

UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE PATENT TRIAL AND APPEAL BOARD

PELOTON INTERACTIVE, INC.,

Petitioner,

v.

NEC CORPORATION,

Patent Owner.

Case No. IPR2023-01239

Patent 8,752,101

PATENT OWNER PRELIMINARY RESPONSE

LIST OF EXHIBITS	
Exhibit	Description
2001	Declaration of Daniel Schonfeld, dated December 5, 2023
2002	Curriculum Vitae of Dr. Daniel Schonfeld
2003	Peloton's Disclosure of Terms and Constructions
2004	H. Schulzrinne et al., RTP: A Transport Protocol for Real-Time Applications, RFC 3550, July 2003
2005	D. Schonfeld, "Video Communication Networks," (Invited Chapter), <i>Handbook of Image and Video Processing. Second Edition</i> . A. Bovik (ed.), Academic Press: San Diego, California, Chapter 9.3, pp. 1031-1064, 2005
2006	H.323: Packet-based multimedia communications systems, Nov. 1996
2007	Kurose, James F., and Keith W. Ross, <i>Computer Networking: A Top-down Approach</i> . 2017.
2008	Tanenbaum, Andrew S., and David Wetherall, <i>Computer Networks</i> . Prentice Hall, 2011
2009	H. Schulzrinne et al., Real-Time Streaming Protocol (RTSP), RFC 2326, 1998.
2010	S. Akhshabi et al., "An Experimental Evaluation of Rate-Adaption Algorithms in Adaptive Streaming over HTTP," <i>Proc. 2011 ACM Multimedia Systems Conf.</i>
2011	U.S. Patent No. 6,370,688 (Hejna)

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I. INTRODUCTION

The Board should exercise its discretion to deny this petition at least because Petitioner did not give it due attention, and neither should the board. The Petition is fraught with errors and mistakes, both trivial and substantive. *See, e.g.*, Pet., iii (listing multiple sections with the same numerals); iii, 18 (“steaming” instead of “streaming”); 1 (citing the wrong Wang reference); 32 (not identifying structure or function for alternative means-plus-function theory); 40 (same); 73 (not identifying what is allegedly to be combined); 74 (writing “I also understand the Supreme Court”).

Notably, as initially filed, the Petition relied on the **wrong** “Wang” reference used in the grounds. Pet., 1 (listing U.S. Patent No. 5,867,230 as EX1016); Paper 11 (Motion to Correct Petition); EX1039. According to the declaration of Mr. Hopkins, backup counsel for Petition who took the blame for this error, the references and documents cited in the petition were sent to support staff and filed without being checked by counsel of record. EX1039, ¶¶4-5; Paper 11. More significantly, Petitioner’s expert, Dr. Reader, has offered no explanation as to why the error was also included in his declaration or whether he had actually considered the “correct” reference. *See* EX1037. Accordingly, Dr. Reader’s testimony is unreliable. In light of these deficiencies, the Board should exercise its discretion under §314(a) to deny institution.

There are at least two additional reasons why the board should deny this Petition. **First**, Petitioner has failed to comply with 37 C.F.R. §§ 42.104(b)(3)-(4). Petitioner contends, in related district court 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. *See, e.g.*, Pet., 32, 40. Accordingly, the Petition is defective and should be denied for this reason alone.

Second, the Petition fails on the merits. The primary reference relied upon by Petitioner for all grounds, Chou (EX1004), does not disclose or render obvious at least the “available reproduction time” limitation. *See infra*, §IV.A.2. In fact, Chou expressly states that available reproduction time is **not** used to determine code rate and suggests that examining the actual buffer fullness is not necessary. *Id.*; EX1004, ¶19 (“[I]n the present system and process, it is **not** the actual fullness of the client buffer that is controlled[.]”) (emphasis added). In apparent recognition of this deficiency of Ground 1, Petitioner attempts to rely on a secondary reference in Ground 2—“Wang,” EX1016, identified now, after the motion to correct has been granted¹, as “U.S. Patent No 7,606,928” in Petitioner’s exhibit list (*see* Pet., 1)—to

¹ Petitioner emailed the Board to seek leave to file a motion to correct on August 28, 2023, **after** the one-year bar date of 35 U.S.C. § 315(b), stating that Petitioner had intended to rely on U.S. Pat. No. 7,606,928—a patent number that appears nowhere in the Petition and was not submitted as an exhibit. The motion has since

fill the hole in Chou.² But the alleged motivation to combine fails in light of Chou's express teaching away and technical differences between Chou and Wang. *Infra*, §IV.B.2. Moreover, even assuming a proper motivation to combine, the Petition's proposed combination still would not result in using available reproduction time to determine code rate as claimed. *Infra*, §§IV.B.2-3.

Lastly, the Board should exercise its discretion under §325(d) to deny institution because the prior art references are cumulative of prior art already analyzed by the Patent Office. *Infra*, §§V.A. In particular, Chou is cumulative of U.S. Patent No. 6,370,688 (Hejna), which was examined by the Patent Office during prosecution. EX1001, Cover. Moreover, Nobuyoshi is explicitly discussed within the specification of the '101 Patent and also was examined by the Patent Office during prosecution. *Id.*

II. BACKGROUND

A. Technical Background

At the time of the priority date of the '101 Patent, in November 2009, a number of problems existed in content streaming networks. EX2001, ¶27. There were multiple different approaches being pursued by numerous companies and

been granted and references herein to EX1016 refer to U.S. Pat. No. 7,606,928. See Paper 13.

² Petitioner also presents a third ground based on Nobuyoshi (EX1014) for dependent claims 5, 7, and 15, and thus fails for the same reasons as Ground 1 and 2.

research institution. *Id.* Indeed, the industry had not decided on a best solution to provide content to users. *Id.* For example, there was much debate whether methods based on existing streaming protocols should be deployed or whether new approaches such as adaptive streaming should be pursued. *Id.*

As an example, one approach to video communications was to download the entire video file and reproduce the video from the downloaded file, which is commonly referred to as video download. *Id.*, ¶28; EX2008, 713-714, (732-733)³. For instance, early forms of on-demand video delivery used a method where the video file needed to be downloaded and stored on a storage device in its entirety before it could be reproduced. *Id.* The disadvantage was that this required a subscriber to wait for the entire download to finish before watching the video. EX2001, ¶28; EX2008, 714, (733) (“Most customers do not want to wait an hour for their ‘video on demand.’”). Thus, this approach had very long startup times and had significant storage capacity requirements. EX2001, ¶28.

Another approach utilized transport stream protocols. *Id.*, ¶29; *See, e.g.*, EX2009. Transport stream protocols allowed for quick startup times but were prone to problems due to scaling and adaptability. EX2001, ¶29. That is, streaming protocols at the time of the invention did not scale easily to a large number of

³ The page numbers in parentheses correspond to the page number of the PDF of the corresponding exhibit if there is a difference between the PDF page number and the original page numbers.

subscribers because they required dedicated servers. *Id.* Accordingly, the streaming protocols were sensitive to variable network conditions and thus prone to freezing, resulting in poor image quality and various undesirable artifacts. *Id.*

Transport streaming applications required great communications and computing resources and were thus curtailed by computer system managers using firewalls, while also exploited by bad actors in denial-of-service attacks. *Id.*, ¶30; EX2009, 10 (“A firewall may need to understand the SETUP method to open a ‘hole’ for the UDP media stream.”). Progressive video was introduced as an approach to video streaming designed to circumvent firewalls by masking video streaming as simple web browsing. EX2001, ¶30; EX2007, 684, (708) (“The use of HTTP over TCP also allows the video to traverse firewalls and NATs more easily (which are often configured to block most UDP traffic but to allow most HTTP traffic).”). In this approach, the encoded video file is divided into small segments that are stored on a web server. EX2001, ¶30. The receiver then makes web requests for delivery of individual segments that are then decoded and reproduced for display by the receiver. EX2001, ¶30; EX2007, 148, (174) (“When a user wants to see the video, the client establishes a TCP connection with the server and issues an HTTP GET request for that URL.”). But progressive video suffered “a major shortcoming: All clients receive the same encoding of the video, despite the large variations in the

amount of bandwidth available to a client, both across different clients and also over time for the same client.” *Id.*

Progressive video served as an impetus to yet another approach to video streaming based on adaptive bitrate streaming. EX2001, ¶31; EX2007, 148 (174). In this approach, the video content was encoded at multiple bitrates and the encoded video stream was divided into multiple smaller segments, just like progressive video. *Id.* Individual video segments at various bitrates were selected by the receiver based on the network and buffer conditions and transmitted by the server to the receiver. *Id.* The ’101 Patent is directed to such adaptive bit rate streaming. EX2001, ¶31.

All of these methods had various advantages and disadvantages and had different hardware and software requirements. EX2001, ¶32. At the time, there were a number of considerations related to issues of network ownership, management, and availability, hardware and software requirements on content ingest and encoding, player hardware and software support, and overall system complexity. *Id.*; *see, e.g.*, EX2008, 526, (545) (“Memory was once expensive but prices have fallen dramatically.”). These concerns were exacerbated by the fact that new hardware (*e.g.*, set-top boxes, smartphones, laptops, tablets, etc.) was rapidly advancing and, as a result, each had different hardware and software constraints. EX2001, ¶32; *see, e.g.*, EX2008, 526, (545) (“When buffer space no longer limits the maximum flow, another bottleneck will appear: the carrying capacity of the

network.”). The optimal approach to video streaming was not clear as all these methods posed significant challenges. EX2001, ¶32.

Importantly, adaptive bitrate streaming approach was still in its infancy in 2009 (when the '101 Patent was filed), and it was not yet clear whether it would prevail as the dominant video delivery method in the industry. EX2001, ¶33; EX2010, Abstract (explaining that, in 2011, “Adaptive (video) streaming over HTTP [was then] gradually being adopted.”). Indeed, at the time of the priority date, the industry had yet to adopt or perfect the nuances of the adaptive bit rate approach as indicated by the paper published nearly two years after the priority date of the '101 Patent that “focus on the rate-adaption mechanisms of adaptive streaming.” EX2001, ¶33 (citing EX2010, Abstract).

Because of these challenges, and the nascent era of adaptive bitrate streaming, it was challenging to design a video streaming distribution system. EX2001, ¶34. Nonetheless, the inventors of the '101 Patent proposed a solution to stream “one content coded with any one code rate of a plurality of code rates different from each other,” as claimed. EX2001, ¶34 (citing EX1001, Claim 1).

B. The '101 Patent

The distribution system in the '101 Patent brings together numerous elements and methods previously unknown in the field of content streaming at the time of the invention to provide a better content distribution system. EX2001, ¶35. The claimed

invention allows server devices to stream content to many different user devices at the best possible quality and adapt to varying network conditions and the quality of the network infrastructure that services each of the devices, while accommodating their different capabilities and minimizing any perceptible video quality impairments. *Id.* Indeed, the specification of '101 Patent highlights multiple considerations of how software and hardware would need to be implemented in order to provide reliable adaptive bitrate streaming. *Id.* And the claims themselves make clear that the invention was directed to a unique approach related to adaptive bit rate streaming. EX1001, Claim 1 (“[T]he 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[.]”) (emphasis added); EX2001, ¶35.

The '101 Patent explains that the communication speed (*i.e.*, the amount of data that a reception device receives from a transmission device per unit time) varied depending on the status of use of a particular communication line that connected them, and that the communication line was most likely not in the transmitter or the receiver's control. EX1001, 1:54-58; EX2001, ¶36. In a case where the communication speed became very low, the reception device would not start reproduction of content at the reproduction start time. EX1001, 1:62-64; EX2001, ¶36. Nevertheless, the inventors of the '101 Patent set course to provide a solution

that could adapt to all of these constraints. EX1001, 2:21-25 (“Accordingly, an object of the present invention is to provide a distribution system capable of solving the abovementioned problems, ‘the code rate may be set to be extremely high’ and ‘the reception device may be unable to start reproduce content a set reproduction start time.’”); EX2001, ¶36.

To solve these problems, the ’101 Patent provides a distribution system that determines the code rate using a remaining time before reproduction start time, which is set as a time at which the reception device starts reproduction of the content from a present moment, and an available reproduction time, which is a time available for reproduction of the content based on the stored data. EX1001, 2:39-46; EX2001, ¶37. The transmission device is then able to change the code rate of the content data to be transmitted to the determined code rate in order to provide an enhanced content streaming system. EX1001, 2:47-49; EX2001, ¶37.

In this way, the inventors solved a major issue in the industry and provided a system that allowed reception devices to start the reproduction of content at set reproduction times while avoiding meaninglessly lowering the code rate (and thereby the quality of the media content), and thus provided an improved content streaming system that improved customer satisfaction. EX1001, 4:14-17; EX2001, ¶38.

C. Person of Ordinary Skill in the Art (“POSITA”)

For the purposes of this Patent Owner Preliminary Response only, Patent Owner applies Petitioner’s definition of POSITA. Pet., 14; EX2001, ¶¶13-18. Even applying that definition, however, the Petition should be denied.

III. THE PETITION SHOULD BE DENIED FOR FAILURE TO COMPLY WITH 37 C.F.R. §§ 42.104(b)(3)-(4)⁴

Petitioner contends, in the related district court litigation, that the terms “code rate determining unit” and “content transmitting unit”—one or more of which appears in challenged claims 1, 2, 4, 7, 16, 17-18, 20, 21, 22, 23-25, 26—are means-plus-function limitations subject to §112, ¶6. EX2003, 4-7. In the Petition, by contrast, Petitioner states that “all terms have their plain and ordinary meaning,” Pet., 17, and states in conclusory fashion that “[t]o the extent [1b] *might* be deemed a means-plus-function limitation, [1b] is still taught by *Chou*.” Pet., 29 (emphasis added); *see also* Pet., 32, 40, 46-48, 50. The Petition provides no further analysis; it does not identify any alleged function or structure from the specification much less how the construed claim would be met by Chou (or any other reference). Accordingly, the Petition is defective in violation of Rule 42.104(b)(3)-(4) and should be denied. *Orthopediatrics Corp. v. K2M, Inc.*, IPR2018-01548, Paper 9 at 10-11 (P.T.A.B. Mar. 1, 2019).

⁴ If instituted, Patent Owner reserves the right to address the merits of claim construction.

Rule 42.104(b)(3) requires that “[w]here the claim to be construed contains a means-plus-function ... limitation ..., 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[.]” 37 C.F.R. § 42.104(b)(3); *see also* Consolidated Trial Practice Guide (Nov. 2019), 45 (“Where claim language may be construed according to 35 U.S.C. § 112(f), a petitioner must provide a construction that includes both the claimed function and the specific portions of the specification that describe the structure, material, or acts corresponding to each function. ... A petitioner who chooses not to address construction under § 112(f) risks failing to satisfy the requirement of 37 C.F.R. § 42.104(b)(3).”) [hereinafter CTPG]. Rule 42.104(b)(4) requires that the Petition state “[h]ow the construed claim is unpatentable ..., [including] where each element of the claim is found in the prior art” 37 C.F.R. § 42.104(b)(4). The Petition fails in both respects.

For example, according to Petitioner in the district court, the structure corresponding to the “code rate determining unit” of claims 1, 2, 4, 22, 23, 25, and 26 is a “general purpose computer or microprocessor programmed to carry out the algorithm disclosed in the ‘101 Patent at 10:13-11:10.” EX2003, 4-5.⁵ Nowhere is

⁵ Notably, Petitioner is also arguing that that the term “the code rate determining unit” as it appears in claims 18 and 20, is indefinite. EX2003, 7. The Petition provides no analysis to explain this discrepancy. *See Lyft Inc. v. Rideapp, Inc.*, IPR2019-00671, Paper 12 at 15 (P.T.A.B. Aug. 12, 2019) (denying institution where claims were indefinite); *see also BlackBerry Corp. v. Mobilemedia Ideas*,

that structure identified in the Petition, in violation of Rule 42.104(b)(3). Moreover, the “algorithm” alleged by Petitioner in the district court at the ’101 Patent, 10:13-11:10, includes, for example, only equations (4) and (5):

$$B_n = (T_n - T_{n-1}) \cdot r_n / (t_n - t_{n-1}) \quad (4)$$

$$r_{n+1} = B_n \cdot (t_s - t_n) / (T_d - T_n) \quad (5)$$

EX1001, 10:32, 10:54. The Petition makes no effort in showing that Chou uses or otherwise follows these equations, in violation of Rule 42.104(b)(4).

As another example, according to Petitioner in district court, the “content transmitting unit” should be construed as a means-plus-function term but there is “[i]nsufficient structure to perform the claimed functions.” EX2003, 5-7. The Board has previously refused institution or terminated previously instituted petitions in similar circumstances. *See Lyft Inc.*, IPR2019-00671, Paper 12 at 15; *Blackberry Corp.*, IPR2013-00036, Paper 65 at 21 (terminating proceeding). The type of gamesmanship attempted by Petitioner is a violation of Rules 42.104(b)(3) and 42.104(b)(4) and is antithetical to the spirit of those rules as enunciated by the Trial Practice Guide: “[t]he rules governing the conduct of AIA trial proceedings were designed to promote fairness and efficiency.” CTPG, 35.

LLC, IPR2013-00036, Paper 65 at 21 (P.T.A.B. Mar. 7, 2014) (terminating proceeding where claims were indefinite).

Additionally, challenged claims 27, 28, and 29 each explicitly use the term “means,” which gives rise to the presumption of treatment under §112, ¶6. *Samsung Electronics Co., Ltd. v. Power2B Inc.*, IPR2022-01378, Paper 12 at 11-12 (P.T.A.B. Mar. 15, 2023) (denying institution explaining “Petitioner does not address the presumption and, more specifically, Petitioner does not provide any argument or evidence as to why the presumption is rebutted.”). The Petition fails to address this issue, in violation of Rules 42.104(b)(3)-(4).

Moreover, Petitioner also alleges, in district court, that other terms of the ’101 Patent should be construed in a way other than their plain and ordinary meaning. EX2003, 3. For example, Petitioner has provided explicit constructions for the terms:

- “content” (claims 1, 5, 11, 15, 16, 21, 22, 26);
- “content data” (claims 1, 11, 16, 21, 22, 26);
- “reproduction start time set as time at which the reception device starts reproduction of the content” (claims 1, 11, 16, 21, 26);
- “reproduction start time set as time to start reproduction of the content” (claim 22);
- “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” (claims 1, 11, 16, 21, 22, 26);

- “code rate” (claims 1, 2, 4, 11, 12, 14, 16, 18, 20-23, 25, 26).

Id. But the Petition includes no analysis or explanation of “[h]ow the construed claim [according to Peloton’s own construction] is unpatentable under the statutory grounds” or “where each element of the claim [according to Petitioner’s own construction] is found in the prior art[.]” 37 C.F.R. § 42.104(b)(4). Accordingly, Peloton’s Petition fails to comply with the Rules and should be denied. The only reason for Peloton’s inconsistencies and refusal to take a position regarding claim construction in its Petition is that Peloton hopes to keep its options open to be able to take different views for validity and infringement.

The facts of this case are indistinguishable from *Orthopediatrics*, where in the related district court litigation, petitioner (Ortho) argued that the limitations directed to grasping members should be construed as means-plus-function terms but failed to provide a proposed claim construction as required by 37 C.F.R. § 42.104(b)(3) in the related petition. *Orthopediatrics Corp.*, IPR2018-01548, Paper 9 at 10-11. The Board reasoned that petitioner “should have either provided reasons why these limitations are not governed by 35 U.S.C. § 112 ¶ 6, or [p]etitioner should have provided an explicit claim construction as required by our rules.” *Id.*, 10. In reaching its decision to deny institution, the Board explained that “[b]ecause of the unique circumstances of this proceeding, where [p]etitioner advocated for a different claim construction in the related district court litigation, we determine that

construction of the claim terms in dispute is necessary for the resolution of issues before us. Lacking such claim construction, the [p]etition fails to comply with 37 C.F.R. § 42.104(b)(3).” *Id.*, 10-11. The Petition in this case should be denied for the same reasons.

IV. THE PETITION FAILS ON THE MERITS

The Board should deny institution because Petitioner fails to show that it is more likely than not that at least one of the claims challenged in the Petition is unpatentable. 35 U.S.C. § 324(a); EX2001, ¶26.

Petitioner asserts obviousness (35 U.S.C. § 103) as grounds for invalidity but, as explained below, no single prior art reference cited in the Petition discloses all the claimed limitations in the challenged claims, and the combination of prior art references cited in the Petition fails to show that the “features of [the challenged claims] were *known prior art elements*.” *K/S HIMPP v. Hear-Wear Technologies, LLC*, 751 F. 3d 1362, 1365-66 (Fed. Cir. 2014) (emphasis added); *Personal Web Techs., LLC v. Apple*, 848 F.3d 987, 991 (Fed. Cir. 2017).

In addition to the prior art references failing to disclose all elements recited in the claims, the Petition is also defective for several other reasons. For example, the Petition fails to explain why a POSITA would be motivated to modify Chou alone and/or combine it with the other references. *Personal Web Techs. LLC*, 848 F.3d at 994 (“[A] clear, evidence-supported account of the contemplated workings of the

combination is a prerequisite” to concluding “that a relevant skilled artisan would have been motivated to make the combination and reasonably expect success in doing so.”). Additionally, the Petition fails to reconcile its proffered combinations with the fact that the primary reference, Chou, explicitly teaches away from combining the references that the Petition relies upon. *Chemours Co. FC, LLC v. Daikin Indus., Ltd.*, 4 F.4th 1370, 1376 (Fed. Cir. 2021), cert. denied, 142 S. Ct. 1418, 212 L. Ed. 2d 405 (2022) (finding no motivation to modify or combine when the primary reference taught away from the proffered modification).

For brevity, Patent Owner addresses only those arguments that are necessary for the Board to determine whether to institute trial at this stage. Patent Owner presents the arguments herein solely in the context of and for the purpose of responding to the arguments in the Petition as they are made by Petitioner and makes no admission or waiver with respect to arguments not addressed herein in the current or any related proceedings. Further, to avoid confusion and facilitate the Board’s review, the Patent Owner adopts the Petition’s labeling of claim elements of the ’101 Patent for this Response without accepting the substance of the Petition’s arguments or any substantive implications of such labeling.

Although the discussion herein is with respect to independent Claim 1, independent Claims 11, 16, 21, 26, 27, 28, and 29 recite substantially similar elements as Claim 1 and therefore the analysis applies to each of the challenged

independent Claims. EX2001, §§V.A.5, V.B.6. Moreover, Claims 2, 4, 5, 7, 12, 14, 15, 17, 18, 20, 23, and 25 depend, directly or indirectly, from a respective independent Claim 1, 11, 16, or 21 and therefore the Petition fails to render these claims obvious based at least on their dependency. EX2001, §§V.A.4-5, V.B.5-6.

A. Petitioner fails to show obviousness over Chou (Ground 1)

Petitioner asserts Claim 1 of the '101 Patent to be obvious by U.S. Patent Application Pub. No. 2006/0143678 A1 (“Chou”) (EX1004). Pet., §IX.A.1⁶; EX2001, ¶41. Ground 1 fails because Chou does not disclose either the “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” or the “code rate determining unit for determining the code rates based on ... [the] available reproduction time” as claimed in Claim element [1d]. EX2001, ¶41.

Chou expressly states that it is not the actual buffer fullness that is ever examined, calculated, or controlled. *Id.*, ¶42; EX1004, ¶19 (“[I]t is **not** the actual fullness of the client buffer that is controlled[.]”) (emphasis added). The Petition relies only on misleading citations from Chou (while ignoring the express disclosure that the actual buffer fullness is not actually controlled) and conclusory expert testimony to provide the “available reproduction time” limitation. Pet., 38-39;

⁶ The Petition appears to have an error that causes §IX.A.1 to appear more than once. To avoid confusion, reference is made to page numbers of the Petition and not the section numerals.

EX2001, ¶42. This is insufficient and for this reason alone Ground 1 fails. *See* CTPG, 36 (“Expert testimony ... cannot take the place of a disclosure in a prior art reference, when that disclosure is required as part of the unpatentability analysis. ... [E]xpert testimony may explain ‘patents and printed publications,’ but is not a substitute for disclosure in a prior art reference itself.”).

Given Chou’s express disclosure that it does not actually control the actual buffer fullness, a POSITA would not be motivated to modify Chou to actually examine, determine, or control the actual buffer fullness of the client buffer. EX2001, ¶42. Notably, the Petition does not attempt to allege that a POSITA would be so motivated.

1. Overview of Chou

Chou describes using a theory of optimal linear quadratic control in choosing the bit rate of transmitted data between a server and a client. EX1004, Abstract; EX2001, ¶44. Chou does not disclose that the bit rate determined based on an available reproduction time. EX2001, ¶44. To the contrary, Chou expressly states 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.” EX1004, ¶19 (emphasis added); EX2001, ¶44.

Chou discloses a system where active encoding is performed and therefore requires an encoder buffer on the server and a decoder buffer on the client. EX1004, ¶60 (“[A]n encoder buffer 206 is required between the encoder 200 and the network 204 and a decoder buffer 208 is required between the network 204 and the decoder 202, as illustrated in FIG. 2.”); EX2001, ¶45. The issue that arises in Chou is that the encoder buffer 206 must never overflow or frames will be lost (and therefore never transmitted) and must never underfill (which would prevent any transmission). EX2001, ¶45. Accordingly, Chou’s mathematical algorithm is premised on a “leaky bucket model” that models the encoder buffer based on frames being loaded therein (*e.g.*, at a first rate) and frames drained therefrom (*e.g.*, at a second rate) and sent to the client. *Id.*; EX1004, ¶¶60-66. The encoder buffer 206 is the reason that Chou implements the “leaky bucket model,” which bounds the determination of the bit rate. EX1004, ¶70 (“By taking the leaky bucket model into account, it is possible to establish a control that allows the instantaneous coding bit rate to fluctuate naturally according to the encoding complexity of the content, within previously established bounds for a given average coding bit rate.”); EX2001, ¶45.

The control solution disclosed by Chou, sends “leaky bucket parameters” to the client to be used in determining an “optimal bit rate.” EX1004, ¶109; EX2001, ¶46. Chou discloses 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” with reference

to Figure 5, which the Petition alleges is the “available reproduction time.” EX1004, ¶67; EX2001, ¶46; Pet., 39-40. Yet, as discussed in greater detail below, this is a theoretical value; Chou does not disclose calculating it or much less using it to determine code rate. *Infra*, §§IV.A.2-3; EX2001 ¶46.

Moreover, even if the “gap between a frame’s arrival time and its playback deadline” is the available reproduction time, it is not necessarily a “time available for reproducing the content data stored in the storage device of the reception device” as required by Claim 1. EX1004, ¶67; EX2001, ¶47. Since Chou does not disclose that this value is determined, logically, Chou does not disclose that the code rate is determined based on such a value. EX2001, ¶48.

2. Chou does not teach “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” (claim element [1d])

Element [1d] recites, in part, “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.” EX2001, ¶49. Chou does not disclose this limitation. EX2001, ¶¶49-53.

The Petition discusses this element at §IX.A.1.c and alleges that “Chou teaches controlling buffer duration to a desired amount.” Pet., 38. Notably, the Petition only cites an expert declaration in support. *Id.* (citing EX1006, ¶150); EX2001, ¶50. Yet, the cited portion of the expert declaration cherry-picks a citation

from paragraph 19 of Chou to reach the conclusion that “Chou examines the current buffer duration” and ignores the portion from that paragraph where Chou expressly states that is **not** the actual fullness of the buffer that is controlled. EX1006, ¶150; EX2001, ¶50. Accordingly, the expert declaration offers no more than conclusory statements that are directly in conflict with the disclosure of Chou and should be given little weight. *Xerox Corp. v. Bytemark, Inc.*, No. IPR2022-00624, Paper No. 12 (P.T.A.B. Feb. 10, 2023) (Vidal, Dir.) (explaining that the Board was “correct in giving little weight” to the expert testimony because the “declaration merely offered conclusory assertions without underlying factual support and repeated, *verbatim*, [Xerox’s] conclusory arguments.”) (emphasis in original); EX2001, ¶50.

Moreover, even if the Petition’s conclusion (that is completely unsupported and, in fact, contradicted by Chou itself) were accepted to be true, it does not go far enough; the 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.” Pet., 38-39; EX2001, ¶51 (citing EX1001, Claim 1).

The Petition points to portions of the specification that merely describe a relationship between a “playback time” of a frame and the “arrival time” of that frame and generally states that the “**gap** [in the demonstrative figure] between a frame’s arrival time and its playback deadline is the client buffer duration at the time

of the frame arrival.” Pet., 40 (citing EX1004, ¶67). Nowhere 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). EX2001, ¶51. Yet, even if it were, 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.* That is, 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.* Thus, even if the “gap” was disclosed to be examined, calculated, or controlled by Chou, it would still not be the claimed “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 required by Claim 1. *Id.*

In an attempt to remedy this deficiency, the Petition relies only on expert testimony for the allegation that the difference in the playback deadline and arrival time 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.” Pet., 38-40 (citing EX1006, ¶¶150-153); EX2001, ¶52. Yet, the declaration is devoid of any reasoning that could support a finding that Chou

discloses the available reproduction time as claimed either explicitly or inherently. *Par Pharm., Inc. v. TWi Pharm., Inc.*, 773 F.3d 1186, 1195-96 (Fed. Cir. 2014) (noting that “[a] party must ... meet a high standard in order to rely on inherency to establish the existence of a claim limitation in the prior art in an obviousness analysis[.]”); EX2001, ¶52.

Accordingly, Chou fails to disclose “an available reproduction time” as claimed. EX2001, ¶53.

3. Chou does not teach “determining the code rate based on ... an available reproduction time” (claim element [1d])

Element [1d] recites, in part, “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.” Chou does not disclose this limitation. EX2001, ¶54.

The Petition also discusses this element in §IX.A.1.c and is deficient for at least the reasons described with reference to the “available reproduction time” above. Pet., 38-40; EX2001, ¶55. In particular, since Chou fails to disclose “an available reproduction time,” it also fails to disclose “determining the code rate based on” available reproduction time. EX2001, ¶55.

To support its allegation that Chou discloses this element, the Petition states “[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).” Pet., 39; EX2001, ¶56. This conclusion is unsupported by the record evidence. EX2001, ¶56. The Petition quotes paragraph 19 of Chou as stating that “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.” Pet., 38-39 (quoting EX1004, ¶19); EX2001, ¶56. Yet, in that *same* paragraph, Chou expressly states “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.” EX2001, ¶56 (citing EX1004, ¶19) (emphasis added). The Petition fails to reconcile this admission from Chou while alleging that Chou discloses “determining a code rate ... based on ... the available reproduction time.” EX2001, ¶56. Indeed, Chou expressly states that it does not teach the elements that the Petition is alleging it does.

The expert testimony cited by Petitioner does not remedy these deficiencies as it simply relies on conclusory assertions without any rational underpinning that could reconcile Chou’s statements in the same paragraph in which the declaration and Petition cite. See EX1006, ¶¶149-150; EX2001, ¶57. Indeed, 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. *Trivascular, Inc. v.*

Samuels, 812 F.3d 1056, 1068 (Fed. Cir. 2016) (finding no motivation to modify the prior art where doing so “would destroy the basic objective” of the prior art); EX2001, ¶57. Because there is no motivation to modify Chou as alleged in the Petition, institution should be denied because Petition fails to show the claim 1 is obvious in view of Chou. *Johns Manville Corp. v. Knauf Insulation, Inc.*, IPR2018-00827, Paper 9 at 20 (P.T.A.B. Oct. 16, 2018) (denying institution where the “reasons for such modifications, and whether there would be a reasonable expectation of success are not adequately supported.”); EX2001, ¶58.

For the other independent claims, the Petition merely cites back to claim 1. Pet., 50-61; EX2001, §V.A.5. The remaining Challenged Claims depend from one of the independent Challenged Claims. EX2001, §§V.A.4-5. Thus, the Petition fails to show that it is more likely than not that any of the claims are unpatentable in view of Chou. EX2001, ¶58.

B. Petitioner fails to show obviousness over Chou in view of Wang (Ground 2)

1. Overview of Wang

Wang is directed to embodiments deploying real-time transport protocol (RTP). EX1016, Abstract; EX2001, ¶64. As background, RTP is a transport-layer protocol (typically running over user datagram protocol (UDP) or transport control protocol (TCP) that send messages between devices over Internet protocol (IP) networks) and is commonly used for streaming applications such as, for example,

voice-over-IP (VoIP). EX2001, ¶64; EX2004; *see also* EX2005. RTP streams consist of packets that carry media content (*e.g.*, audio and video), each having a sequence number and a timestamp. EX2001, ¶64; EX2004, 4. The sequence number is a binary number that allows the receiver to reorder the packets upon arrival and thus accommodate out-of-order delivery of packets. EX2001, ¶64; EX2004, 4-6, 14. The timestamp allows the receiver to present the packets in the appropriate order to the media player for decoding and display as well as to synchronize multiple media streams such as, for example, audio and video streams. EX2001, ¶64; EX2004, 14-16. RTP is used in conjunction with real-time transport control protocol (RTCP), which is used to monitor transmission quality parameters by having the receiver send periodic reports containing statistics and control information regarding the media stream carried by the RTP (*e.g.*, packet count, packet loss, packet delay variation, round-trip delay, etc.). EX2001, ¶64; EX2005, 40. RTCP reports can be used by the sender to improve the media streaming quality including the delay and jitter of the media stream as well as multiple media stream synchronization. EX2001, ¶64; EX2005, 40-46.

Wang discloses a modification of RTCP packets that includes “receiver buffer information.” EX1016, 4:64-67; EX2001, ¶65. The new RTCP packet proposed by Wang includes information that is indicative of any sequence number of a packet within the receiver’s buffer and the time difference between the current time and the

scheduled playout time of that packet. EX1016, Abstract; EX2001, ¶65. Wang then suggests that this information can be used to calculate the current actual receiver buffer fullness level by calculating the time difference between the current time and the scheduled playout time of the last packet within the receiver buffer. EX1016, 3:48-55; EX2001, ¶65. Wang discloses that this is necessary because in the prior art, “there are no mechanisms to prevent the incorrect assumptions from happening and to eliminate the difference between the actual fullness level and the server assumed fullness level in the receiver buffer.” EX1016, 2:4-7; EX2001, ¶65. In particular, Wang describes the problem that “when the server executes the rate adaptation operations relying on the assumed receiver buffer fullness level, underflow or overflow in the receiver buffer may occur.” EX1016, 1:67-2:3; EX2001, ¶65.

It is important to note that RTP/RTCP is a transport-layer protocol and is thus assumed to operate independently of application-layer systems such as media encoders and decoders.⁷ EX2001, ¶66. Transport-layer protocols are distinct from

⁷ RTP packets are often prepared at the application layer for delivery by transport-layer protocols such as UDP and TCP in a mechanism that is sometimes referred to as application-layer framing because the application (as opposed to the protocol stack in the operating system) is cognizant of the semantics required to segment the data into packets. Nonetheless, the RTP/RTCP packets are transport-layer protocols and network protocol design practices based on the OSI Reference Model (such as the popular TCP/IP model) mandate that the protocols and applications at each layer operate independently while only providing interfaces to

higher-layer applications provided by coding standards (*e.g.*, H.263, H.264) that designate the coding schema of the underlying data carried by RTP packets. *See, e.g.*, EX2006, 295, (313); EX2001, ¶66.

As the Petition acknowledges, “Wang discloses adjusting ‘the transmission rate and/or nominal playout rate ... to maintain the receive[r] buffer fullness level[.]’” Pet., 62 (citing EX1016, 7:13-18); EX2001, ¶67. The “transmission rate” is the number of packets that the sender sends per unit of time. EX2001, ¶67. The transmission rate therefore 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.* The “nominal playout rate” is the rate the receiver reproduced the content per unit of time. *Id.* The nominal playout rate therefore refers to the rate of packet reproduction at the receiver and is unrelated to changes to the code allowing for distinct code rates as required by the Challenged Claims of the ’101 Patent. *Id.* Neither the transmission nor playback rates suggest determining or changing **a code rate** of the underlying data carried by RTP packets. *Id.*

As stated above, the new RTCP packet proposed by Wang includes the time difference between the current time and the scheduled playout time of that packet, which Wang suggests can be used to calculate the current actual receiver buffer

other layers to allow for efficiency and modularity in network system design. EX2001, n.3.

fullness level by calculating the time difference between the current time and the scheduled playout time of the last packet within the receiver buffer. EX1016, 3:48-55; EX2001, ¶68. However, Wang fails to teach “an available reproduction time” because the calculated time difference would not be “an available reproduction time, which is a time available for reproducing content” as required by Claim 1, as the Petition itself demonstrates (*See infra*, §IV.B.3) and for similar reasons described with reference to the “gap” in Chou (*See supra*, §IV.A.2). EX2001, ¶68. In particular, simply knowing the “time difference between the current time and the scheduled playout time of the last packet within the receiver buffer” does not guarantee that there is sufficient “time available for reproducing content based on the content data stored in the storage device of the reception device” in that time difference. EX2001, ¶68. Nor does knowing the “time difference between the current time and the scheduled playout time of the last packet within the receiver buffer” preclude the possibility that the “time available for reproducing the content data stored in the storage device of the reception device” may exceed that time difference. EX2001, ¶68.

Accordingly, Wang offers no solution that is analogous to determining a bitrate at all much less via using a remaining time and an available reproduction time that is based on the underlying content data in the storage device of the receiver. EX2001, ¶69.

2. The Petition’s arguments for motivations to combine fail because they are conclusory and change the principle of operation of the underlying references.

The Petition discusses the alleged motivation to combine Chou (directed to active encoding) and Wang (directed to a transport-layer streaming protocol) in §IX.D.1, but a POSITA would not be motivated to combine the two references because (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 (which it does not); and (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. Pet., 68-75; EX2001, ¶70; EX2006, 295 (depicting encoding standards isolated from RTP in network stack).

In general, the Petition discusses only abstractions of Chou and Wang to conclude that they both “manage buffer duration/fullness (based on time) in order to prevent buffer underflow[.]” EX2001, ¶71 (citing Pet., 69). The Petition then concludes Chou and Wang “both measure similar buffer characteristics to the ’101 Patent.[.]” EX2001, ¶71 (citing Pet., 70). But the Petition provides no rational underpinning for these conclusions and does not discuss how these conclusions

would provide motivation to a POSITA. EX2001, ¶71. The Petition then continues on to allege that Chou and Wang “both disclose controlling [the] code rate to control buffer duration/fullness to prevent buffer underflow” and that a “POSITA would have been motivated” to combine them. *Id.* (citing Pet., 72-73). But the Petition does not explain what the proposed modifications would be, why, or how a POSITA could combine them. EX2001, ¶71. Contrary to these unsupported conclusions, a POSITA would not and could not combine Chou and Wang. *Id.*

From the Petition itself, it is not clear what element from Wang Petitioner is alleging could or should be incorporated into Chou. EX2001, ¶72. For example, 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]. Pet., §IX.D.1; EX2001, ¶72. As such, the Petition fails to articulate what combination it is proposing and is therefore deficient. *Shopkick, Inc. v. Novitaz, Inc.*, IPR2015-00279, Paper 7, slip op. at 26–30 (P.T.A.B. May 29, 2015) (denying institution and explaining “conclusory labels do not substitute for a fact-based analysis ... **establishing what is being modified** and **why**, based on the differences between the prior art and the claimed invention, it would have been obvious to a person of ordinary skill to make the modification.”); EX2001, ¶72.

Moreover, the Petition makes generalized statements of the elements in Chou and Wang that attempt to improperly use the '101 Patent as a roadmap to establish a motivation to combine. EX2001, ¶73. In particular, the Petition alleges that “Chou and Wang both measure similar buffer characteristics to the '101 Patent” and “Chou and Wang both disclose controlling code rate to control buffer duration/fullness to prevent buffer underflow[.]” *Id.* (citing Pet., §§IX.D.1.b-c). But these general statements about alleged features from two different references is not sufficient to show how (or why) a POSITA would have been motivated to combine these references. EX2001, ¶73. To the contrary, because according to Petitioner both references allegedly disclose the same elements, a POSITA would not have been motivated to combine these references at all. *Id.* Accordingly, 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. *Metalcraft of Mayville, Inc. v. Toro Co.*, 848 F. 3d 1358, 1367 (Fed. Cir. 2017) (“Without any explanation as to how or why the references would be combined to arrive at the claimed invention, we are left with only hindsight bias that *KSR* warns against.”) (citing *KSR Int’l Co. v. Teleflex Inc.*, 550 U.S. 398, 427 (2007)).

Regardless of the high-level characterizations of the references made in the Petition that fail to point out what elements Petitioner suggests should be combined, Patent Owner will assume that the Petition’s lone recitation that “a POSITA would

have been motivated to use the buffer characteristic measurements disclosed in Wang as a basis for Chou to determine whether, and how much of, a code rate change is required” means that the Petition is arguing that Chou fails to disclose “a remaining time” and “an available reproduction time” as recited in Claim Element [1d] after the word “determining” and is instead relying on Wang for these elements. EX2001, ¶74 (citing Pet., 74-75). But, even if this is the case, the Petition does not support such a conclusion because it fails to articulate beyond conclusory statements *how* and *why* the references would be combined or explain that a POSITA would have a reasonable expectation of success in doing so. *Apotex Inc. v. Wyeth LLC*, IPR2014-00115, Paper 94, slip op. at 11 (P.T.A.B. Apr. 20, 2015) (quoting *Procter & Gamble Co. v. Teva Pharms. USA, Inc.*, 566 F.3d 989, 994 (Fed. Cir. 2009) (“A party that petitions the Board for a determination of obviousness must show that a skilled artisan would have been motivated to combine the teachings of the prior art references to achieve the claimed invention, and that the skilled artisan would have had a reasonable expectation of success in doing so.”) (internal citations omitted)); EX2001, ¶74.

First, the Petition fails to explain how a POSITA would have substituted or supplemented the proposed “linear quadratic formula” disclosed by Chou (which specifically proclaims that “it is not the actual fullness of the client buffer that is controlled”) with the elements from Wang. EX2001, ¶75 (citing EX1004, ¶19). To

the contrary, the “linear quadratic formula” that utilizes the “leaky bucket model” would not (and could not) accept the elements of Wang without substantial changes. EX2001, ¶75. That is, because Chou discloses that a variable that represents the actual buffer fullness is never determined or utilized, it is unclear how the algorithm could operate if such variable were now introduced. *Id.* The Petition nor the expert declaration provide an explanation for this. *Id.* Indeed, modifying the algorithm of Chou in such a way could not be accomplished without undue experimentation. *Id.* Moreover, by substituting the alleged elements from Wang into Chou, the entire purported novelty of Chou would be lost because Chou would now need to control the buffer fullness level when it expressly taught that “it is not the actual fullness of the client buffer that is controlled” by the “linear quadratic formula.” *Id.* (citing EX1004, ¶19). Accordingly, a POSITA would not be motivated to change Chou to control the buffer fullness level. EX2001, ¶76.

The Petition simply fails to reason how the references could be combined with any reasonable expectation of success. *Id.* As discussed above, such a combination would rest on a modification to the disclosed algorithm of Chou that would change the principle of operation of Chou and not be possible without significant effort and experimentation. *Id.* Therefore, the Petition should be denied. *See Cook Grp. Inc. v. Bos. Sci. Scimed, Inc.*, 809 F. App’x 990, 1001 (Fed. Cir. 2020) (affirming the Board’s finding of nonobviousness and holding that “where the motivation to

combine *rests on a modification alleged to improve the primary reference* ... the Board may consider whether the modification renders the reference inoperable for its intended function in deciding whether a [POSITA] would have a motivation to combine the references, even if that function is not a feature of the claimed device at issue.”) (emphasis added).

Second, the Petition fails to articulate a reason *why* a POSITA would combine the prior art references. EX2001, ¶77. That is, the Petition fails to reconcile Chou’s statements saying that it is *not* the actual buffer fullness that is controlled with its allegation that a POSITA would want to utilize the actual buffer fullness. *Id.* Moreover, the Petition fails to reconcile the fact that Wang is not directed to an encoding scheme that would allow for a code rate to be selected and changed. *Id.*, ¶78. That is, Wang is directed to a transport-layer streaming protocol that resides in a different network layer than the active coding application techniques disclosed by Chou and the Petition fails to explain why a POSITA would have combined them. *Id.* This is a particularly problematic deficiency because Wang does not disclose, teach, or even suggest that the code rate of the underlying data is of any concern. *Id.* Instead, Wang suggests only adjusting the transmission rate, which is either going to slow down or speed up the number of packets transmitted over a period of time and not change the code rate of the underlying content. *Id.*

Accordingly, Petitioner fails to show that claim 1 of the '101 Patent is obvious over a combination of Chou and Wang. *Id.*, ¶79.

3. Wang does not teach “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” (Claim Element [1d])

Element [1d] recites, in part, “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.” Chou does not disclose this element. EX2001, ¶80.

The Petition maps Wang’s disclosure of the variable “Tlast,” which is the “time difference between the current time and the scheduled playout time” of the last packet in the buffer, to an “available reproduction time.” *Id.*, ¶81 (citing Pet., 62 (internal citations omitted)). That is, the value of the time difference between the current time and the scheduled playout time of the last packet in the buffer is not necessarily an available reproduction time that “is a time for reproducing the content.” EX2001, ¶81. For example, if the current last packet has arrived before earlier packets in the bitstream have arrived, the “time available for reproducing the content based on the content data stored in the storage device of the reception device” will be smaller than the “time difference between the current time and the scheduled playout time of the last packet in the buffer.” *Id.* In other words, since RTP does not require that packets arrive in order, some may be lost, or some may arrive in a different order than the order they are supposed to be played back. *Id.*

As a result, if the buffer has received a packet that is the last packet and calculates the time difference from the present moment to the playout time of that packet, there will be no content that is reproduced until that packet is scheduled to start to play. Similarly, if the current last packet has arrived after other packets in the bitstream have arrived, the “time available for reproducing the content based on the content data stored in the storage device of the reception device” will be larger than the “time difference between the current time and the scheduled playout time of the last packet in the buffer.” *Id.* Further, the “time difference between the current time and the scheduled playout time of the last packet in the buffer” is only transmitted during periodic RTCP reports in the modified RTCP protocol of Wang and therefore will not represent “a time available for reproducing the content based on the content data stored in the storage device of the reception device” as a result of transmission delay. *Id.* Moreover, as explained in greater detail below, the Petition itself demonstrates why Tlast is not the “available reproduction time.” *See infra*, §IV.B.4; EX2001, ¶¶81, 88. For these reasons, the “time difference between the current time and the scheduled playout time of the last packet in the buffer” is not “an available reproduction time, which is a time for reproducing the content based on the data stored in the storage device,” as required by Claim 1. EX2001, ¶81.

Accordingly, Wang does not disclose “an available reproduction time” as claimed. *Id.*, ¶82.

4. Wang does not teach “determining the code rate based on a remaining time before reproduction start time... and based on an available reproduction time” (claim element [1d])

Element [1d] recites, in part, “a code rate determining unit for determining the code rate based on a remaining time before reproduction start time... based on an available reproduction time.” EX2001, ¶83. Petitioner identifies Wang generally as disclosing this element. *Id.*; Pet., §IX.B.1. Wang does not disclose such element. EX2001, ¶83.

First, the Petition is deficient in its support and reasoning. *Id.*, ¶84. The Petition maps Wang’s disclosure of the variable “Tx,” which is the “time difference between the current time and the scheduled playout time” of packet “x” to the “remaining time” of Claim 1. *Id.*; Pet., 62. The Petition also maps that same variable “Tlast”, when packet “x” corresponds to the last packet in the buffer, to the “available reproduction time.” *Id.*; Pet., 63. The Petition then cites Wang as allegedly disclosing “adjusting ‘the transmission rate and/or the nominal playout rate of the different media to maintain the receive[r] buffer.’” EX2001, ¶84 (citing Pet., 62 (quoting EX1016, 7:13-20)). As a threshold matter, the variable “Tlast” is not “an available reproduction time” for the reasons stated above and thus Wang cannot disclose that anything is determined based on “an available reproduction time.” See *supra*, §IV.B.3; EX2001, ¶¶84, 88.

Second, the Petition conclusory alleges that Wang discloses a “code rate determining unit for determining the code rate.” Pet., §IX.B.1; EX2001, ¶85. Wang does not disclose such an element. EX2001, ¶85. The Petition repeatedly states that Wang discloses adjusting the “transmission rate” or the “nominal playout rate.” Pet., 62-65; EX2001, ¶85. But these rates are not “code rate[s]” as recited in Claim 1. EX2001, ¶85. Instead, the “transmission rate” 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.* The nominal playout rate refers to the rate of packet reproduction at the receiver and is unrelated to changes to the code allowing for distinct code rates as required by the Challenged Claims of the ’101 Patent. *Id.* Neither the transmission nor playback rates suggest determining or changing a code rate of the underlying data carried by RTP packets. *Id.*

As discussed above, Wang discloses that the invention is used in conjunction with an RTP media stream. EX1016, 2:50-53; EX2001, ¶86. RTP is a transport-layer protocol that carries media stream segments in packets over transport protocols such as UDP or TCP. EX2001, ¶86. Media coding is performed by higher-level application systems (*i.e.*, encoder) and a POSITA would thus not have understood the “transmission rate” or the “nominal playout rate” to have any determination of the code rate of the underlying media content. *Id.* The Petition cites a portion of Wang for this allegation that states, in full, “[f]or example, the server can change 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.” *Id.* (citing Pet., 63 (quoting EX1016, 6:31-35)). Yet, this does not disclose that a code rate of the underlying data is determined because it only discusses the *transmission* characteristics and not the characteristics of the *data* (e.g., code rate) that is being transmitted. In fact, to the extent that the “designated [transmission] rate” refers to the code rate of the bitstream, this portion of Wang specifically teaches that the code rate remains unchanged and it is only the transmission rate that is adjusted. EX2001, ¶86. Notably, Petitioner relies on its expert to fill this gap. *Id.*; Pet., 63 (citing EX1006, ¶253). Yet, the Reader Declaration does no more than allege generally that Wang discloses “changing the transmission characteristic” and that “[t]hese transmission characteristics include changing the code rate.” EX2001, ¶86 (citing EX1006, ¶253). This conclusory statement is unsupported. EX2001, ¶86. Petitioner’s attempt to extrapolate the teachings of Wang are unfounded and not applicable to the general transport-layer protocol transmission that Wang discusses. *Id.* Wang itself discloses that the variable Tlast is intended to be used to cause changes to the transmission rate or the nominal playout rate, or to “synchronize” a clock of a remote camera live streaming to a clock receiving the live stream at the studio. *Id.*; EX1016, 7:50-55. Wang never suggests that a code rate of the media content can be changed, much less determined.

EX2001, ¶86. Accordingly, Wang fails to disclose a “code rate determining unit for determining the code rate.” *Id.*

The Petition also presents a different theory via a hypothetical situation created by Petitioner. *Id.*, ¶87; Pet., 64-65. This theory only includes two citations to the Wang reference and the remainder of the theory either includes no citation or only cites to the expert declaration. EX2001, ¶87. The entire theory is conjecture made up by Petitioner and its expert. *Id.* Even if it draws support for some of its assumptions from the specification, the surrounding assumptions make the entire hypothetical scenario nonsensical. *Id.* For example, Petitioner argues that “‘Tfirst’, which corresponds to ‘the time difference between the current time and the scheduled playout time of’ the first packet” can be mapped to the “remaining time” of Claim 1 to determine a code rate in a device that has yet to begin playback. *Id.* (citing Pet., 64). Yet, four sentences later, the Petition instructs the reader to “assume that playback is set to begin when eight packets are received in the buffer” without ever explaining how “Tfirst” could be calculated if the beginning of the playback for the first packet depends on having already received eight packets. *Id.* “Tfirst” could not possibly be calculated in this scenario because “Tfirst” corresponds to playout time (*e.g.*, end of playback) of the first packet when that playout time is unknown until eight packets have been received at the buffer. *Id.* Thus, the assumptions are

not tied to a real situation, and Petitioner is merely attempting to add disclosure to the Wang reference.

Nonetheless, accepting the assumptions presented by the hypothetical, the Wang reference itself contradicts the conclusions made in the Petition and demonstrates why Tlast is **not** the claimed “available reproduction time.” *Id.*, ¶88. For example, the Petition states that “Wang teaches that ‘the current actual receiver buffer fullness level’ can be calculated, which would be calculated to be five seconds (i.e., five packets in the buffer at one second of playback time each)[.]” but this is not true. *Id.* (citing Pet., 64-65). Wang discloses that Tlast would be equal to the playout time of the last packet from the current time. EX2001, ¶88 (citing Pet., 63 (citing Ex. 1016, 5:20-24, 5:35-37, 5:57-59)). Thus, in the hypothetical given, if the playback of the first packet (which the Petition asks us to assume) begins three seconds from now, and there are five packets in the buffer (which the Petition again asks us to assume), the time calculated for playout of the last packet (i.e., packet number five) would be **eight** seconds (i.e., five seconds of buffer time plus three seconds before buffer playout begins) and **not five** seconds as the Petition alleges. Pet., 64-65; EX2001, ¶88. This is exactly the issue highlighted above regarding Tlast – it would produce a value that is not representative of the time available for reproducing the content. EX2001, ¶88; *see supra*, §IV.B.3. Indeed, as Petitioner’s **own** hypothetical proves, Tlast is not the “available reproduction time.” EX2001,

¶88. As such, Wang does not disclose “determining a code rate” based on an “available reproduction time,” as required by Claim 1. *Id.*

Accordingly, not only does the hypothetical example provided in the Petition not remedy Wang’s deficiencies described above, it demonstrates why Wang does not disclose these elements. EX2001, ¶89.

As such, Wang fails to disclose Claim Element [1d]. EX2001, ¶88.

C. Petitioner fails to show obviousness over Chou in view of Nobuyoshi (Ground 3)

1. Overview of Nobuyoshi

Nobuyoshi is a Japanese Patent that is discussed in the background of the ’101 Patent and cited on the face of the ’101 Patent. EX1001, Cover; EX2001, ¶96. Nobuyoshi states that its problem to be solved is “[t]o provide a technology whereby a terminal can take a midway participation in the simultaneous playback processing among the other terminals while the other terminals share data and simultaneously reproduce the shared data.” EX2001, ¶96 (citing EX1014, Abstract). As the ’101 Patent itself explains, Nobuyoshi discloses “a system that allows a plurality of reception devices to synchronously reproduce content even if time to start reproduction of the content varies depending on the reception device. In this distribution system, while a first reception device is reproducing content, a second reception device estimates a time required to start reproduction of the content and determines reproduction start time based on the estimated time. Then, the second

reception device transmits the determined reproduction start time to the transmission device.” EX2001, ¶96 (citing EX1001, 1:33-41).

2. Nobuyoshi does not cure the deficiencies of Chou.

Nobuyoshi was considered at the time the ’101 Patent was prosecuted as evidenced by Nobuyoshi’s citation on the face of the patent. EX2001, ¶98. Nobuyoshi is relied on in combination with Chou as allegedly disclosing claims 5, 7, and 15. *Id.*; Pet., §IX.C. The Petition does not allege that Nobuyoshi remedies the deficiencies of Chou as they relate to Claim Element [1d] discussed above. EX2001, ¶98. Indeed, as evidenced by the Examiner’s consideration of Nobuyoshi during prosecution, it does not disclose, teach, or suggest the elements of Claim 1 (or the other independent claims). *Id.*

V. THE BOARD SHOULD EXERCISE ITS DISCRETION TO DENY INSTITUTION

Institution of an IPR is entirely discretionary—“the PTO is permitted, but never compelled, to institute.” *Harmonic Inc. v. Avid Tech., Inc.*, 815 F.3d 1356, 1367 (Fed. Cir. 2016). The combined discretionary considerations under Sections 314(a) and 325(b) strongly favor denying institution here.

A. Institution should be denied under 35 U.S.C. § 325(d)

In determining whether to institute an *inter partes* review, the Board may reject a petition because “the same or substantially the same” prior art or arguments previously were presented to the Board. 35 U.S.C. § 325(d); *see also* CTPG, 61.

The question of whether proffered art or arguments are “the same or substantially the same” as art or arguments previously presented to the Office is a highly factual inquiry, which may be resolved by reference to the factors set forth in *Becton*. See *Becton, Dickinson & Co. v. B. Braun Melsungen AG*, IPR2017-01586, Paper 8 (P.T.A.B. Dec. 15, 2017) (precedential as to §III.C.5, first paragraph). If a petition presents the same or substantially the same art or arguments that were previously considered by the Patent Office, the Board determines whether a Petitioner has shown that the examiner materially erred when evaluating that art or argument. See *Advanced Bionics, LLC v. MED-EL Elektromedizinische Geräte GmbH*, IPR2019-01469, Paper 6 at 10 (P.T.A.B. Feb. 13, 2020) (precedential). Here, Petitioner has failed to provide any analysis of § 325(d) whatsoever. Rather, Petitioner, in a conclusory fashion, briefly states that “[d]enial of institution under §325(d) would be inappropriate because this Petition relies on grounds and arguments not previously presented to the Office. The relied-upon art was not considered during prosecution.” Pet., 22. Not only is this factually incorrect, but also grounds for the Board to deny institution. Thus, the Board should deny institution under 35 U.S.C. § 325(d).

1. The same or substantially the same prior art or arguments were presented to the Patent Office

a. Chou (Ground 1)

For Ground 1, Petitioner relies on Chou to teach every element of claim 1. In the Notice of Allowance, the Examiner noted that “[t]he prior art of record fails to anticipate or render obvious the combined elements” [1b], [1d], and [1e]. EX1002, 13-14; Pet., 26-42. Although Petitioner argues that Chou discloses or renders obvious element [1d],⁸ examination of the actual disclosure of Chou reveals that its disclosure is substantially the same as Hejna, prior art of record. See EX1001, Cover. For example, as outlined below, the disclosure of Chou relied on by Petitioner were all present in Hejna. Pet., 35.

First, Petitioner indicates that “*Chou* discloses that ‘[i]n regard to the target arrival time for each frame, these are chosen [to] make the *amount of time* between the target time of the frame and its playback time *large enough*[.]’” Pet., 35 (citing EX1004, ¶0027) (emphasis added). Likewise, the Hejna specification discloses that “in accordance with the present invention, *more time is provided* for data to arrive

⁸ As indicated by the Petitioner, claim 27 is “substantially similar” to claim 1, and claim element [27d] claims a “distribution system, comprising 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 data stored in the storage device of the reception device[.]” Pet., 58-59; EX2011.

at [User System] before the data in Capture Buffer is exhausted.” EX2011, 4:60-63 (emphasis added).

Second, Petitioner maintains that *Chou* further discloses that “an upper bound on the *time of arrive* of bits into the client buffer, to a target level” is controlled. Pet., 35 (citing EX1004, ¶0019) (emphasis added). Similarly, the Hejna specification discloses that “embodiments of the present invention enable the broadcast server to send out a steady stream of information, and the recipients of the intermittently arriving data to adjust the playback rate of the data to accommodate the non-uniform arrival rates. In addition, in accordance with the present invention, each of the recipients can *accommodate the arrival rates independently*.” EX2011, 8:50-57 (emphasis added).

Third, Petitioner states 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.” Pet., 35 (emphasis added). The Hejna specification discloses that “[i]n accordance with the present invention, embodiment 4000 causes the client to be joined to a data stream whose re-broadcast start time *is closest* (temporally) to the arrival of the client’s request[,]” as well. EX2011, 14:3:7 (emphasis added).

Therefore, Chou's disclosure is substantially the same as and thus cumulative of Hejna, prior art of record, and therefore suffers from the same deficiencies. Accordingly, *Becton* factors (a), (b), and (d) support denial of Institution.

b. Chou in view Nobuyoshi

Petitioner incorrectly declares that the “[p]etition relies on grounds and arguments not previously presented to the Office.” Pet., 22. The Nobuyoshi reference was brought to the attention of the Examiner in the Background Art section of the application and in an Information Disclosure Statement, signed by the Examiner, submitted during the prosecution of the '101 Patent. EX1001, Cover. Consequently, the Examiner would have been fully aware of, and considered, the disclosure of Nobuyoshi during the prosecution of the '101 Patent. Petitioner's cited art, therefore, “adds no teaching that was not before the Examiner.” *Dr. Reddy's Labs. S.A., v. Indivior UK Ltd.*, IPR2019-00328, Paper 21 at 16 (P.T.A.B. June 3, 2019); *see also Stryker Corp. v. KFx Medical, LLC*, IPR2019-00817, Paper 10 at 23-25 (P.T.A.B. Sept. 16, 2019). As a result, the Board should exercise its discretion and deny institution.

2. Petitioner failed to establish the Office erred in a manner material to the patentability of the challenged claims

Petitioner merely asserts conclusively that the Examiner erred, without pointing out how the Examiner erred in evaluation of the asserted prior art. Pet., 16. Nor did Petitioner point to additional evidence or facts that warrant reconsideration

of the prior art or arguments. *Id.* Petitioner failed to meet its burden of showing the Office erred in a manner material to patentability.

The Board should not waste resources repeating what the Examiner has already done, forcing Patent Owner to again defend its claims over the same or substantially the same art that was fully vetted during prosecution, especially where Petitioner has chosen to completely disregard the *Becton* factors.

VI. CONCLUSION

For the reasons set forth herein, the Petition should be denied.

Date: December 6, 2023

Respectfully submitted,

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CERTIFICATE OF COMPLIANCE

Pursuant to 37 C.F.R. § 42.24(d), the undersigned certifies that the foregoing Patent Owner Preliminary Response, exclusive of the exempted portions as provided in 37 C.F.R. § 42.24(a), contains no more than 14,000 words and therefore complies with the type-volume limitations of 37 C.F.R. § 42.24(b).

Date: December 6, 2023

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CERTIFICATE OF SERVICE

Pursuant to 37 C.F.R. §§ 42.6(e) and 42.105(a), this is to certify that I caused to be served a true and correct copy of the foregoing “PATENT OWNER’S PRELIMINARY RESPONSE” and Exhibits 2001-2011 thereto via the PTAB’s E2E system and sent via email as detailed below.

Date of service: December 6, 2023

Documents served: PATENT OWNER’S PRELIMINARY RESPONSE

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