fails to disclose ‘an available reproduction time,’ it also fails to disclose

‘determining the code rate based on’ available reproduction time.” *Id.* (citing Ex. 2001 ¶ 55). Patent Owner contends there is insufficient support for Petition’s statement that “Chou examines the current buffer duration to determine whether arrival of a subsequent frame needs to be accelerated (increasing buffer duration) or delayed (decreasing buffer duration).” *Id.* at 23–24 (quoting Pet. 39) (citing Ex. 2001 ¶ 56). In particular, Patent Owner asserts, Chou explicitly discloses controlling an upper bound on the time of arrival of bits into the client buffer to a target level, rather than controlling the fullness of the client buffer. *Id.* (citing Ex. 2001 ¶ 56). According to Patent Owner, “not only does Chou not disclose ‘determining a code rate . . . based on . . . the available reproduction time,’ it expressly **teaches against** doing so and modifying Chou as Petitioner alleges ‘would destroy the basic objective’ of Chou.” *Id.* at 24–25 (citing *TriVascular, Inc. v. Samuels*, 812 F.3d 1056, 1068 (Fed. Cir. 2016); Ex. 2001 ¶ 57). Accordingly, Patent Owner argues, “there is no motivation to modify Chou as alleged in the Petition,” and institution should be denied. *Id.* at 25 (citing *Johns Manville Corp. v. Knauf Insulation, Inc.*, IPR2018-00827, Paper 9 at 20 (PTAB Oct. 16, 2018) (informative) (denying institution where the “reasons for such modifications, and whether there would be a reasonable expectation of success are not adequately supported”); Ex. 2001 ¶ 58).

3. Analysis

As explained below, having considered the parties’ respective arguments, we are persuaded for purposes of this Decision that Petitioner makes a sufficient showing with respect to this portion of limitation [1d].

a. an available reproduction time

We have reviewed Patent Owner’s arguments and evidence and determine that Petitioner has established that Chou’s target buffer duration, which provides sufficient time between a target arrival time of a frame and its playback time, represents a time available for reproducing the content based on the content data stored in the storage device of the reception device and, accordingly, teaches the argued “available reproduction time.” *See* Pet. 8 (asserting Chou teaches an available reproduction time). Furthermore, to the extent Patent Owner argues that Chou does not teach examining the current buffer duration (*see* Prelim. Resp. 20–21), we find no requirement to examine buffer duration recited by claim 1, only to determine the code rate based on available reproduction time.

Moreover, Patent Owner’s arguments concerning examining buffer fullness (*see id.* at 20–21) and calculating a difference in playback and arrive times (*see id.* at 22) do not appear to be commensurate in scope with claim 1, which has no such requirements, much less a requirement to monitor the actual reproduction time of content data stored in the storage device of the reception device. Limitation [1d] merely requires that a coding rate be determined “based on” an available reproduction time. As cited by Petitioner, Chou describes “dynamically adjusting the coding bit rate to control client buffer duration . . . [u]sing the theory of optimal linear quadratic control[of] the client buffer duration.” Ex. 1004, code (57) (cited by Pet. 38). Thus, on the preliminary record before us, we are persuaded by Petitioner’s showing that Chou’s coding bit rate is adjusted in response to or “based on” maintaining client buffer duration (i.e., available reproduction time) at a target level. *See* Pet. 38.

We also disagree with Patent Owner that Chou's statement that "in the present system and process, it is **not** the actual fullness of the client buffer that is controlled" conflicts with Chou's teaching of examining the current buffer duration. *See* Prelim. Resp. 24. As an initial matter, as argued by Petitioner, Chou discloses "the gap between a frame's arrival time and its playback deadline is the client buffer duration." Pet. 8 (citing Ex. 1004 ¶ 67). Patent Owner fails to explain why Chou's disclosed control of an upper bound on the time of arrival of bits, thereby controlling a frame's arrival time, fails to result in also controlling (albeit indirectly) buffer duration.

Furthermore, although Chou uses optimal linear quadratic control of client buffer duration to "prevent the buffer from underflowing, while keeping the average coding bit rate close to the average transmission bit rate of the network" (Ex. 1004, code (57)), Patent Owner provides insufficient evidence that Chou teaches against also monitoring actual fullness of the client buffer. *See* Prelim. Resp. 24. To the contrary, Chou discloses a client requesting a new coding bit rate "if the current client buffer duration exceeds the desired duration level by [a specified] amount." Ex. 1004 ¶ 29. Furthermore, Chou discloses a fast startup technique wherein "playback can begin while the buffer duration is still low" by choosing a low initial coding bit rate to grow the client buffer "until the buffer duration [is] sufficiently high to guarantee continuous playback over the long term." *Id.* ¶ 90. Thus, Chou does not teach away from monitoring, much less controlling, actual fullness of the client buffer.

We are also unpersuaded that Chou's "'gap' is not 'a time available for reproducing the content based on the content data stored in the storage

device of the reception device’ as required by Claim 1” based on Patent Owner’s argument that “it does not account for time where the buffer may not have any content data.” Prelim. Resp. 22. Even if correct, Patent Owner does not explain why this special case negates Chou’s “gap” otherwise representing a time available for reproducing the content (e.g., during normal operations when the buffer does store content).

b. determining the code rate based on . . . an available reproduction time

Because, for the reasons discussed above, we disagree with Patent Owner’s premise that Chou fails to teach “an available reproduction time,” we are not persuaded by Patent Owner’s argument that it necessarily also fails to disclose “determining the code rate based on” available reproduction time. Prelim. Resp. 23. For the reasons discussed *supra*, we are also unpersuaded by Patent Owner’s argument that, in essence, Chou’s statement that “it is not the actual fullness of the client buffer that is controlled” means buffer fullness is not affected by what is controlled, i.e., by controlling an upper bound on the time of arrival of bits into the client buffer to a target level. *See id.* at 24. Likewise, for the reasons discussed *supra*, we disagree with Patent Owner’s argument that Chou teaches against “determining a code rate . . . based on . . . the available reproduction time” or that modifying Chou to do so “would destroy the basic objective” of Chou. *See id.* at 24–25.

e) [1e] the content transmitting unit is configured to change the code rate of the content data to be transmitted to the reception device to the determined code rate; and

Petitioner contends that Chou teaches this limitation. Pet. 41–42 (citing Ex. 1004, code (57), ¶¶ 19, 21, 31, 70; Ex. 1006 ¶ 158). In particular, Petitioner argues Chou teaches “changing the code rate of the content data by generating or selecting a stream with a desired code rate.” *Id.* at 41 (quoting Ex. 1004 ¶ 31) (citing Ex. 1006 ¶ 159). Petitioner further argues Chou “describes changing or switching the code rate with reference to FIG. 10 [reproduced below] that ‘upon receiving the feedback [from the client], the server selects a stream with coding bit rate . . . as high as possible.’” *Id.* (quoting Ex. 1004 ¶ 98) (citing Ex. 1006 ¶ 160).

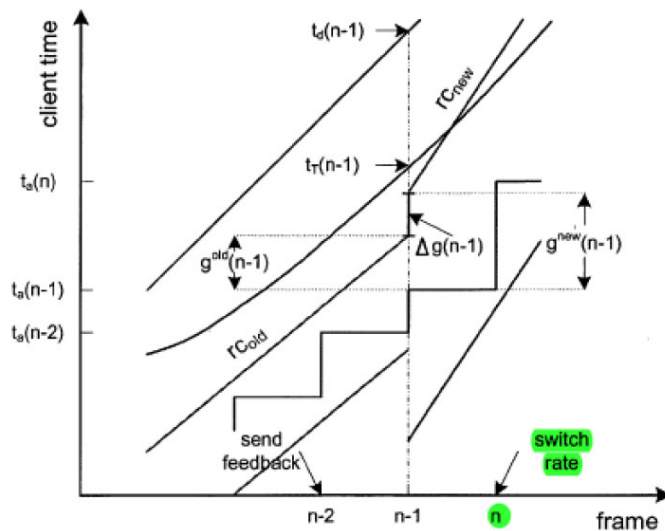


FIG. 10

Chou’s Figure 10, as annotated by Petitioner and appearing at page 42 of the Petition, is reproduced above, depicting a graph showing buffer tube changes and control target adjustments. Ex. 1004 ¶ 44.

In the alternative, Petitioner further contends the functionality of limitation [1e] “was also generally known by POSITAs . . . , rendering this limitation obvious.” Pet. 42.

On the preliminary record before us and in the absence of any counterargument from Patent Owner, we are persuaded for purposes of this Decision that Petitioner makes a sufficient showing with respect to this limitation.

f) [1f] the content reproducing unit is configured to start reproduction of the content at the set reproduction start time.

Petitioner contends that Chou teaches this limitation. Pet. 42–43 (citing Ex. 1004 ¶¶ 19–20, 59, 67, 115, Fig. 5; Ex. 1006 ¶ 163). In particular, Petitioner argues “Chou discloses that the client provides ‘continuous playback’ when the media data arrives before the ‘playback deadline. . . , which is the time . . . at which [a] frame . . . is scheduled to be played[.]’” *Id.* at 42 (citing Ex. 1004 ¶ 67; Ex. 1006 ¶ 164). According to Petitioner, “[t]he playback deadline is a ‘schedule at which frames are removed from the decoder buffer and instantaneously decoded for presentation.’” *Id.* at 42–43 (quoting Ex. 1004 ¶ 60). Petitioner argues “[t]hus, for each frame received by the client, the client plays back the frame at its playback deadline.” *Id.* at 43 (citing Ex. 1004 ¶¶ 60, 67; Ex. 1006 ¶ 164). Petitioner further argues that “Chou . . . explains in ¶0059 and ¶0067 that the playback deadline ‘is the time $t_d(n)$ at which frame n is scheduled to be played (after instantaneous decoding).’” *Id.* (quoting Ex. 1004 ¶ 67) (citing Ex. 1006 ¶ 165). In the alternative, Petitioner argues “[1f]’s functionality was also generally known by POSITAs, rendering this limitation obvious.” *Id.* (citing Ex. 1006 ¶ 166).

On the preliminary record before us and in the absence of any counterargument from Patent Owner, we are persuaded for purposes of this Decision that Petitioner makes a sufficient showing with respect to this limitation.

g) Conclusion Regarding Claim 1

Accordingly, at this stage of the proceeding, we determine that Petitioner has established a reasonable likelihood of prevailing on its assertion that claim 1 would have been obvious over Chou.

3. Independent Claims 11, 16, 21, 22, and 26–29

Petitioner refers back to its arguments for claim 1 for all limitations of independent claims 11, 16, 21, 22, and 26–29. Pet. 50–61. With respect to claim 11, Petitioner contends the recited method is taught because “*Chou* further teaches a ‘process for controlling a coding bit rate of streaming media data being transmitted to a client from a server.’” *Id.* at 50 (quoting Ex. 1004 ¶ 19) (citing Ex. 1006 ¶ 192). With respect to claim 16, Petitioner contends it is “substantially similar to [1a]–[1b], [1d]–[1e], but is drafted from the perspective of a transmission device rather than the distribution system.” *Id.* at 52 (citing Ex. 1006 ¶ 201). Petitioner contends the recited transmission device is taught because “*Chou* teaches operation by a client/reception device and/or a server/transmission device for any of [claim 16] and its dependents.” *Id.* (quoting Ex. 1004 ¶¶ 31, 130) (citing Ex. 1006 ¶ 201). With respect to claims 21’s and 26’s recitations of a non-transitory computer-readable storage medium that stores a program comprising instructions, Petitioner contends such embodiments are taught by Chou’s disclosure that “the disclosed process ‘may be described in the general context of computer-executable instructions, such as program

modules, being executed by a computer”” and because Chou’s claim 46 is directed specifically to a computer-readable medium. *Id.* at 54, 57 (quoting Ex. 1004 ¶¶ 31, 50, 130) (citing Ex. 1004 ¶¶ 51–55, Ex. 1006 ¶¶ 210, 211, 222).

Patent Owner relies on the same arguments for claims 11, 16, 21, 22, and 26–29 as for claim 1. *See* Prelim. Resp. 16–17. For the reasons discussed in Section III.E.2 above with respect to claim 1, and based on Petitioner’s further arguments addressing the additional limitations of claims 11, 16, 21, and 26–29, we conclude that Petitioner additionally shows a reasonable likelihood of prevailing with respect to claims 11, 16, 21, 22, and 26–29.

4. *Dependent Claims 2, 4, 5, 7, 12, 14, 15, 17, 18, 20, 23, and 25*

For dependent claims 2, 4, 5, 7, 12, 14, 15, 17, 18, 20, 23, and 25, Petitioner argues with citations to Chou and Dr. Reader’s testimony that Chou teaches each of the claims’ additional limitations. Pet. 43–54, 56–57. Patent Owner does not provide any arguments specifically for any of the challenged dependent claims, but relies only on the arguments presented for the independent claims. *See* Prelim. Resp. 17.

Based on the arguments presented and the evidence cited in the Petition, Petitioner shows a reasonable likelihood of prevailing on each of claims 2, 4, 5, 7, 12, 14, 15, 17, 18, 20, 23, and 25 in its challenge based on Chou.

F. *Obviousness of Claims 1, 4–6, 10–16, and 19–26 over Chou and Wang
(Petitioner’s Ground 2)*

1. *Wang*

Wang relates to “multimedia streaming and, more particularly, to receiver buffer fullness management of the multimedia streaming client.” Ex. 1016, 1:8–10. Wang discloses “provid[ing] to a sender of RTP [(real-time transport protocol)] packets the actual receiver buffer fullness level in a receiver of the RTP packets at a certain time instant represented as the remaining playout duration in time.” Ex. 1016, 2:50–53. Wang further discloses an implementation by “providing the sender the sequence number of any RTP packet in the receiver buffer and the time difference between the scheduled playout time of this packet and the current time.” Ex. 1016, 2:53–57. According to Wang, based on the remaining playout duration in time in the receiver buffer, a “server [changes] the transmission characteristic by bitstream switching, transmission rate decoupling where the transmission rate is different from the designated rate in order to increase or decrease the receiver buffer level.” Ex. 1016, 6:28–35.

2. *Independent Claim 1*

a) *Petitioner’s Contentions*

Petitioner contends that Chou teaches [1a]–[1c] and [1e]–[1f] for the reasons given in Ground 1 (*see supra* §§ II.E.2.a–c, e–f). In the alternative, under Ground 2, Petitioner relies on Wang for teaching [1d]. Pet. 62. According to Petitioner, “*Wang* discloses adjusting ‘the transmission rate and/or nominal playout rate of the different media to maintain the receive buffer fullness level.’” *Id.* Petitioner contends Wang’s buffer-stored RTP packets, each including “a sequence number and a timestamp known to the

sender” teach “a difference between a present moment and a scheduled playout time (i.e., reproduction start time) of the selected packet (i.e., remaining time). *Id.* at 62–63 (quoting Ex. 1016, 5:8–19) (citing Ex. 1006 ¶ 251; Ex. 1016, 3:33–36, 5:8–19, 5:35–37, 6:39–44). Using this timing information, Petitioner contends Wang calculates a current actual receiver buffer fullness, T_{last} . *Id.* at 63 (quoting Ex. 1016, code (57), 5:35–37) (citing Ex. 1006 ¶ 252; Ex. 1016, 3:44–47, 5:57–59). Petitioner further contends Wang’s disclosure of using receiver buffer fullness level to adjust the transmission characteristic

teaches changing the code rate, based on receiver buffer fullness level (available reproduction time), and based on the sequence number of a selected RTP packet in the receiver buffer and the time difference between the scheduled playout time of this packet and the current time (remaining time before reproduction start time). That is, Wang teaches calculating a change in code rate based on both the remaining time before reproduction start time and an available reproduction time, as required by [1d].

Id. (quoting Ex. 1016, code (57), 6:31–37) (citing Ex. 1006 ¶¶ 253–257).

Finally, Petitioner further contends the “teachings of Wang can also be applied in situations where content is being received into the buffer but the initial content playback (i.e., the start of the content being played back) has yet to begin,” explaining how, according to Petitioner, Wang’s teachings would provide “the requirements of [1d] in the situation where playback has yet to begin.” Pet. 64–65 (quoting Ex. 1016, 5:32–44) (citing Ex. 1006 ¶ 257).

Addressing motivation to combine, Petitioner contends “Chou, Wang, and the ’101 patent all manage buffer duration/fullness (based on time) in order to prevent buffer underflow” and “all view buffer duration/fullness in

terms of time.” Pet. 69–70 (emphasis omitted) (quoting Ex. 1004 ¶¶ 7, 19–20, Ex. 1016, code (57), 1:8–10, 1:21–27) (citing Ex. 1006 ¶¶ 271–273). Petitioner further contends “Chou and Wang both measure similar buffer characteristics to the ’101 patent.” *Id.* at 70 (emphasis omitted). According to Petitioner “two factors Chou utilizes in determining whether to adjust the code rate to prevent underflow are (1) the amount of time between arrival of a frame and its playback time, and (2) the number of seconds of data available on the buffer.” *Id.* at 71 (citing Ex. 1006 ¶ 274). Petitioner argues “*Wang* similarly discloses controlling code rate,” using “two factors . . . in determining whether to adjust the transmission rate to prevent underflow are (1) the time difference between a frame and its scheduled playout time, and (2) the amount of time available on the buffer to be played back.” *Id.* at 71–72 (quoting Ex. 1016, 2:50–66) (citing Ex. 1006 ¶ 275). According to Petitioner “Chou and Wang both disclose controlling code rate to control buffer duration/fullness to prevent buffer underflow.” *Id.* at 72 (emphasis omitted). Petitioner contends

Chou primarily focuses on managing buffer duration by controlling the code rate (which Chou describes as “the average number of bits needed to encode one second of content”) of the content being transmitted over the network. EX1004, ¶0007. However, Chou also recognizes that “the buffer duration can be increased by increasing r_a , decreasing r_c , and/or decreasing v (and vice versa for decreasing the buffer duration),” where r_a “is the arrival rate, or average number of bits that arrive at the client per second of real time,” r_c is the code rate, and v is the playback rate. EX1004, ¶0007. Wang manages buffer duration by controlling the transmission characteristics of content over the network (EX1016, Abstract), including the code rate. EX1006, ¶277.

Id. (emphasis omitted).

Petitioner argues “[a] POSITA would have been motivated to combine *Chou* and *Wang*” because incorporating Wang’s teaching of “additional precision in the timing information utilized to determine buffer fullness . . . would further advance Chou’s objective to provide optimum quality received content data within the available channel bandwidth.” Pet. 73 (citing Ex. 1004, code (57), ¶¶ 19–21; Ex. 1006, ¶ 278; Ex. 1016, code (57) , 1:64–2:16, 2:50–3:9).

b) Patent Owner’s Contentions

(i) Code Rate

Patent Owner contends Wang fails to teach limitation [1d]’s code rate. Prelim. Resp. 28. According to Patent Owner “Wang discloses adjusting ‘the transmission rate and/or nominal playout rate . . . to maintain the receive[r] buffer fullness level[.]’” *Id.* (quoting Pet. 62) (internal citations omitted). However, according to Patent Owner, Wang’s “‘transmission rate’ is the number of packets that the sender sends per unit of time” and “refers to the rate of packet transmission, not to changes to the code allowing for distinct code rates as required by the Challenged Claims of the ’101 Patent.” *Id.*; *see also id.* at 39–41.

(ii) Motivations to Combine

Patent Owner contends a POSITA would not have been motivated to combine the teachings of Chou and Wang based on two arguments:

1. “Chou discloses that it is not the actual buffer fullness that is controlled by the disclosed algorithm and thus teaches that the actual buffer fullness level should not be controlled even if it was allegedly taught by Wang.” Prelim. Resp. 30, *see also id.* at 35.

2. “Wang and Chou are directed to different technologies—active encoding applications and transport-layer protocols, respectively—within the broad field of multimedia systems that are deployed at different network layers and operate independently to preserve efficiency and modularity in network system design.”

Prelim. Resp. 30 *Id.*; *see also id.* at 34–35.

*(iii) Scope of Wang’s Teaching vis-à-vis
Limitation [1d]*

Patent Owner contends the Petition is unclear about what element of Wang is alleged to be incorporated into Chou. Prelim. Resp. 31 (citing Ex. 2001 ¶ 72). According to Patent Owner,

it is unclear whether the Petition is arguing that Wang could theoretically be combined with Chou to remedy the entire deficiency of Chou’s failure to disclose Claim Element [1d] or if the Petition is arguing that Wang could be combined with Chou to remedy only a portion of Claim Element [1d].

Id. (citing Pet. 69–75 (§IX.D.1); Ex. 2001 ¶ 72).

Patent Owner argues “[a]s such, the Petition fails to articulate what combination it is proposing and is therefore deficient.” Prelim. Resp. 31 (citing *Shopkick, Inc. v. Novitaz, Inc.*, IPR2015-00279, Paper 7 at 26–30 (PTAB May 29, 2015)). According to Patent Owner, “because the Petition does no more than simply point to various independent portions in Wang and Chou without explaining what is to be modified or how, the Petition should be denied.” *Id.* at 32 (citing *Metalcraft of Mayville, Inc. v. Toro Co.*, 848 F. 3d 1358, 1367 (Fed. Cir. 2017)).

(iv) Available Reproduction Time

Patent Owner contends Wang’s variable “ T_{last} ” fails to teach an available reproduction time because, in those cases in which packets arrive out of order, the “time available for reproducing the content based on the content data stored in the storage device” will be different than the “time difference between the current time and the scheduled playout time of the last packet in the buffer.” Prelim. Resp. 36–37 (citing Ex. 2001 ¶¶ 81, 82, 88 (internal citations omitted)). Thus, Patent Owner argues “Wang does not disclose ‘an available reproduction time’ as claimed.” *Id.* at 37 (citing Ex. 2001 ¶ 82). Patent Owner further contends Wang’s T_{last} is equal to the playout time of the last packet from the current time and includes the time before the buffer playout begins and, therefore, is not the available reproduction time but can be something greater. *Id.* at 42 (citing Ex. 2001 ¶ 88 (internal citations omitted)).

c) Analysis

Having considered the parties’ respective arguments and the cited evidence, we agree with Patent Owner that Petitioner has not shown a reasonable likelihood that it would prevail on its allegations regarding claim 1 under Ground 2.

(i) Code Rate

First, at this preliminary stage, we are not persuaded by Petitioner’s contentions that Wang teaches [1d]’s code rate. *See* Pet. 62–65; *see also* Prelim. Resp. 28. The ’101 patent discloses “[t]he code rate represents the data amount (the data size, e.g., the number of bytes) of content data for reproducing content at constant speed (reproducing content at 1x speed) for a unit time (e.g., one second).” Ex. 1001, 7:7–11. In contrast, we agree with

Patent Owner that Wang’s “‘transmission rate’ is the number of packets that the sender sends per unit of time” and “refers to the rate of packet transmission, not to changes to the code allowing for distinct code rates as required by the Challenged Claims of the ’101 Patent.” Prelim. Resp. 28; *see also id.* at 39–41.

(ii) *Motivations to Combine*

Second, at this preliminary stage, we are not persuaded by Petitioner’s contentions that a POSITA would have been motivated to combine the teachings of Chou and Wang. Pet. 74. As argued by Patent Owner, “Wang and Chou are directed to different technologies—active encoding applications and transport-layer protocols,” (*see* Prelim. Resp. 30, 34–35), and Petitioner does not persuasively explain, for example, why the two methods would be combined into a single method rather than implemented independently in their respective transport and application layers.

(iii) *Scope of Wang’s Teaching vis-à-vis Limitation [1d]*

Petitioner states “[i]f [Patent Owner] argues Chou doesn’t teach [1d], Wang does” (Pet. 62), concluding “Wang teaches calculating a change in code rate based on both the remaining time before reproduction start time and an available reproduction time, as required by [1d]” (*id.* at 63). Apart from a bare cross-reference to Ground 1 (*see* Pet. 62 (“*See* Ground 1, [1d]”)), Petitioner does not make any reference to Chou for teaching any aspect of limitation [1d] in connection the combination of Ground 2 (*see generally id.* at 62–65). Furthermore, although contending that “Chou and Wang both disclose controlling *code rate* to control buffer duration/fullness to prevent buffer underflow” (*id.* at 72), Petitioner does not clearly indicate

that a POSITA would have had reason to combine Wang’s teaching of criteria used to maintain buffer fullness with Chou’s teaching of determining a code rate where the code rate “represents the data amount (the data size, e.g., the number of bytes) of content data for reproducing content at constant speed (reproducing content at 1x speed) for a unit time (e.g., one second)” (Ex. 1001, 7:7–11). Therefore, at this preliminary stage, we treat Petitioner’s Ground 2 as relying on Wang alone for teaching [1d].

(iv) *Available Reproduction Time*

Patent Owner contends that Wang’s variable “ T_{last} ” fails to teach an available reproduction time is based on those cases in which packets arrive out of order. *See* Prelim. Resp. 36–37. However, Patent Owner does not explain why, in other cases wherein, for example, the packets do arrive in order, “ T_{last} ” does teach an available reproduction time or why a POSITA would not have made appropriate adjustments to account for such cases. In an obviousness analysis, it is not necessary to find precise disclosure directed to the specific subject matter claimed because inferences and creative steps that a person of ordinary skill in the art would employ can be taken into account. *See KSR Int’l Co. v. Teleflex Inc.*, 550 U.S. 398, 418 (2007). In this regard, “[a] person of ordinary skill is also a person of ordinary creativity, not an automaton.” *Id.* at 421. Thus, although at this preliminary state of the proceeding, we do not find Patent Owner’s contention to be supported by the evidence, the parties will have the opportunity to develop the record on this issue further during trial. Furthermore and nonetheless, because Petitioner’s other allegations are insufficient for the reasons set forth *supra*, our ultimate conclusion regarding claim 1 is not affected.

d) Conclusion Regarding Claim 1

Accordingly, at this stage of the proceeding, we determine that Petitioner has not established a reasonable likelihood of prevailing on its assertion that claim 1 would have been obvious over Chou and Wang under Ground 2.

3. Independent Claims 11, 16, 21, 22, and 26–29

Petitioner refers back to its arguments for claim 1 for all limitations of claims 11, 16, 21, 22, and 26–29. Pet. 65. For the reasons discussed in Section III.F.2 above with respect to claim 1, we conclude that Petitioner additionally has not established a reasonable likelihood of prevailing with respect to claims 11, 16, 21, 22, and 26–29 under Ground 2.

4. Dependent Claims 2, 4, 5, 7, 12, 14, 15, 17, 18, 20, 23, and 25

For dependent claims 2, 4, 5, 7, 12, 14, 15, 17, 18, 20, 23, and 25, Petitioner argues the claims “are taught by *Chou* in view of *Wang* at least for the same reason as in Ground 1.” Pet. 65. For the reasons discussed in Section III.F.2 above with respect to claim 1, we conclude that Petitioner additionally has not established a reasonable likelihood of prevailing with respect to claims dependent claims 2, 4, 5, 7, 12, 14, 15, 17, 18, 20, 23, and 25 under Ground 2.

G. Obviousness of Claims 5, 7, and 15 over Chou and Nobuyoshi (Petitioner’s Ground 3)

For dependent claims 5, 7, and 15 Petitioner argues with citations to Nobuyoshi and Dr. Reader’s testimony that Nobuyoshi teaches each of the claims’ additional limitations. Pet. 65–69. Patent Owner does not provide any arguments specifically for any of the challenged dependent claims other

than contending that Nobuyoshi “does not disclose, teach, or suggest the elements of claim 1 of the other independent claims., but relies only on the arguments presented for the independent claims. Prelim. Resp. 44.

Based on the arguments presented and the evidence cited in the Petition, Petitioner shows a reasonable likelihood of prevailing on each of claims 5, 7, and 15 in its challenge based on the combination of Chou and Nobuyoshi.

IV. CONCLUSION

For the reasons above, Petitioner has shown that there is a reasonable likelihood it would prevail with respect to at least one of the claims challenged in the Petition. Thus, we institute trial on all asserted grounds and all challenged claims. *See* 37 C.F.R. § 42.108(a); *SAS Inst., Inc. v. Iancu*, 138 S. Ct. 1348, 1359–60 (2018); *AC Techs. S.A. v. Amazon.com, Inc.*, 912 F.3d 1358, 1364 (Fed. Cir. 2019) (“[I]f the Board institutes an IPR, it must . . . address all grounds of unpatentability raised by the petitioner.”).

V. ORDER

It is

ORDERED that, pursuant to 35 U.S.C. § 314(a), an *inter partes* review of claims 1, 2, 4, 5, 7, 11, 12, 14–18, 20–23, and 25–29 of the ’101 patent is instituted with respect to all the grounds set forth in the Petition; and

FURTHER ORDERED that pursuant to 35 U.S.C. § 314(c) and 37 C.F.R. § 42.4, *inter partes* review of the ’101 patent commences on the entry date of this Order, and the Board hereby gives notice of the institution of a trial.

IPR2023-01239
Patent 8,752,101 B2

For PETITIONER:

Scott Weidenfeller
Anupam Sharma
COVINGTON & BURLING LLP
sweidenfeller@cov.com
asharma@cov.com

Daniel Yannuzzi
Michael Hopkins
Darren Franklin
SHEPPARD, MULLIN, RICHTER & HAMPTON
dyannuzzi@sheppardmullin.com
mhopkins@sheppardmullin.com
dfranklin@sheppardmullin.com

For PATENT OWNER:

Eliot Williams
Robert Maier
Jennifer Tempesta
Michael Knierim
Nicholas Palmieri
BAKER BOTTS L.L.P.
eliot.williams@bakerbotts.com
robert.maier@bakerbotts.com
jennifer.tempesta@bakerbotts.com
michael.knierim@bakerbotts.com
nick.palmieri@bakerbotts.com