

UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE PATENT TRIAL AND APPEAL BOARD

AYLO FREESITES LTD,

Petitioner

v.

DISH TECHNOLOGIES L.L.C.,

Patent Owner

U.S. Patent 11,991,234

Issue Date: May 21, 2024

Title: APPARATUS, SYSTEM, AND METHOD FOR MULTI-BITRATE
CONTENT STREAMING

Inter Partes Review No. IPR2024-00940

**PETITIONER AYLO FREESITES LTD'S
NOTICE OF APPEAL**

Mail Stop PATENT BOARD
Patent Trial and Appeal Board
United States Patent and Trademark Office
PO Box 1450
Alexandria, Virginia 22313-1450
Submitted Electronically via PTAB P-TACTS

Pursuant to 28 U.S.C. § 1295(a)(4)(A), 35 U.S.C. §§ 141, 142, and 319, 5 U.S.C. §§ 701–706, the All Writs Act (28 U.S.C. § 1651), and 37 C.F.R. §§ 42.75(e)(3), 90.2, and 90.3, notice is hereby given that Petitioner Aylo Freesites Ltd (“Aylo”) appeals to the United States Court of Appeals for the Federal Circuit (“Federal Circuit”) from the Order of the Director of the USPTO entered on February 3, 2026 (Paper 75) vacating the Final Written Decision of the Patent Trial and Appeal Board (“Board”) entered on April 14, 2025 (Paper 73) and terminating the proceeding, and from all underlying orders, decisions, opinions, and rulings regarding U.S. Patent No. 11,991,234 (“the ’234 Patent”) in *Inter Partes* Review IPR2024-00940. A copy of the Director’s Order is attached as **Exhibit A**. A copy of the Final Written Decision is attached as **Exhibit B**.

In accordance with 37 C.F.R. § 90.2(a)(3)(ii), the expected issues on appeal include, but are not limited to:

1. the Director and the Board’s determination that the Petition failed to name all real parties in interest, and the Director’s failure to allow correction of the real parties in interest identified in Aylo’s Petition without loss of the original filing date, such that Aylo’s Petition became retroactively time-barred under 35 U.S.C. § 315(b);
2. by virtue of the Director vacating the Final Written Decision of the Board, the failure of the Director and the Board (of which the Director is a part) to

issue a Final Written Decision addressing the patentability of the challenged claims, as statutorily required under 35 U.S.C. § 318(a), after instituting an *inter partes* review and proceeding through a full trial;

3. the so-called “shenanigans” that occurred here, *Cuozzo Speed Techs. v. Com. for Intell. Prop.*, 579 U.S. 261, 275 (2016), and the Director’s arbitrary and capricious reasoning, where the Director vacated a Final Written Decision invalidating certain challenged claims and then terminated the *inter partes* review without a Final Written Decision, effectively determining the outcome of the proceeding without addressing the merits after a full trial was held, raising due process concerns;

4. the Director’s retroactive application or interpretation of rules, caselaw, and statutes in its decision to vacate a Final Written Decision and terminate the *inter partes* review after the parties litigated the entire case and the Board held a full trial and issued a Final Written Decision, raising due process concerns;

5. any finding, determination, judgment, or order supporting or relating to the Director’s order decided adversely to Aylo in *Inter Partes* Review IPR2024-00940.

This Notice of Appeal is timely filed. A copy of this Notice of Appeal is being concurrently filed with the Board. In addition, a copy of this Notice of Appeal, along

with the required docketing fees, are being filed with the Clerk's Office for the United States Court of Appeals for the Federal Circuit.

DATED: March 19, 2026

Respectfully submitted,

By: /Frank M. Gasparo/
Frank M. Gasparo (Reg. No. 44,700)
Attorney for Petitioner
VENABLE LLP
151 W. 42nd Street, 49th Floor
New York, NY 10036
T 212-370-6273
F 212-307-5598
fmgasparo@Venable.com

CERTIFICATE OF FILING

I certify that, in addition to being electronically filed with the Patent and Trial Board, the original version of the foregoing Aylo's Notice of Appeal was filed by email with the Director of the United States Patent and Trademark Office at efileSO@uspto.gov.

I certify that a true and correct copy of the foregoing Patent Owner's Notice of Appeal was filed electronically with the Clerk's Office of the United States Court of Appeals for the Federal Circuit on this 19th day of March, 2026.

CERTIFICATE OF SERVICE

I hereby certify that on March 19, 2026 I caused a true and correct copy of the foregoing Aylo's Notice of Appeal to be served via email to the counsel of record:

Lead Counsel: Eliot D. Williams (Reg. No. 50,822) BAKER BOTTS L.L.P. 700 K Street, N.W. Washington, D.C. 20001 T: 202.639.1334 F: 202.639.1167 eliot.williams@bakerbotts.com DishvMindGeek@BakerBotts.com	Backup Counsel: G. Hopkins Guy III (Reg. No. 35,866) BAKER BOTTS L.L.P. 1001 Page Mill Road, Bldg. 1, Suite 200 Palo Alto, California 94304-1007 T: 650.739.7500 F: 650.739.7610 hop.guy@bakerbotts.com DishvMindGeek@BakerBotts.com Ali Dhanani (Reg. No. 66,233) BAKER BOTTS L.L.P. 910 Louisiana St. Houston, TX 77002 T: 713.229.1108 F: 713.229.2808 ali.dhanani@bakerbotts.com
--	--

	DishvMindGeek@BakerBotts.com Thomas B. Carter Jr. (Reg. No. 76,040) BAKER BOTTS L.L.P. 910 Louisiana St. Houston, TX 77002 T: 713.229.1505 F: 713.229.7805 thomas.carter@bakerbotts.com DishvMindGeek@BakerBotts.com Andrew Wilson (Reg. No. 74,093) BAKER BOTTS L.L.P. 700 K Street, N.W. Washington, D.C. 20001 T: 202.639.1312 F: 202.508-9336 andrew.wilson@bakerbotts.com DishvMindGeek@BakerBotts.com Jamie R. Lynn (Reg. No. 63,666) BAKER BOTTS L.L.P. 700 K Street, N.W. Washington, D.C. 20001 T: 202.639.7786 F: 202.585.1026 jamie.lynn@bakerbotts.com DishvMindGeek@BakerBotts.com Zacharias E. Shepard (Reg. No. 83,358) BAKER BOTTS L.L.P. 910 Louisiana Street Houston, TX 77002 T: 713.229.6234 F: 713.220.6134 zach.shepard@bakerbotts.com DishvMindGeek@BakerBotts.com
--	--

DATED: March 19, 2026

Respectfully submitted,

By: /Frank M. Gasparo/
Frank M. Gasparo (Reg. No. 44,700)
Attorney for Petitioner
VENABLE LLP
151 W. 42nd Street, 49th Floor
New York, NY 10036
T 212-370-6273
F 212-307-5598
fmgasparo@Venable.com

Exhibit A

UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE OFFICE OF THE UNDER SECRETARY OF COMMERCE
FOR INTELLECTUAL PROPERTY AND DIRECTOR OF THE
UNITED STATES PATENT AND TRADEMARK OFFICE

AYLO FREESITES LTD,
Petitioner,

v.

DISH TECHNOLOGIES L.L.C.,
Patent Owner.

IPR2024-00940
Patent 11,991,234 B2

Before JOHN A. SQUIRES, *Under Secretary of Commerce for Intellectual
Property and Director of the United States Patent and Trademark Office.*

ORDER

Initiating *Sua Sponte* Director Review, Vacating the Final Written Decision,
and Dismissing the Petition

On January 9, 2026, the Board issued an Order (Paper 71) denying Patent Owner’s Motion to Dismiss the Petition for failure to name all real parties in interest (“RPI”). In denying the motion, the Board determined that Petitioner should have identified 9219-1468 Quebec Inc. (“9219”)—a services affiliate of Petitioner and co-defendant in parallel district court litigation involving the challenged patent—as an RPI in the proceeding. *Id.* at 7. Nevertheless, the Board determined that, because the proceeding already had been instituted, *Proppant Express Investments, LLC v. Oren Technologies, LLC*, IPR2017-01917, Paper 86 (PTAB Feb. 13, 2019) (precedential) (“*Proppant*”) governs. *Id.* at 8.

Under *Proppant*, the Board may “accept updated mandatory notices as long as the petition would not have been time-barred under 35 U.S.C. § 315(b) if it had included the [RPI].” *Proppant*, Paper 86 at 7. *Proppant* also explains that in determining whether to accept mandatory notices while maintaining a petition’s original filing date, the Board considers: (1) whether the petitioner has attempted to circumvent the time bar or estoppel rules, (2) petitioner bad faith, (3) prejudice to the patent owner from the delay, and (4) petitioner gamesmanship. *Id.* at 6–7.

The Board subsequently applied *Proppant* and found that there was no evidence that Petitioner attempted to circumvent the time bar or engaged in bad faith or gamesmanship, that there was no prejudice to Patent Owner, and that the appropriate remedy under *Proppant* was to allow Petitioner to update its identification of RPIs while preserving the Petition’s filing date. Paper 71, 7–8. The Board considered Patent Owner’s argument that, under *Corning Optical Communications RF, LLC v. PPC Broadband Inc.*, IPR2014-00440, Paper 68 (PTAB Aug. 18, 2015) (precedential), the Petition

should not retain its filing date and, thus, the Board was required to dismiss the Petition. *Id.* However, the Board determined that, “to the extent there is a perceived conflict with *Corning Optical*, *Proppant* governs this post-institution phase.” *Id.* at 8. Petitioner updated its mandatory notices on January 9, 2026, to identify 9219. Paper 72.

Corning Optical explains that, “[u]nder 35 U.S.C. § 312(a)(2), we may consider a petition for *inter partes* review ‘only if . . . the petition identifies all real parties in interest.’” IPR2014-00440, Paper 68 at 23; *see also* 37 C.F.R. § 42.8 (requiring petitioners and patent owners to “[i]dentify each real party-in-interest for the party”). Thus, under *Corning Optical*, “any Petition corrected to disclose additional RPIs must be given a new filing date.” IPR2014-00440, Paper 68 at 23. The Board did not err in relying on *Proppant*. However, in view of my designation of *Corning Optical* as precedential and the requirement of § 312(a)(2) to identify all RPIs, *Proppant* is de-designated as precedential.¹ Thus, Petitioner’s correction to disclose additional RPIs requires according the Petition a new filing date of January 9, 2026. *Id.*

Petitioner admits that 9219 was time-barred under § 315(b) before Patent Owner filed its Motion to Dismiss. Paper 69, 1. The new filing date accorded to the Petition, which is after the filing date of the Motion to Dismiss, results in the Petition being time-barred under § 315(b). As a

¹ For the same reasons, *Adello Biologics, LLC v. Amgen Inc.*, PGR2019-00001, Paper 11 (PTAB Feb. 14, 2019), which grants a petitioner’s motion to amend its mandatory notices while keeping the petition’s filing date, is also de-designated as precedential.

result, the Board's Final Written Decision (Paper 73) is vacated and the Petition is dismissed.

Accordingly, based on the foregoing, it is:

ORDERED that a *sua sponte* Director Review is initiated;

FURTHER ORDERED that the Board's Final Written Decision (Paper 73) is vacated; and

FURTHER ORDERED that the Petition is dismissed and the proceeding is terminated.

IPR2024-00940
Patent 11,991,234 B2

FOR PETITIONER:

Frank M. Gasparo
Ian G. Paquette
Philip T. Sheng
VENABLE LLP
fmgasparo@venable.com
igpaquette@venable.com
ptsheng@venable.com

FOR PATENT OWNER:

Eliot D. Williams
Ali Dhanani
G. Hopkins Guy III
Thomas B. Carter Jr.
Andrew Wilson
Jamie R. Lynn
Zacharias E. Shepard
BAKER BOTTS L.L.P.
eliot.williams@bakerbotts.com
ali.dhanani@bakerbotts.com
hop.guy@bakerbotts.com
thomas.carter@bakerbotts.com
andrew.wilson@bakerbotts.com
jamie.lynn@bakerbotts.com
zach.shepard@bakerbotts.com

Exhibit B

UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE PATENT TRIAL AND APPEAL BOARD

AYLO FREESITES LTD,
Petitioner,

v.

DISH TECHNOLOGIES L.L.C.,
Patent Owner.

IPR2024-00940
Patent 11,991,234 B2

Before THU A. DANG, MICHELLE N. WORMMEESTER, and
JOHN A. HUDALLA, *Administrative Patent Judges*.

HUDALLA, *Administrative Patent Judge*.

JUDGMENT
Final Written Decision
Determining Some Challenged Claims Unpatentable
Dismissing Patent Owner's Motion to Strike
Dismissing Petitioner's Motion to Exclude
35 U.S.C. § 318(a); 37 C.F.R. §§ 42.23(b), 42.64(c)

Aylo Freesites Ltd (“Petitioner”) filed a Petition (Paper 1, “Pet.”) requesting an *inter partes* review of claims 1–20 (“the challenged claims”) of U.S. Patent No. 11,991,234 B2 (Ex. 1001, “the ’234 patent”). DISH Technologies L.L.C. (“Patent Owner”) filed a Preliminary Response (Paper 9). With our authorization, Petitioner filed a Preliminary Reply (Paper 10) and Patent Owner filed a Preliminary Sur-reply (Paper 11). Taking into account the arguments presented by Patent Owner in the preliminary record, we determined that the information presented in the Petition established that there was a reasonable likelihood that Petitioner would prevail with respect to at least one of the challenged claims. Pursuant to 35 U.S.C. § 314, we instituted this proceeding on November 24, 2024, as to all challenged claims and all grounds of unpatentability presented in the Petition. Paper 12 (“Dec. on Inst.”).

During the course of trial, Patent Owner filed a Patent Owner Response (Paper 20, “PO Resp.”), and Petitioner filed a Reply to the Patent Owner Response (Paper 45, “Pet. Reply”). Patent Owner also filed a Sur-reply (Paper 55, “PO Sur-reply”). An oral hearing was held on August 22, 2025, and a transcript of the hearing is included in the record. Paper 64 (“Tr.”).

Petitioner filed declarations of Henry Houh, Ph.D., with its Petition (Ex. 1003) and Reply (Ex. 1022). Patent Owner filed a declaration of Dr. Kevin Jeffay with its Response. Ex. 2141. Patent Owner also filed declarations of Robert Drew Major (Ex. 2020), Gregory Smith (Ex. 2099), David R. Ericson (Ex. 2100), John Edwards (Ex. 2123), Peter Ratcliffe, Esq. (Ex. 2126), and Mark Mitchell (Ex. 2127). The parties additionally filed transcripts of the depositions of Dr. Houh (Ex. 2150), Dr. Jeffay (Ex. 1023),

Mr. Major (Ex. 1025), Mr. Mitchell (Ex. 1026), Mr. Ericson (Ex. 1027), and Mr. Ratcliffe (Ex. 1037).

With our authorization, Patent Owner filed a motion to strike portions of Petitioner's Reply and Dr. Houh's Reply Declaration related to the "arranging" limitation in claim 1 and the "continuous presentation" limitation in claim 12. Paper 50 ("Strike Mot."). Petitioner filed an opposition (Paper 54, "Strike Opp.") and Patent Owner filed a reply (Paper 56, "Strike Reply").

Petitioner filed a motion to exclude (1) Exhibits 2041–2043, 2059, 2067, 2081, 2088, 2089, and 2091; (2) a citation in Patent Owner's Sur-reply to a declaration by Dr. Houh from another proceeding that is not part of the instant record; and (3) the portions of Patent Owner's papers that refer to these things. Paper 57 ("Exclude Mot."). Patent Owner filed an opposition (Paper 58, "Exclude Opp.") and Petitioner filed a reply (Paper 59, "Exclude Reply").

We have jurisdiction under 35 U.S.C. § 6. This decision is a Final Written Decision under 35 U.S.C. § 318(a) as to the patentability of claims 1–20 of the '234 patent. For the reasons discussed below, Petitioner has demonstrated by a preponderance of the evidence that claims 1–11 of the '234 patent are unpatentable. Petitioner has not demonstrated by a preponderance of the evidence that claims 12–20 of the '234 patent are unpatentable.

I. BACKGROUND

A. *Real Parties-in-Interest*

Petitioner identifies Aylo Freesites Ltd (f/k/a MG Freesites Ltd), Aylo Premium Ltd (f/k/a MG Premium Ltd), Aylo Billing Limited (f/k/a MG Billing Limited), and 9219-1568 Québec Inc. as the real parties-in-interest. Pet. 1; Paper 72, 1. Patent Owner identifies DISH Technologies L.L.C. and Sling TV L.L.C., as well as EchoStar Corporation, as the real parties-in-interest. Paper 4, 2.

B. *Related Matters*

As required by 37 C.F.R. § 42.8(b)(2), the parties identify various related matters. Pet. 1–3; Paper 4, 2–6; Paper 14, 1; Paper 17, 1; Paper 44, 2–7; Paper 46, 1.

Furthermore, both parties reference an investigation of the International Trade Commission (ITC) under 19 U.S.C. § 1337 styled *In the Matter of Certain Fitness Devices, Streaming Components Thereof, and Systems Containing Same*, Inv. No. 337-TA-1265 (ITC instituted May 13, 2021) (“the ITC Investigation”). See Pet. 12–14, 58–59; Paper 4, 3. Petitioner states that iFIT, Inc. and Patent Owner were involved in the ITC Investigation. Pet. 12.

C. *The '234 Patent*

The '234 patent is directed to “adaptive-rate shifting of streaming content” over packet-switched networks such as the Internet. Ex. 1001, 1:35–38. The '234 patent addresses a purported need to “utilize multiple connections between a source and destination, requesting varying bitrate streams depending upon network conditions.” *Id.* at 2:67–3:3.

Figure 1 of the '234 patent is reproduced below.

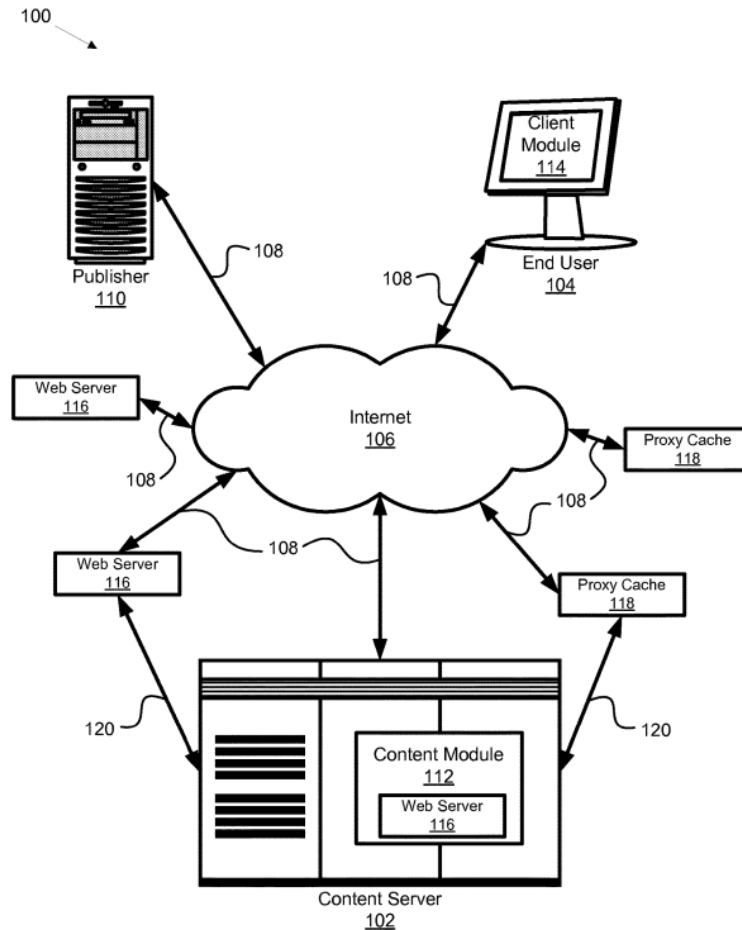


FIG. 1

Figure 1 depicts “system 100 for dynamic rate shifting of streaming content.” Ex. 1001, 6:36–38. System 100 includes content server 102, end user station 104, publisher 110, and web server 116. *Id.* at 6:39–55. Content may be transferred over Internet 106 to content server 102, and content from content server 102 may be replicated to other web servers 116. *Id.* at 6:59–61, 7:4–5.

Figure 2b of the '234 patent is reproduced below.

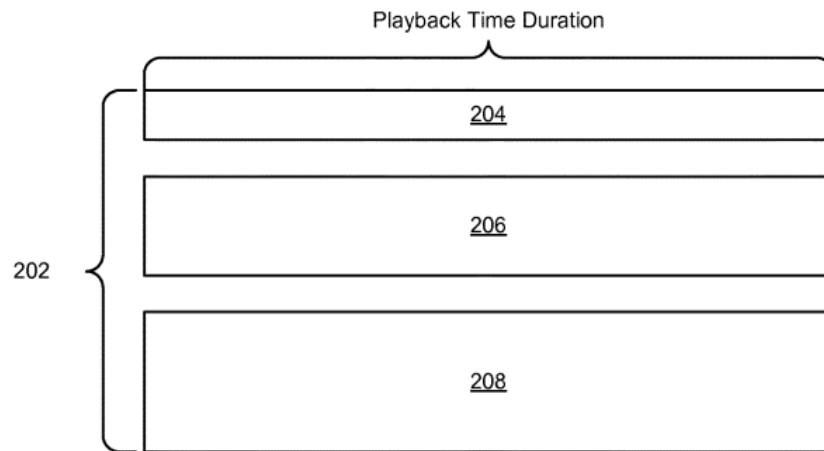


FIG. 2b

Figure 2b depicts “a plurality of streams 202 having varying degrees of quality and bandwidth.” Ex. 1001, 7:28–30. Streams 202 comprise low quality stream 204, medium quality stream 206, and high quality stream 208, and each of streams 204, 206, 208 is a copy of content file 200 encoded and compressed to varying bit rates. *Id.* at 7:30–34.

Figure 3a of the '234 patent is reproduced below.

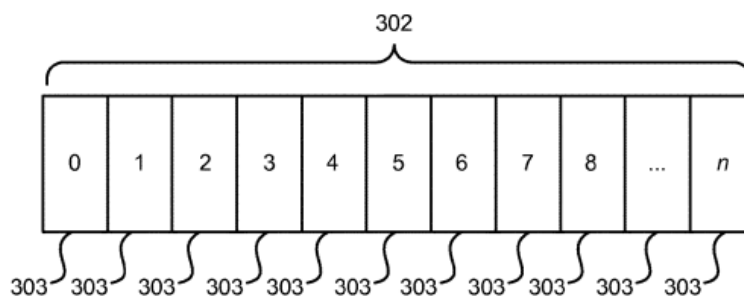


FIG. 3a

Figure 3a depicts “stream 302 divided into a plurality of source streamlets 303,” which are “any sized portion[s] of the content file 200.” Ex. 1001, 7:40–43.

Figure 3b of the '234 patent is reproduced below.

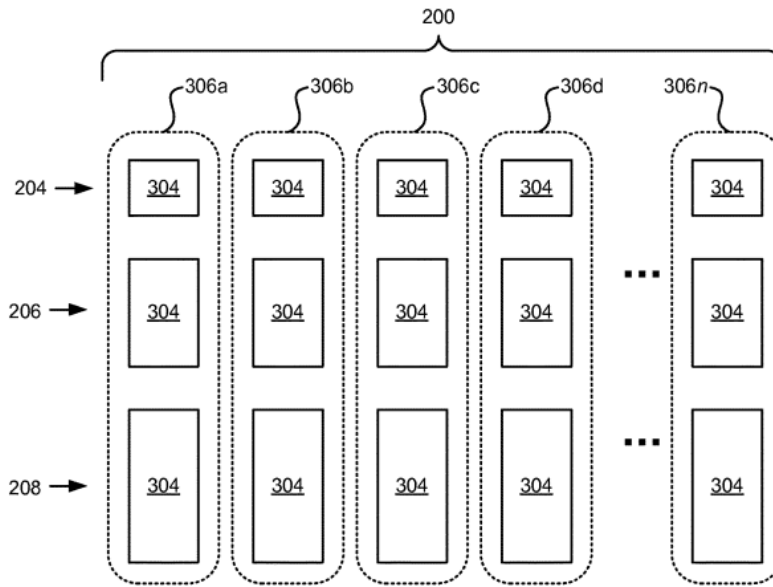


FIG. 3b

Figure 3b depicts “sets 306 of streamlets.” Ex. 1001, 7:58–59. A “set” is a “group of streamlets having identical time indices and durations but varying bitrates.” *Id.* at 7:60–62. For example, “set 306a includes encoded streamlets 304 having low, medium, and high 204, 206, 208 bitrates.” *Id.* at 7:64–65.

The application that led to the '234 patent was filed on December 21, 2022, and claims priority to, *inter alia*, a provisional application that was filed on April 30, 2004. Ex. 1001, codes (22), (60); *see also* Pet. 8, 11 (noting same). Petitioner assumes a priority date of April 30, 2004, for purposes of this proceeding (Pet. 11), so we apply that date for determining whether the asserted references qualify as prior art.

D. Illustrative Claim

Of the challenged claims, claims 1 and 12 are independent. Claims 2–11 depend directly or indirectly from claim 1, and claims 13–20 depend from claim 12. Claim 1 is illustrative of the challenged claims and recites:

1. An end user station for adaptive-rate content streaming of digital content comprising:

a client module configured to be connected to a network having at least one server and further configured to request digital content over the network via at least one transmission control protocol (TCP) connection, wherein at least two different copies of the digital content are each encoded at different bit rates and stored on the at least one server, wherein each copy of the digital content is divided into a plurality of streamlets, each of the plurality of streamlets of a corresponding copy comprising a different portion of the digital content during presentation, wherein corresponding streamlets across the at least two different copies comprise the same corresponding portions of the digital content during presentation, and wherein the client module streams the digital content by:

requesting a first streamlet from the at least one server;

automatically requesting from the at least one server subsequent portions of the digital content by requesting for each subsequent portion one of the streamlets from the different copies of the digital content dependent upon successive determinations by the client module to change a currently requested bit rate to a higher or lower bit rate, the automatically requesting including repeatedly generating a factor indicative of a current ability to receive digital content at a rate sufficient for presenting the digital content as the digital content is received;

making the successive determinations to change the digital content bit rate based on the factor using the streamlets of one of the different copies of the digital content having the highest bit rate determined receivable for presentation so that the client module selects a higher bit rate one of the different copies when the factor is greater than a first threshold and

selects a lower bit rate one of the different copies when the factor is less than a second threshold; and

arranging the streamlets requested from the at least one server in order of ascending presentation time for output to a presentation device.

Ex. 1001, 18:30–19:3.

E. Prior Art

Petitioner relies on the following prior art:

International Patent Publication No. WO 02/49343 A1, filed Dec. 14, 2001, published June 20, 2002 (Ex. 1004, “Leaning”);

U.S. Patent Application Publication No. 2003/0236906 A1, filed June 24, 2002, published Dec. 25, 2003 (Ex. 1006, “Klemets”);¹ and

U.S. Patent Application Publication No. 2004/0093420 A1, filed Nov. 13, 2002, published May 13, 2004 (Ex. 1020, “Gamble”).

F. The Instituted Grounds

We instituted *inter partes* review of claims 1–20 of the ’234 patent on the following grounds (Dec. on Inst. 36), which are all the grounds presented in the Petition (Pet. 4):

Claims Challenged	35 U.S.C. §	References
1–15, 17–20	103(a) ²	Leaning

¹ Petitioner mistakenly identifies this reference as “Klements” throughout the Petition.

² The Leahy-Smith America Invents Act (“AIA”), Pub. L. No. 112-29, 125 Stat. 284, 287–88 (2011), amended 35 U.S.C. §§ 102 and 103. Because the ’234 patent claims priority to an application filed before March 16, 2013 (the effective date of the relevant amendments), we assume that the pre-AIA

Claims Challenged	35 U.S.C. §	References
1–15, 17–20	103(a)	Leaning, Klemets
16	103(a)	Leaning, Gamble
16	103(a)	Leaning, Klemets, Gamble

II. ANALYSIS

A. *Legal Standards*

A claim is unpatentable under 35 U.S.C. § 103(a) 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. *See KSR Int’l Co. v. Teleflex Inc.*, 550 U.S. 398, 406 (2007).

The question of obviousness is resolved on the basis of underlying factual determinations, including (1) the scope and content of the prior art; (2) any differences between the claimed subject matter and the prior art; (3) the level of skill in the art; and (4) where in evidence, so-called secondary considerations. *See Graham v. John Deere Co.*, 383 U.S. 1, 17–18 (1966). We also recognize that prior art references must be “considered together with the knowledge of one of ordinary skill in the pertinent art.” *In re Paulsen*, 30 F.3d 1475, 1480 (Fed. Cir. 1994) (citing *In re Samour*, 571 F.2d 559, 562 (CCPA 1978)).

versions of §§ 102 and 103 apply. However, the outcome of our decision would be the same under the current version of the statutes.

B. Level of Ordinary Skill in the Art

Citing testimony from Dr. Houh, Petitioner contends a person of ordinary skill in the art “would have had at least a B.S. degree in computer science or electrical engineering (or comparable degree) and two years of experience in networking or streaming media, or a M.S. in computer science or electrical engineering (or comparable degree).” Pet. 12 (citing Ex. 1003 ¶ 45). Patent Owner does not address the level of ordinary skill in the art in its post-institution papers.

We adopt Petitioner’s definition of the level of ordinary skill in the art. On the present record, we are satisfied that this definition of the level of skill is consistent with the teachings of the ’234 patent and the asserted prior art.

C. Claim Interpretation

In an *inter partes* review, we construe each claim 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). Accordingly, our claim construction standard is the same as that of a district court. *See id.* Under the standard applied by district courts, claim terms are generally given their plain and ordinary meaning, as would have been understood by a person of ordinary skill in the art at the time of the invention and in the context of the entire patent disclosure. *Phillips v. AWH Corp.*, 415 F.3d 1303, 1313 (Fed. Cir. 2005) (en banc). “There are only two exceptions to this general rule: 1) when a

patentee sets out a definition and acts as his own lexicographer, or 2) when the patentee disavows the full scope of a claim term either in the specification or during prosecution.” *Thorner v. Sony Comput. Entm’t Am. LLC*, 669 F.3d 1362, 1365 (Fed. Cir. 2012).

In the Petition, Petitioner references certain of Patent Owner’s claim construction positions from the ITC Investigation and various constructions made by the Administrative Law Judge (ALJ) in the ITC Investigation, including those related to the term “virtual timeline.” *Id.* at 12–14. In its Reply, Petitioner argues that the phrase “to achieve continuous presentation” in claim 12 is “merely aspirational” such that “[a]ctually achieving uninterrupted, continuous playback is not required.” Pet. Reply 2 (citing Ex. 1022 ¶ 12; Ex. 2141 ¶ 46; *Bristol-Myers Squibb v. Ben Venue Lab’ys*, 246 F.3d 1368, 1376 (Fed. Cir. 2001)).

Patent Owner states that “[n]o construction of any claim term is required because the Petitioner fails to meet its burden of showing that each and every limitation of the Challenged Claims is disclosed in the prior art under any construction, including their own.” PO Resp. 17. In addition, Patent Owner argues that Petitioner failed to address the “continuous presentation” limitation in its Petition, which renders improper Petitioner’s arguments about the same in the Reply. PO Resp. 18; PO Sur-reply 1–5; *see also* Paper 50 (moving to strike Petitioner’s reply arguments as improper). Notwithstanding, Patent Owner argues that we should apply the plain meaning of “continuous presentation” (i.e., excluding interruptions) and not discount it as merely aspirational. PO Sur-reply 6–8. Patent Owner also addresses the construction of “virtual timeline” as part of its arguments against Petitioner’s unpatentability contentions. *See* PO Resp. 32–33.

1. “virtual timeline” (claim 9)

Petitioner proposes that the term “‘virtual timeline’ should be construed as ‘a playlist of entire content files.’” Pet. 12–13 (citing Ex. 1003 ¶¶ 43–46). In support of this construction, Petitioner cites the ’234 patent’s description of a virtual timeline being “‘a file that is configured to define a playlist for a user to view’ which ‘may indicate that the publisher desires a user to watch a first show QMX 602a followed by QMX 602b and QMX 602c’ such that ‘the publisher may define a broadcast schedule in a manner similar to a television station.’” *Id.* at 12 (quoting Ex. 1001, 12:33–45) (citing *id.* at Figs. 6a–6c). Petitioner notes that Quantum Media Extension (QMX) files each “describe an entire content file” in the context of the ’234 patent. *Id.* at 12–13 (quoting Ex. 1001, 12:37–38).

Patent Owner argues that a virtual timeline is “configured to define a playlist” that “indicates the order in which the content within a content file is viewed, including that ‘the same content be looped over and over again.’” PO Resp. 32 (quoting Ex. 1001, 12:35–43, 12:48–51). Patent Owner also notes the ’234 patent’s disclosure that a virtual timeline can be used to “‘selectively edit content,’ such as filtering out—e.g., muting or skipping—portions of a content file that include ‘offensive content.’” *Id.* at 33 (quoting Ex. 1001, 12:64–13:4).

We determine that no construction of “virtual timeline” is necessary. *See, e.g., Realtime Data, LLC v. Iancu*, 912 F.3d 1368, 1375 (Fed. Cir. 2019) (“The Board is required to construe ‘only those 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))). Rather, as discussed below, the parties’ dispute appears

to be about whether the “virtual timeline” identified by Petitioner is used to arrange the requested streamlets, as is also recited in claim 9. We address that argument below. *See infra* § II.D.10.

2. “to achieve continuous presentation” (claims 12–20)

In its Reply, Petitioner argues that the phrase “to achieve continuous presentation” in claim 12 is “merely aspirational” such that “[a]ctually achieving uninterrupted, continuous playback is not required.” Pet. Reply 2 (citing Ex. 1022 ¶ 12; Ex. 2141 ¶ 46; *Bristol-Myers Squibb v. Ben Venue Labs*, 246 F.3d 1368, 1376 (Fed. Cir. 2001)). Petitioner argues that the rate changes in the ’234 patent are “made to ‘achieve’ continuous presentation,” which “indicates that there was no continuous presentation prior to the rate change.” *Id.* As such, Petitioner disputes that this recitation requires avoiding disruption during playback. *See id.*

Patent Owner argues that “[t]he Challenged Patent discloses avoiding disruptions and achieving continuous playback by buffering any received, but not yet played, streamlets in its ‘staging module’ . . . and arranging them in the correct order for playback, even if a decision to shift to a different bitrate is made.” PO Resp. 10. Patent Owner argues that we should apply the plain meaning of this phrase (i.e., excluding interruptions) and not discount it as merely aspirational. PO Sur-reply 6–8.

On this record, we determine that the recitation “to achieve continuous presentation” is limiting and requires an amount of continuous (uninterrupted) playback/presentation after an upshift or downshift. The specification describes agent controller 702 determining whether to upshift based on a trigger threshold Θ_{up} , which itself is based on various factors

including a current read ahead margin and a minimum safety margin. *See* Ex. 1001, 17:44–58. If agent controller 702 can sustain upshift quality, then it will upshift and request higher quality streams. *See id.* at 17:58–61. Conversely, when an upshift is not possible, agent controller 702 determines whether to downshift based a different threshold Θ_{down} , which itself is based on the same sort of factors. *See id.* at 18:4–7. When the stream quality is not adequate, it downshifts. *See id.* at 18:7–14. These disclosures are similar to the language of claim 12, which recites “repeatedly generating a factor indicative of a current ability to receive the digital content at a rate *sufficient for presenting the digital content as the digital content is received*, . . . wherein the factor relates to a performance of the network” and “making the successive determinations whether to change the requested bit rate based on the factor *to achieve continuous presentation* of the digital content using the individually-requestable portions of the highest bit rate one of the copies determined receivable at that time.” Ex. 1001, 20:5–16 (emphasis added). That is, claim 12 refers to “achiev[ing] continuous presentation” based on what is “sufficient for presenting the digital content,” trading quality to ensure continuous playback.

Requiring some uninterrupted playback also is consistent with the prosecution history of a related patent to which the '234 patent claims priority. The applicants in that case distinguished their invention over the prior art on the basis that “shifts happen on portion boundaries and the portion boundaries of the copies at the same time index in the video – meaning playback is continuous.” Ex. 1018, 486. That means that matching “the same time index in the video” across different quality copies of the video so the boundary at the end of a streamlet is aligned with the boundary

at the start of the next streamlet of a different quality, thus providing continuous presentation at the boundaries. This understanding also tracks the ITC Investigation. Specifically, the ALJ in the ITC Investigation determined that “the phrase ‘continuous playback of the video’ is the goal sought through the ‘determinations to shift’ playback quality.” Ex. 1009, 58–59.

Patent Owner generally agrees that “to achieve continuous presentation” requires some uninterrupted playback. Indeed, Patent Owner asserts “[t]he plain and ordinary meaning of ‘continuous presentation’ requires uninterrupted presentation across quality shifts.” PO Sur-reply 4 (capitalization and emphasis omitted). Patent Owner’s counsel clarified this understanding during the consolidated oral hearing for related cases IPR2024-00917, IPR2024-00918, and IPR2024-00919:

JUDGE HUDALLA: How continuous does continuous have to be? I mean, we put two sub-files together and they play uninterrupted, is that continuous?

MR. WILLIAMS: I would say that definitely would qualify. Yeah.

IPR2024-00917, Paper 71, 75; *accord id.* at 76 (“But I would say at the very least, you would need two during a rate switch. So switching from one to the other, that played back continuously. So at the very least, you would need that.”). According to Patent Owner, “[t]he claims do not require eliminating *all* interruptions under *every* conceivable scenario.” PO Sur-reply 7. They just require uninterrupted playback of at least two subfiles across a quality shift (i.e., rate shift).

In view of the foregoing, we determine that “to achieve continuous presentation” is limiting and at least encompasses the presentation of a

streamlet and a subsequent streamlet of a different quality without interruption after a rate shift. For example, there is no interruption when the subsequent streamlet is a higher quality streamlet. As another example, there is no interruption when the subsequent streamlet is a lower quality streamlet. As noted above, our determination is consistent with the claim language, the specification, the prosecution history, and the ITC's analysis.

3. *Other Terms*

We determine that no other aspects of the challenged claims require explicit construction. *See, e.g., Realtime Data, LLC v. Iancu*, 912 F.3d 1368, 1375 (Fed. Cir. 2019) (“The Board is required to construe ‘only those 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))).

D. *Obviousness Ground Based on Leaning*

Petitioner contends the subject matter of claims 1–15 and 17–20 would have been obvious over Leaning. Pet. 19–52; Pet. Reply 3–19. Patent Owner disputes Petitioner's contentions. PO Resp. 18–61; PO Sur-reply 4–26.

1. *Leaning*

Leaning is an international patent application publication directed to “the delivery, over a telecommunications link, of digitally coded material for presentation to a user.” Ex. 1004, 1:3–4. Figures 1 of Leaning is reproduced below.

Fig.1.

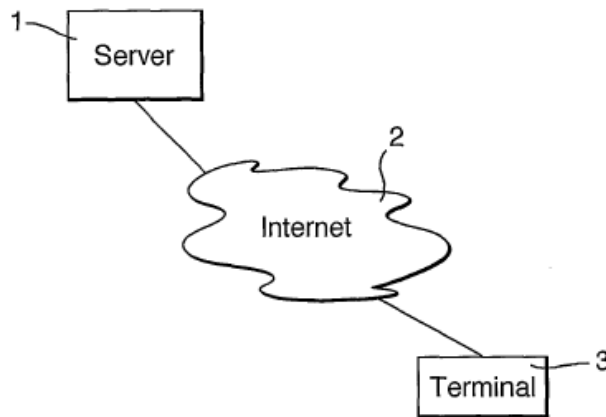


Figure 1 depicts a system where server 1 is connected via internet 2 to terminal 3. *Id.* at 2:15–16. Server 1 stores data files, and in response to a request for delivery of a data file from user terminal 3, server 1 transmits the file to terminal 3 via internet 2. *Id.* at 2:16–18. Although the system shown in Figure 1 delivers audio signals (for example, recorded music or speech), Leaning states that its system may also be used to deliver video signals. *Id.* at 2:5–9; *see also, e.g., id.* at code (57), 16:6–10.

Figure 2 of Leaning is reproduced below.

Fig.2.

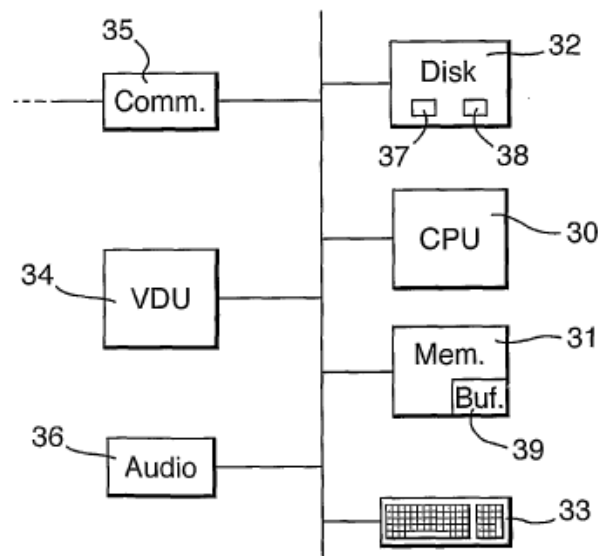


Figure 2 depicts terminal 3, which can take the form of a desktop computer, handheld computer, or mobile telephone. Ex. 1004, 4:4–7. Terminal 3 includes central processor 30, memory 31, disk store 32, keyboard 33, video display 34, communications interface 35, and interface 36. *Id.* at 4:7–9. Interface 36 can take the form of a sound card and/or a video card. *Id.* at 4:7–10. Memory 31 may include buffer 39. *Id.* at 4:15–16. Disk store 32 includes programs that may be retrieved into memory 31 for execution by processor 30. *Id.* at 4:10–11. For example, such programs may include communications program 37 for call-up and display of hypertext markup language (HTML) pages and player program 38 for playing audio and/or video files. *Id.* at 4:11–15, 16:6–10.

Leaning contemplates that server 1 may store two or more versions of a recording at different compression rates (e.g., recordings at compressions corresponding to continuous data rates of 8, 16, 24, and 32 kbit/s) such that player program 38 may switch automatically among them. Ex. 1004, 6:13–15. In this scenario, the recording is encoded several times at different rates and partitioned into sub-files. *Id.* at 6:21–23. The sub-files can be loaded onto server 1 in separate directories corresponding to each different rate, e.g., with “008k” and “024k” in the directory name indicating a rate of 8 kbit/s or 24 kbit/s, respectively. *Id.* at 6:23–26. An index file can be used to list the data rates that are available. *Id.* at 6:27–28. Player program 38 can trigger rate changes based on buffer status, the measured data rate, and the current (selected) data rate, for example. *Id.* at 8:6–26.

Petitioner notes that Leaning was published on June 20, 2002, and contends that Leaning qualifies as prior art under 35 U.S.C. § 102(b). Pet. 15. Patent Owner does not dispute the prior art status of Leaning. We

determine that Leaning qualifies as prior art under 35 U.S.C. § 102(b) because Leaning’s publication date of June 20, 2002, is more than one year before the earliest effective filing date of the challenged claims, which is April 30, 2004. Ex. 1001, code (60); Ex. 1004, code (43).

2. *Claim 1*

a. Preamble (1[Pre])

The preamble of claim 1 recites “[a]n end user station for adaptive-rate content streaming of digital content.” Ex. 1001, 18:30–31. Petitioner cites Leaning’s teaching of delivering digitally coded audio or video material over a telecommunications link from a sever to a terminal. Pet. 19–20 (citing Ex. 1004, code (57), 1:3–29). For “adaptive-rate content,” Petitioner cites Leaning’s teachings of the server storing recordings at different compression rates such that the user terminal’s “player program” is able to switch automatically between them. *Id.* at 20 (citing Ex. 1004, 6:13–15, 16:6–10, claim 1, Fig. 1).

Patent Owner does not dispute Petitioner’s analysis of the preamble. We find that Leaning teaches the preamble.³ *See, e.g.*, Ex. 1004, code (57), 1:3–29, 6:13–15, 16:6–10, claim 1, Fig. 1.

b. Limitation 1[A][1]

Claim 1 further recites “a client module configured to be connected to a network having at least one server and further configured to request digital

³ Because Petitioner shows persuasively that Leaning teaches the subject matter of the preamble, we need not determine whether the preamble is limiting. *See Realtime Data*, 912 F.3d at 1375.

content over the network via at least one transmission control protocol (TCP) connection.” Ex. 1001, 18:32–35. Petitioner maps the recited “client module” to Leaning’s “player program” on user terminal 3, which “provides the functionality necessary for the playing of audio files.” Pet. 20 (citing Ex. 1004, 4:4–15, 5:1–14). Petitioner notes that the player program is connected to internet 2 (i.e., a “network”) and can request media files by constructing a request message for transmission to server 1 (i.e., “at least one server”) via internet 2. *Id.* at 20–21 (citing, *inter alia*, Ex. 1004, 2:15–16, 2:18–22, 2:31–32, 5:8–14, Fig. 1).⁴ Petitioner contends that the requests are sent via a TCP connection based on Leaning’s disclosure that the player program makes requests using HTTP messages. *Id.* (citing Ex. 1004, 2:9–10, 2:15–16, 2:31–32); *see also id.* at 21–23 (citing, *inter alia*, Ex. 1003 ¶¶ 60–63) (discussing the background knowledge that an ordinarily skilled artisan would have possessed regarding HTTP and TCP). Petitioner further contends that,

to the extent Leaning does not explicitly disclose at least one TCP connection, a[n ordinarily skilled artisan] would have been motivated to modify Leaning such that Leaning’s HTTP requests to an ordinary webserver were made via at least one transmission control protocol (TCP) connection because essentially all such HTTP requests were made via at least one TCP connection at the time and such a modification would have yielded the predictable result of requesting and receiving desired files with the benefit of TCP’s built-in error checking capabilities to ensure every necessary file is received and put in order.

Id. at 22–23 (citing Ex. 1003 ¶ 63).

⁴ We have updated certain of these citations to correct obvious typos in the Petition.

Patent Owner does not dispute Petitioner’s analysis of this limitation. Petitioner has shown persuasively that Leaning’s player program on the user terminal teaches the “client module” that is connected to a network and is capable of requesting digital content from a server on the network. *See, e.g.*, Ex. 1004, 4:4–15, 5:1–14, Fig. 1. We also are persuaded that, based on Leaning’s disclosures about using HTTP, an ordinarily skilled artisan would have known to implement Leaning’s player program such that it uses a TCP connection to request content from a server. *See, e.g.*, Ex. 1003 ¶¶ 60–63; Ex. 1004, 2:9–10, 2:15–16, 2:31–32. In particular, Leaning expressly references documents that became HTTP standards (Ex. 1004, 2:9–10) for which TCP is the well-known underlying network transport layer. *See, e.g.*, Ex. 1012, 31–32. This supports Dr. Houh’s un rebutted testimony that an ordinarily skilled artisan would have known to make Leaning’s HTTP requests to a webserver over a TCP connection with a reasonable expectation of success, particularly given the prevalence of using TCP. Ex. 1003 ¶¶ 62–63; *see also* Ex. 1012, 94–95 (stating that “just about all of the world’s HTTP communication is carried over TCP/IP” and that “HTTP connections really are nothing more than TCP connections, plus a few rules about how to use them”). Thus, we find that Leaning teaches or at least suggests limitation 1[A][1].

c. Limitation 1[A][2]

Claim 1 further recites that “at least two different copies of the digital content are each encoded at different bit rates and stored on the at least one server.” Ex. 1001, 18:36–38. Petitioner cites Leaning’s teaching of the server storing “**two or more versions** of the recording, recorded at **different**

compression rates (for example . . . **8, 16, 24 and 32 kbit/s respectively**).”

Pet. 23 (quoting Ex. 1004, 6:13–26) (citing Ex. 1004, 9:3–7, 16:6–12).

Patent Owner does not dispute Petitioner’s analysis. We find that Leaning teaches this limitation based on the quotations highlighted above by Petitioner.

d. Limitation 1[A][3]

Claim 1 further recites that “each copy of the digital content is divided into a plurality of streamlets, each of the plurality of streamlets of a corresponding copy comprising a different portion of the digital content during presentation.” Ex. 1001, 18:38–42. Petitioner cites Leaning’s teachings of partitioning source files into a sequence of sub-files (i.e., “streamlets”) before storage on the server. Pet. 24 (citing Ex. 1004, code (57), 3:5–6, 6:21–22). Petitioner also cites Leaning’s disclosures that “a set of files represent[s] **successive temporal portions** of the said material” and “partitioning the material into a plurality of discrete files **each representing successive temporal portions of the said material**.” *Id.* (quoting Ex. 1004, 1:3–29). Petitioner additionally cites Leaning’s teaching that each sub-file corresponds to a fixed playing time (e.g., 4 seconds). *Id.* at 24–26 (citing Ex. 1004, 3:1–22, 5:4–6:8, 6:21–7:7, 12:8–34, 13:23–14:19, p. 7 (table)).

Patent Owner does not dispute Petitioner’s analysis. We find that Leaning teaches this limitation based on the quotations highlighted above by Petitioner.

e. Limitation 1[A][4]

Claim 1 further recites that “corresponding streamlets across the at least two different copies comprise the same corresponding portions of the digital content during presentation.” Ex. 1001, 18:42–45. Petitioner cites Leaning’s teaching that each sub-file corresponds “**to a fixed playing time, perhaps four seconds,**” and that corresponding sets of sub-files encoded at different bitrates are stored in directories. Pet. 26 (quoting Ex. 1004, 3:6–7) (citing *id.* at 1:3–29, 3:5–18, 5:4–6:8, 6:21–7:2). Petitioner notes that, in the example shown in Leaning, a recording of Bach with a playing time of 9 minutes has corresponding sets of 135 sub-files encoded at each of the different bitrates. *Id.* Petitioner also cites Leaning’s disclosure that “the **sub-file boundaries are the same for each rate,** so that the first sub-file received for a new rate continues from the **same point** in the recording that the last sub-file at the old rate ended.” *Id.* at 27 (quoting Ex. 1004, 12:8–12).

Patent Owner does not dispute Petitioner’s analysis. We find that Leaning teaches this limitation based on the quotations highlighted above by Petitioner.

f. Limitation 1[A][5]

Claim 1 further recites that “the client module streams the digital content.” Ex. 1001, 18:45–46. Petitioner contends that Leaning’s player program (i.e., the “client module”) on terminal 3 streams media files. Pet. 27 (citing Ex. 1004, 4:13–15).

Patent Owner does not dispute Petitioner’s analysis. We find that Leaning teaches this limitation.

g. Limitation 1[B]

Claim 1 further recites that “requesting a first streamlet from the at least one server.” Ex. 1001, 18:47. Petitioner cites Leaning’s teachings that the “‘player program, having received the URL [uniform resource locator for server 1], adds to this filename of the first sub-file, to produce a complete address for the sub-file— i.e. www.server1.com/mp3_bwv565/000000.bin’ and ‘constructs a request message’ for first sub-file 000000.bin ‘and transmits it to the server 1.’” Pet. 27–28 (alteration added) (quoting Ex. 1004, 5:4–9). In this scenario, Petitioner maps the recited “first streamlet” to the sub-file “000000.bin.” *See id.*

Patent Owner does not dispute Petitioner’s analysis. We find that Leaning teaches this limitation.

h. Limitation 1[C][1]

Claim 1 further recites

automatically requesting from the at least one server subsequent portions of the digital content by requesting for each subsequent portion one of the streamlets from the different copies of the digital content dependent upon successive determinations by the client module to change a currently requested bit rate to a higher or lower bit rate.

Ex. 1001, 18:47–54. Building on its analysis from limitation 1[B], Petitioner cites Leaning’s teachings that the “player program increments the filename to 000001.bin and requests, receives, decodes and stores this second subfile” and then “repeats this process.” Pet. 28 (citing Ex. 1004, 5:23–24). For “successive determinations . . . to change a currently requested bit rate,” Petitioner cites Leaning’s teachings of shifting the bitrate up or down based on, *inter alia*, buffer status, current rate, and measured

rate. *Id.* at 28–29 (citing Ex. 1004, 8:17–26). Petitioner also notes Leaning’s teachings of the player program effecting rate changes by “changing the relevant part of the sub-file address for example, changing ‘008k’ to ‘024k’ to increase the data rate from 8 to 24 kbit/s and changing the current rate parameter to match” whereby “the next request to the server becomes a request for the higher (or lower) rate, and the sub-file from the new directory is received, decoded and entered into the buffer.” *Id.* at 29 (quoting Ex. 1004, 9:3–7, 9:9–11) (citing Ex. 1004, claims 4–6, 11, 12).

Patent Owner does not dispute Petitioner’s analysis. We find that Leaning teaches this limitation.

i. Limitation 1[C][2]

Claim 1 further recites “repeatedly generating a factor indicative of a current ability to receive digital content at a rate sufficient for presenting the digital content as the digital content is received.” Ex. 1001, 18:39–41. Petitioner contends that Leaning’s player program “repeatedly generates a ‘measured rate’ factor (the measured actual data rate being received from the server, averaged over a period of time) and compares it to a ‘current rate’ (the bitrate of the current sub-file being requested) to determine if the current stream is sustainable.” Pet. 30 (citing Ex. 1004, 8:7–26, claims 5, 6). Petitioner also contends that Leaning’s player program repeatedly generates a “Buffer Low Percentage,” which is “the percentage of time that the buffer contents represent less than 25% of the playout time (i.e. the buffer is getting close to being empty).” *Id.* at 30–31 (citing Ex. 1004, 8:27–28). According to Petitioner, interruption of the video stream

“can be avoided and therefore it is preferable to employ a criterion which anticipates underflow and avoids it in the

majority of cases” by omitting the first determination (whether the buffer is completely empty) and generating measured rate and Buffer Low Percentage factors as indicators of whether the current streaming rate is sustainable.

Id. at 31 (quoting Ex. 1004, 15:3–8) (citing Ex. 1003 ¶ 75–76; Ex. 1004, 8:11–11:1).

Patent Owner does not dispute Petitioner’s analysis. We are persuaded that Leaning’s player program repeatedly generates a “measured rate” and “Buffer Low Percentage,” both of which indicate the ability of the player program to receive digital content at a sufficient rate. *See, e.g.*, Ex. 1004, 8:7–11:1, 15:3–8, claims 5, 6.

j. Limitation 1[D]

Claim 1 further recites

making the successive determinations to change the digital content bit rate based on the factor using the streamlets of one of the different copies of the digital content having the highest bit rate determined receivable for presentation so that the client module selects a higher bit rate one of the different copies when the factor is greater than a first threshold and selects a lower bit rate one of the different copies when the factor is less than a second threshold.

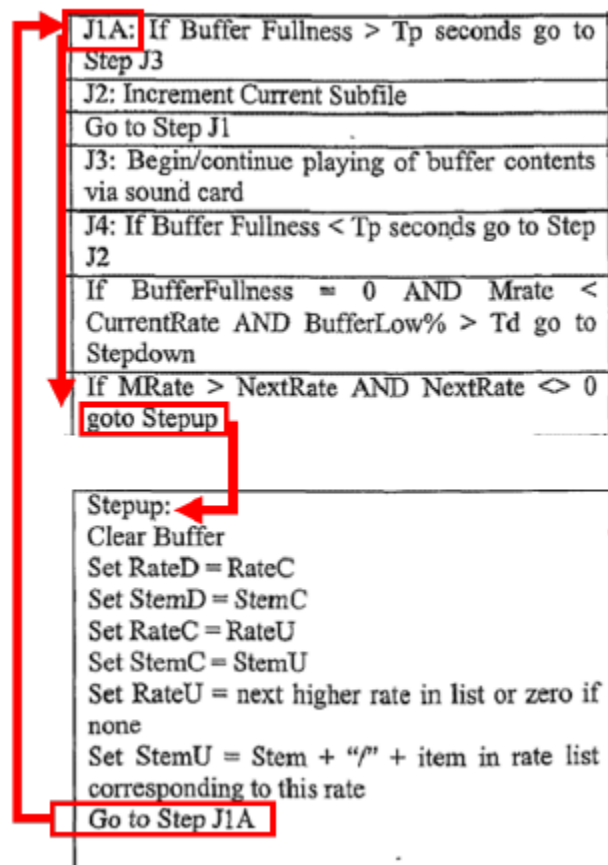
Ex. 1001, 18:59–67. Petitioner cites the same analysis from limitations 1[C][1]–1[C][2] and contends that “Leaning describes making successive determinations to change the digital content bit rate of requested sequential sub-files based on the factor (*e.g.*, ‘measured rate’).” Pet. 31–32. In particular, Petitioner cites the flowchart at pages 9–11 of Leaning and contends that

Leaning further describes requesting, or using, the streamlets (sub-files) from one of the different copies having the highest

bit rate determined receivable for presentation where the client module (*i.e.* player program) selects a higher bit rate of one of the different copies when the factor (*e.g.*, measured rate) is greater than a first threshold (*e.g.*, next highest rate) for a period of time, then shifts up until no longer true—meaning shift up to highest version possible—and selects a lower bit rate one of the different copies when the factor (*e.g.*, measured rate) is less than a second threshold (*e.g.*, current rate).

Pet. 32 (citing Ex. 1004, 9–11 (flowchart)). Petitioner also cites Leaning’s teaching that “if the measured rate exceeds not only the current rate but also **the next higher rate** for a given period of time . . . [the player program will] **increase the current rate.**” *Id.* (emphasis by Petitioner) (citing Ex. 1004, 8:24–26, 9:3–7, 9–11 (flowchart)).

To illustrate its position, Petitioner provides a figure of an annotated portion of a flowchart from Leaning, which is reproduced below.



Petitioner's figure shows a portion of Leaning's process for initiating a rate change. *See* Ex. 1004, 8–11. Referring to its figure, Petitioner asserts that “Leaning discloses looping ‘Stepup’ until the highest receivable rate is achieved up to the highest available rate (by setting RateU to zero).” Pet. 32–33 (citing Ex. 1003 ¶¶ 77–78; Ex. 1004, 10 (flowchart)). Petitioner additionally cites Leaning's explanation that “the player program downshifts to a lower quality one of the different copies when the factor is less than a second threshold (‘current rate’ (and when the Buffer Low Percentage more than a Step Down Threshold)).” *Id.* at 33–34 (citing Ex. 1003 ¶ 79; Ex. 1004, 8:17–26, claims 4–6)

Patent Owner does not dispute Petitioner's analysis of limitation 1 [D]. As discussed above, we are persuaded that Leaning teaches the recited “successive determinations” about selecting sub-files at a higher or lower bitrate and the recited “factor” (e.g., the measured rate) indicative of sufficient content reception rate. *See supra* §§ II.D.2.h, II.D.2.i. We also are persuaded that Leaning's next highest rate teaches the recited “first threshold” and Leaning's current rate teaches the recited “second threshold.” *See, e.g.,* Ex. 1003 ¶¶ 77–79; Ex. 1004, 8:17–26, 9–11 (flowchart), claims 4–6.

k. Limitation 1[E]

Claim 1 further recites “arranging the streamlets requested from the at least one server in order of ascending presentation time for output to a presentation device.” Ex. 1001, 19:1–3. Petitioner contends that “Leaning describes arranging the streamlets (sub-files) requested from the at least one server (server 1) in order of ascending presentation time” because “sub-files

are requested, received, decoded, and written to the buffer one after the other.” Pet. 34. Referring to the flowchart on page 10 of Leaning, Petitioner explains that, “[o]nce a sub-file is written to the buffer, the current sub-file number is increased (J2) and the next sub-file is requested (J1) sequentially in the order of ascending playback time (firstly sub-file 000000.bin, then sub-file 000001.bin, etc.).” *Id.* at 35 (citing Ex. 1004, 10 (flowchart)).

Thus, according to Petitioner, “the buffer will subsequently store the decoded sub-files in the corresponding order for sequential playback (in order of ascending playback time) to enable proper sequential playback of the video or audio file.” *Id.* (citing Ex. 1004, 1:13–28, 4:4–21, 5:23–6:2, 12:16–18, 14:6–11, claim 1). Regarding the recited “presentation device,” Petitioner cites Leaning’s disclosure of video display 34 and sound card 36 at the user terminal. Pet. 35 (citing Ex. 1004, 4:7–9).

Patent Owner argues that Leaning does not teach the recited “arranging” on its user terminal. PO Resp. 23. According to Patent Owner, “Leaning only discloses requesting each sub-file individually in a predefined sequence, then waiting to receive each requested sub-file before decoding and saving the sub-file in the buffer—all before requesting the next sub-file in the sequence.” *Id.* at 24 (citing Ex. 1004, 10, 14:4–13). Patent Owner also notes that “the person preparing the file for loading onto the web server” gives sub-files numerically sequential file names. *Id.* at 24–25 (citing Ex. 1004, 3:19–20). Accordingly, Patent Owner argues that Leaning’s sub-files “already are arranged in the correct order because they are requested and received in that order” and there is “no expectation” of the sub-files being received out-of-order. *Id.* at 25 (emphasis omitted) (quoting

Ex. 1004, 12:9–11). Patent Owner concludes that Leaning teaches away from the recited “arranging.” *Id.* at 26.

In its Reply, Petitioner argues that requesting and arranging sub-files in a predefined sequence is not prohibited by the claim language, particularly given the '234 patent discloses an embodiment that operates similarly. Pet. Reply 10–11 (citing Ex. 1001, 13:34–41, Fig. 7).

Patent Owner argues in its Sur-reply that claim 1 “already recite[s] ‘requesting,’ which is all that is needed to ensure sub-files are received in their ‘original sequence’ in Leaning.” PO Sur-reply 18. This, according to Patent Owner, “render[s] ‘arranging’ superfluous, which cannot be correct.” *Id.*

We do not agree with Patent Owner. Patent Owner’s arguments assume that the “arranging” limitation is not obvious unless Leaning’s system includes the ability to rearrange a group of sub-files received out-of-order. Yet “combinations of prior art that sometimes meet the claim elements are sufficient to show obviousness.” *Unwired Planet, LLC v. Google Inc.*, 841 F.3d 995, 1002 (Fed. Cir. 2016). In this case, Petitioner establishes that, in normal operation, Leaning’s system (1) requests sub-files in presentation-time order by sequential name (*see, e.g.*, Ex. 1004, 5:4–6:2, p. 10, 12:16–18); and then (2) stores the sub-files sequentially in a buffer for playback (*see, e.g., id.* at 4:16–18, 5:4–6:2, 14:6–11). We find that the act of storing the received sub-files sequentially in the buffer teaches the recited “arranging.” Furthermore, we disagree with Patent Owner (PO Sur-reply 18) that Leaning’s teaching of *requesting* sub-files in sequential

order renders superfluous Leaning’s separate teaching of *storing* received files in sequential order in a buffer.

For these reasons, we find that Leaning teaches “arranging the streamlets requested . . . in order of ascending presentation time.” We also find that Leaning’s video display and sound card at the user terminal teach the recited “presentation device” to which the arranged sub-files are outputted. *See, e.g.*, Ex. 1004, 4:7–9.

1. Secondary Considerations of Nonobviousness

Patent Owner only presents evidence of secondary considerations of nonobviousness with respect to claims 12–20. *See* PO Resp. 37. Thus, we have no such evidence to consider for claims 1–11.

m. Conclusion Regarding Claim 1

Petitioner has shown persuasively that Leaning teaches or at least suggests all limitations of claim 1. We determine that Petitioner has shown, by a preponderance of the evidence, that the subject matter of claim 1 would have been obvious over Leaning.

3. *Claim 2*

Claim 2 depends from claim 1 and recites that “at least some streamlets are requested from the at least one server via a hypertext transfer protocol (HTTP) GET request.” Ex. 1001, 19:4–6. Petitioner references its analysis for claim 1 regarding Leaning’s disclosures about media delivery using HTTP protocols. Pet. 36 (citing Ex. 1004, 2:5–32, 3:28–31); *see also*

supra § II.D.2.b (analysis regarding the use of TCP with HTTP). According to Petitioner, an ordinarily skilled artisan

would have understood Leaning’s descriptions of client end user stations making HTTP requests for sub-files from an ordinary webserver to include disclosure of HTTP GET requests for said sub-files because a POSITA would have known that HTTP/1.1 (which is cited to by Leaning) requires servers to implement the GET method and that “GET is the most common method” in HTTP and “usually is used to ask a server to send a resource.”

Pet. 36 (citing Ex. 1003 ¶¶ 82–83; Ex. 1011; Ex. 1012, 73–74; Ex. 1019, 31). Petitioner further contends that it would have been obvious

to use HTTP GET requests to request and receive sub-files from Leaning’s server because HTTP GET requests are one of a finite number of identified methods available in the HTTP protocol, and thus one of a finite number of identified predictable solutions (indeed, the only solution) for requesting files from a server with a reasonable expectation of success.

Id. (citing Ex. 1003 ¶ 84; Ex. 1011; Ex. 1019, 45–47). Petitioner also contends that an ordinarily skilled artisan reasonably would have expected success “because HTTP is a universally known and used protocol and GET requests are a standard method within that protocol for requesting files from a server.” *Id.*

Patent Owner does not dispute Petitioner’s analysis for claim 2. We are persuaded that an ordinarily skilled artisan contemplating Leaning’s teachings of delivering media via HTTP (*see, e.g.*, Ex. 1004, 2:5–32, 3:28–31) would have found it obvious to implement (and would have expected success in implementing) Leaning’s player program such that it requested sub-files using an HTTP GET request. Ex. 1003 ¶¶ 82–84. We credit Dr. Houh’s un rebutted testimony regarding the ubiquity of GET requests

within HTTP (*id.*) because is supported by the HTTP standard itself (*see* Ex. 1019, 31, 45–47) and a contemporaneous reference (*see* Ex. 1012, 73–74). Thus, we determine that Petitioner has shown, by a preponderance of the evidence, that the subject matter of claim 2 would have been obvious over Leaning.

4. *Claim 3*

Claim 3 depends from claim 1 and further recites that “the at least one server comprises at least two servers and wherein at least one streamlet is requested from a first of the at least one server and at least one other streamlet is requested from a second server of the at least one server other than the first server.” Ex. 1001, 19:7–12. Petitioner references its mapping of the “at least one server” in claim 1 to Leaning’s server 1. Pet. 20 (citing Ex. 1004, 2:15–16, 2:18–22, 2:31–32, 5:8–14, Fig. 1), 23 (citing Ex. 1004, 6:13–26, 9:3–7, 16:6–12), 37; *see supra* §§ II.D.2.b–c. Petitioner contends that, “[t]o the extent Leaning does not disclose at least two servers wherein one sub-file (streamlet) is requested from a first server and another sub-file (streamlet) is requested from a second server such an arrangement would have been obvious in view of the knowledge of a [an ordinarily skilled artisan].” *Id.* at 37. Citing the common nature of such an arrangement, Petitioner contends that an ordinarily skilled artisan

would have been motivated to provide multiple web servers containing the same sets of sub-files for streams in order to have redundancy in the system and allow for clients to establish connections with multiple servers and request a first sub-file from a first web server and, if the connection between the first web server becomes congested or the first web server otherwise fails or becomes unavailable, request a subsequent sub-file from the second web server.

Id. at 37–38 (citing Ex. 1003 ¶ 85; Ex. 1012, 108,⁵ Fig. 4-11).

Patent Owner does not dispute Petitioner’s analysis for claim 3. We are persuaded that it would have been obvious to implement Leaning’s server 1 as two servers that store different streamlets based on Dr. Houh’s uncontested testimony about system redundancy. *See* Ex. 1003 ¶ 85. His testimony is backed by a contemporaneous reference about HTTP that shows requests for different objects from different servers over parallel TCP connections. *See, e.g.*, Ex. 1012, 108–09, Fig. 4-11. Thus, we determine that Petitioner has shown, by a preponderance of the evidence, that the subject matter of claim 3 would have been obvious over Leaning.

5. *Claim 4*

Claim 4 depends from claim 1 and further recites that “the client module repeatedly generates the factor based on a moving time window.” Ex. 1001, 19:13–15. Building on its analysis of claim 1 above (*see supra* § II.D.2.i), Petitioner contends that Leaning’s measured rate (i.e., the “factor”) “is generated based upon a moving time window because Leaning describes that ‘the player program measures the actual data rate being received from the server, averaged over a period of time (for example 30 seconds)’ and the ‘accuracy of this figure improves as the number of requests goes up.’” Pet. 38–39 (quoting Ex. 1004, 8:12–15) (citing Ex. 1003 ¶ 86).

⁵ We have translated this page citation to follow Petitioner’s convention in the rest of the Petition of citing the added page numbers in the footer of each page of Exhibit 1012.

Patent Owner does not dispute Petitioner's analysis of claim 4. We find that Leaning teaches a factor (i.e., the measured rate) that is repeatedly generated (i.e., it improves with additional requests) based on a moving time window (e.g., 30 seconds). *See, e.g.*, Ex. 1004, 8:12–15. Thus, we determine that Petitioner has shown, by a preponderance of the evidence, that the subject matter of claim 4 would have been obvious over Leaning.

6. *Claim 5*

Claim 5 depends from claim 1 and recites that “the client module generates the factor based on a current read ahead margin.” Ex. 1001, 19:16–18. Building on its analysis of claim 1 above (*see supra* § II.D.2.i), Petitioner contends that Leaning's Buffer Low Percentage variable “is generated based upon a current read ahead margin (how much is in the buffer) because Leaning explains that the ‘Buffer Low Percentage is the percentage of time that the buffer contents represent less than 25% of the playout time (i.e. the buffer is getting close to being empty).’” Pet. 39 (quoting Ex. 1004, 8:27–28) (citing Ex. 1003 ¶ 87).

Patent Owner does not dispute Petitioner's analysis of claim 5. We find that Leaning teaches generating a factor based on a read-ahead margin (i.e., the Buffer Low Percentage variable). *See, e.g.*, Ex. 1004, 8:27–28. Thus, we determine that Petitioner has shown, by a preponderance of the evidence, that the subject matter of claim 5 would have been obvious over Leaning.

7. *Claim 6*

Claim 6 depends from claim 1 and recites that

a first streamlet of each copy of the digital content has the same first duration and corresponds to a same first temporal portion of the digital content, [and] a second streamlet of each copy of the digital content have the same second duration and correspond to a same second temporal portion of the digital content.

Ex. 1001, 19:19–25. Building on its analysis of limitations 1[A][3], 1[A][4], and 1[B] discussed above (*see supra* §§ II.D.2.d–f), Petitioner maps the recited “first streamlet” to Leaning’s sub-file 000000.bin and the recited “second streamlet” to Leaning’s sub-file 000001.bin and contends that “each streamlet (sub-file) across the different copies are the same duration (e.g., four seconds) and contain the same portions of the video on playback.” Pet. 39–41 (citing Ex. 1004, code (57), 1:3–29, 3:5–18, 5:4–6:8, 6:21–7:2, 12:8–20).

Patent Owner does not dispute Petitioner’s analysis of claim 6. For similar reasons to those highlighted by Petitioner for limitations 1[A][3], 1[A][4], and 1[B] above (*see supra* §§ II.D.2.d–f) as applied to more than one sub-file (*see, e.g.*, Ex. 1004, 3:5–18, 5:4–6:8), we find that that Leaning teaches the additional limitations in claim 6. Thus, we determine that Petitioner has shown, by a preponderance of the evidence, that the subject matter of claim 6 would have been obvious over Leaning.

8. Claim 7

Claim 7 depends from claim 6 and recites that “the first and second duration of the first streamlets of each copy are different from the durations of the second streamlets of each copy.” Ex. 1001, 19:26–29. Petitioner cites Leaning’s teaching that “[t]o arrange that every sub-file should represent the same fixed time period (e.g. the. 4 seconds 20 mentioned above) is not the

only way of achieving [rate switching].” *See id.* (partially quoting Ex. 1004, 12:18–20). Petitioner further cites Leaning’s teaching that each sub-file “can be a fixed number of bits, or a fixed playing time length (or neither of these).” Pet. 41 (quoting Ex. 1004, 12:12).

Patent Owner does not dispute Petitioner’s analysis of claim 7. We find that Leaning teaches or at least suggests two sub-files having different durations. *See, e.g.*, Ex. 1004, 12:12, 12:18–20. Thus, we determine that Petitioner has shown, by a preponderance of the evidence, that the subject matter of claim 7 would have been obvious over Leaning.

9. *Claim 8*

Claim 8 depends from claim 6 and recites that “each of the first streamlets has a first duration that is a range of 0.1 to 5 seconds. Ex. 1004, 19:30–32. Petitioner cites Leaning’s teaching of sub-files being four seconds in length. Pet. 42 (citing Ex. 1004, 12:16–20, Fig. 4); *see also supra* §§ II.D.2.d–e.

Patent Owner does not dispute Petitioner’s analysis of claim 8. We find that Leaning teaches the added limitation in claim 8. *See, e.g.*, Ex. 1004, 3:5–10, 12:16–20, Fig. 4. Thus, we determine that Petitioner has shown, by a preponderance of the evidence, that the subject matter of claim 8 would have been obvious over Leaning.

10. *Claim 9*

Claim 9 depends from claim 1 and recites

the client module is further configured to transmit at least one virtual timeline request to retrieve a virtual timeline corresponding to the digital content and to receive the virtual

timeline from the at least one server, and arrange the streamlets requested from the at least one server using the virtual timeline.

Ex. 1001, 19:33–38. Regarding the recited “virtual timeline,” Petitioner cites Leaning’s teaching that “the web server stores one or more **(html) menu pages (e.g. menu.htm)** containing a **list of recordings available, with hyperlinks to the corresponding link pages.**” Pet. 43 (quoting Ex. 1004, 4:1–3). Petitioner explains that Leaning’s menu is a playlist “because it provides a list of available recordings that a user could watch in succession.” *Id.* at 44. Petitioner further cites Leaning’s teaching that the client module “‘retrieve[s] and display[s] the menu page menu.htm from the server 1’ such that selection of a hyperlink ‘causes the browser to retrieve from the server, and display, the link page for the desired recording.’” *Id.* at 43 (quoting Ex. 1004, 4:22–34) (citing *id.* at 9:3–11:1). For “arrang[ing] the streamlets . . . using the virtual timeline,” Petitioner cites its analysis from limitation 1[E] and argues that “Leaning describes arranging the sub-files for playback in sequential order.” *Id.* at 44 (citing Ex. 1003 ¶¶ 92–93); *see also supra* § II.D.2.k.

According to Patent Owner, “Leaning fails to disclose or suggest that its user terminal (purported ‘client module’) actively ‘arrange[s]’ content based on a ‘virtual timeline,’ including under Petitioner’s construction of the term ‘virtual timeline.’” PO Resp. 33. Specifically, Patent Owner argues that Leaning’s menu page only amounts to a link to the desired recording and, as such, “does not relate to sub-files (purported ‘streamlets’), nor is it used to ‘arrange’ sub-files, as Claim 9 requires.” *Id.* Patent Owner additionally argues that Leaning’s terminal “does not need any additional information from the menu page to request and receive every sub-file in a content file.” *Id.* at 33–34 (citing Ex. 1004, 3:10–20; 5:4–8).

As noted by Petitioner, however, Patent Owner does not appear to dispute that “Leaning’s client module *requests* and *receives* a virtual timeline (‘menu.htm’ and/or index file *e.g.* “http:\\server1.com/mp3_bwv565_link.htm’).” Pet. Reply 18; *see also* Pet. 43 (citing Ex. 1004, 4:1–3, 4:22–34, 9:3–11:1). Patent Owner only seems to dispute that the alleged “virtual timeline” is used to “arrange the streamlets requested from the at least one server” as is also recited in claim 9. And, as further noted by Petitioner, Patent Owner acknowledges that Leaning’s terminal uses the received URL to produce an address for a sub-file by “append[ing] the next sub-file name to the URL from the virtual timeline.” *Id.* at 18–19 (citing PO Resp. 34; Ex. 1004 5:4–6; Ex. 1022 ¶¶ 39–41). That process was described above with respect to limitation 1[E]. *See supra* § II.D.2.k. Thus, for reasons similar to those discussed above, we are persuaded by Petitioner’s analysis because a link from Leaning’s menu page (i.e., the “virtual timeline”) is used to create URLs for sub-files by changing the link’s URL to reflect the next sub-file name. We find that this is commensurate with the recited “arrang[ing]” of streamlets.

For these reasons, we determine that Petitioner has shown, by a preponderance of the evidence, that the subject matter of claim 9 would have been obvious over Leaning.

11. Claim 10

Claim 10 depends from claim 1 and recites that “the client module is further configured to output the streamlets requested from the at least one server to the presentation device in the order of ascending presentation time.” Ex. 1001, 19:39–42. Petitioner cites Leaning’s teaching of

“outputting to a presentation device (*e.g.*, video display 34 and audio interface (‘sound card’) 36.” Pet. 44–45 (citing Ex. 1004, 4:7–9). Patent Owner does not dispute Petitioner’s analysis of claim 10. We find that Leaning teaches the client module outputting to a presentation device. *See, e.g.*, Ex. 1004, 4:7–9. We already have analyzed the “ascending presentation time” aspect with respect to claim 1. *See supra* § II.D.2.k. Thus, we determine that Petitioner has shown, by a preponderance of the evidence, that the subject matter of claim 10 would have been obvious over Leaning.

12. *Claim 11*

Claim 11 depends from claim 1 and further recites “the presentation device to display the streamlets in the order of ascending presentation time.” Ex. 1001, 19:43–45. Petitioner cites Leaning’s teaching of “outputting to a presentation device (*e.g.*, video display 34 and audio interface (‘sound card’) 36.” Pet. 45 (citing Ex. 1004, 4:7–9). Patent Owner does not dispute Petitioner’s analysis of claim 11. We find that Leaning teaches a presentation device for displaying output. *See, e.g.*, Ex. 1004, 4:7–9. We already have analyzed the “ascending presentation time” aspect with respect to claim 1. *See supra* § II.D.2.k. Thus, we determine that Petitioner has shown, by a preponderance of the evidence, that the subject matter of claim 11 would have been obvious over Leaning.

13. *Claim 12*

Petitioner's unpatentability contentions for independent claim 12 rely mostly on its analysis from claim 1. *See* Pet. 45–49. We focus on limitation 12[D], which recites:

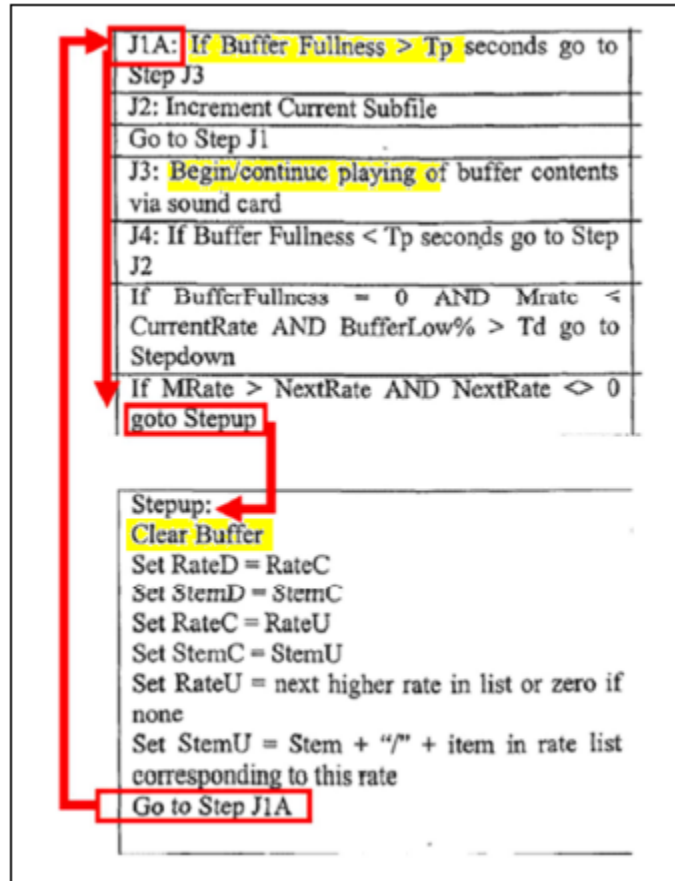
making the successive determinations whether to change the requested bit rate based on the factor to achieve continuous presentation of the digital content using the individually-requestable portions of the highest bit rate one of the copies determined receivable at that time at a rate sufficient for presenting the digital content as the individually-requestable portions of the digital content are received, wherein the making of the successive determinations to change the requested bit rate comprises:

requesting a subsequent individually-requestable portion from a higher bit rate one of the different copies than a currently requested one of the different copies when the at least one factor is greater than a first threshold; and

requesting a subsequent individually-requestable portion from a lower bit rate one of the different copies than the currently requested one of the different copies when the at least one factor is less than a second threshold.

Ex. 1001, 20:11–29. Petitioner relies specifically on the analysis from limitation 1[D]. Pet. 49. Petitioner also notes in its Reply that the analysis for limitation 1[D] expressly incorporates aspects of its analysis from limitations 1[C][1]–1[C][2]. Pet. Reply 14 (citing Pet. 28–32, 49).

Patent Owner argues that “Leaning requires non-continuous, rather than continuous, presentation of digital content.” PO Resp. 18. To illustrate its position, Patent Owner provides an annotated version of Petitioner's figure (which is based on Leaning's flowchart for initiating a rate change), which is reproduced below. *Id.* at 19 (citing Pet. 33).



PO Resp. 19. Patent Owner’s figure, which is based on Petitioner’s figure (see Pet. 33), shows a portion of Leaning’s process for initiating a rate change. See Ex. 1004, 8–11. Referring to its figure, Patent Owner asserts that “the yellow highlighted portions . . . establish that *every time* Leaning performs the purported upshift, at the ‘Stepup’ routine, it clears the buffer (‘Clear Buffer’) and then *waits* until the buffer is refilled (‘If Buffer Fullness > Tp’) before resuming playback (‘Begin/continue playing’).” PO Resp. 19–20. Patent Owner further asserts that “during *every shift*, Leaning consistently teaches clearing the buffer then restarting the process to re-fill the buffer with Tp seconds of content,” which “causes the loss of audio content and introduces both temporal and content discontinuities.” *Id.* at 20 (citing Ex. 2141 ¶ 72); see also *id.* at 15–17 (describing a “content-based

discontinuity” due to purging of the buffer); PO Sur-reply 10–11 (similar argument). Thus, according to Patent Owner, “Petitioner’s own [figure] shows that Leaning’s playback is **not** ‘continuous,’ during a rate shift, as required by element 12[E].” PO Resp. 20.

Petitioner counters that the Petition did in fact address the “continuous presentation” limitation via various cross-references. Pet. Reply 13–14. In particular, Petitioner notes the Petition’s citation of Leaning’s teaching “‘that **interruption**’ of the video stream ‘can be **avoided** and therefore it is **preferable** to employ a criterion which **anticipates underflow and avoids it** in the majority of cases.’” *Id.* at 14 (emphasis by Petitioner) (quoting Pet. 31). Petitioner also notes the Petition’s citation of Leaning’s claims 4–6, which allegedly “teach continuous presentation when rate switching by requesting for playback sub-files of a different rate **immediately following the last sub-file requested** and each do not mention clearing a buffer.” *Id.* (emphasis by Petitioner) (citing Pet. 33–34).

Petitioner also argues that Patent Owner is wrong to suggest that Leaning requires clearing the buffer upon every rate switch. Pet. Reply 3–9. Petitioner argues that Leaning’s discussion of clearing the buffer pertains to older sound cards, and that even older sound cards could avoid clearing the buffer “[b]y running the sound card at the highest sampling rate possible and up-sampling sub-files before or after buffering.” *Id.* at 3–4 (citing Ex. 1004, 14:25–33; Ex. 1022 ¶¶ 13–17). Petitioner also cites Leaning’s teaching that “[i]n the case of rate switching, it is, if not actually essential, highly desirable that the sub-file boundaries are the same for each rate, so that the first sub-file received for a new rate **continues from the same point in the**

recording that the last sub-file at the old rate ended.” *Id.* at 9 (emphasis and alteration by Petitioner) (quoting Ex. 1004, 12:16–18).

In addition, Petitioner reiterates Leaning’s express teachings on how its disclosed audio streaming principles may be applied to video streaming using, for example, MPEG-formatted video. Pet. Reply 5–6 (citing, *inter alia*, Ex. 1004, 16:6–10). As part of this, Petitioner posits that MPEG video would be encoded such that “each video sub-file should begin with an I-frame to avoid decoding errors when rate-switching between copies” and would be “decoded using software incorporated into the player program.” *Id.* at 5 (citing Ex. 1004, 16:17–23; Ex. 1022 ¶ 19). Thus, Petitioner argues, “it would not make sense to clear the buffer because there would be no video card that required re-setting and no interruptions upon rate switching since every sub-file begins with an independently decodable I-frame.” *Id.* (citing Ex. 1022 ¶ 22). According to Petitioner, this undermines Dr. Jeffay’s assertions that video cards would need to be “cleared and reset in order to decode video.” *Id.* at 6 (citing Ex. 2141 ¶¶ 89–90).

In its Sur-reply, Patent Owner argues that “beginning each sub-file with an I-Frame is not enough to avoid content-based interruptions, such as ‘mistracking.’” PO Sur-reply 14 (citing Ex. 2141 ¶¶ 166–170). Patent Owner explains that “the sub-files would still include intermediary frames—specifically, B-frames and P-frames—that carry dependences across different bit rates, resulting in a mix of bit rates at the beginning of a decoded segment.” *Id.* (citing Ex. 2141 ¶ 169). Patent Owner also notes that “individual frames within a subfile would need to be rearranged for presentation since they are received in a different order.” *Id.* at 14–15 (citing Ex. 2141 ¶¶ 167–169). Considering these factors, Patent Owner

argues that “Leaning’s suggestion to ‘begin [each sub-file] with an [I-Frame]’ falls short of disclosing a functional solution for encoding video.” *Id.* (citing Ex. 2141 ¶ 166). Patent Owner also calls this an improper new argument that was not disclosed in the Petition. *See id.* at 10, 14–15

Having considered the entire trial record, we agree with Patent Owner that Petitioner has not carried its burden of persuasion as to the “continuous presentation” recitation in limitation 12[D]. In response to Patent Owner’s assertions about playback discontinuities in Leaning (*see, e.g.*, PO Resp. 12–20), Petitioner relies specifically on a disclosure in Leaning about using I-frames to start each sub-file. *See* Pet. Reply 5 (citing Ex. 1004, 16:17–23; Ex. 1022 ¶ 19). But this disclosure from Leaning does not overcome Dr. Jeffay’s unrebutted testimony that “the results would still include mistracking at the decoder if a video is divided into sub-files with an I-frame at the beginning of each sub-file.” Ex. 2141 ¶ 169. Dr. Jeffay explains that mistracking is caused by B-frames and P-frames within a sub-file that carry dependences across different bit rates when there is a rate shift. *Id.* And, at his deposition, Dr. Houh acknowledged the potential of a discontinuity when there is a rate shift and “the I frame is not the very first frame of the switched subfile.” *See* Ex. 2129, 107:11–109:25. Dr. Houh said that “one example way to deal with it would be that you could *simply skip past any frames dependent on other frames* until you reach the next I frame” (*id.* at 109:9–25 (emphasis added)), which supports Patent Owner’s arguments about discontinuities.

Moreover, Petitioner’s reply theory about starting each sub-file with an I-frame is barely developed in Petitioner’s papers. The Petition is silent regarding the use of I-frames, and it does not cite the portions of Leaning

that detail the same. *See* Pet. 20 (citing but not discussing Ex. 1004, 16:6–10, which merely names the video encoding standards H.261 and MPEG). Petitioner’s Reply is where Petitioner first proposes starting each sub-file with an I-frame (Pet. Reply 5),⁶ which is undeniably taught by Leaning. *See* Ex. 1004, 16:17–23. Yet Petitioner makes no attempt to rebut Dr. Jeffay’s testimony about discontinuities in that scenario, which was already in the record at that juncture. *See* Ex. 2141 ¶¶ 166–169. And Dr. Houh’s supporting testimony merely parrots Petitioner’s scant argument from its Reply, so it does nothing to overcome Dr. Jeffay’s testimony.

We acknowledge that Leaning includes other teachings on how to encode videos, such as coding each frame independently. *See* Ex. 1004, 16:16–20. By the plain language of Leaning, such a scheme overcomes various “further implications for file partitioning if switching or jumps are to be permitted.”⁷ *Id.* But Petitioner does not rely on that scheme.

For these reasons, and based on the record developed in this case, we find that Petitioner has not persuasively shown that Leaning teaches the

⁶ We do not decide whether Petitioner has improperly introduced a new theory in its Reply (*see, e.g.*, Strike Mot. 6–7) because its theory is not persuasive on this record. *See infra* § II.G.

⁷ We note that, based at least in part on this teaching, the panels in IPR2024-00917, IPR2024-00918, and IPR2024-00919 reached different outcomes compared to this case. Notably, the petitioner in those cases relied on, *inter alia*, an independent coding theory to overcome Patent Owner’s arguments in those cases. Dr. Houh also provided extensive reply testimony in those cases responding to Dr. Jeffay’s testimony about discontinuities in Leaning’s system. Dr. Houh did not provide similar testimony in this case.

“continuous presentation” recitation of limitation 12[D].⁸ Thus, we determine that Petitioner has not shown by a preponderance of the evidence that the subject matter of claim 12 would have been obvious over Leaning.

14. Claims 13–20

Claims 13–20 each depend from claim 12. Ex. 1001, 20:37–21:5. Petitioner’s further analysis for these claims based on Leaning does not cure the deficiencies discussed above with respect to claim 12. *See* Pet. 50–52. Thus, we determine Petitioner has not shown by a preponderance of the evidence that the subject matter of claims 13–20 would have been obvious over Leaning.

E. Obviousness Grounds Based on Leaning and Klemets

Petitioner contends the subject matter of claims 1–15 and 17–20 would have been obvious over the combination Leaning and Klemets. Pet. 52–55; Pet. Reply 18–19. Patent Owner disputes Petitioner’s analysis for claim 9. PO Resp. 32–37.

1. Klemets

Klemets is a U.S. patent application publication directed to “client-side caching of streaming media content.” Ex. 1006 ¶ 1. Klemets teaches that a “piece of media content” (e.g., audio and/or video content for a song) may include multiple streams encoded at a particular bit rate. *Id.* ¶¶ 36, 38.

⁸ We do not evaluate Patent Owner’s evidence of secondary considerations of nonobviousness (*see* PO Resp. 37–61; PO Sur-reply 21–26) given this finding.

This allows for “selection of different combinations of these streams for playback by [a] media player” based on, for example, user preferences, available network bandwidth, and a desired bit rate for particular content. *Id.* ¶ 39. Streaming media communications can occur using a version of the HTTP using TCP data delivery. *Id.* ¶¶ 30, 99.

Petitioner contends that Klemets qualifies prior art under 35 U.S.C. § 102(e) based on its filing date. Pet. 17. Patent Owner does not contest the prior art status of Klemets.

We have no evidence of an invention date other than the earliest possible effective filing date of the challenged claims. We determine that Klemets qualifies as prior art under 35 U.S.C. § 102(e) because Klemets’s filing date of June 24, 2002, is before the earliest effective filing date of the challenged claims, which is April 30, 2004. Ex. 1001, code (60); Ex. 1006, code (22).

2. *Claim 1*

Building on its contentions for claim 1 (limitation 1[A][1]) in the Leaning ground, Petitioner cites Klemets “[t]o the extent it is argued that Leaning does not explicitly disclose or suggest making HTTP requests via at least one transmission control protocol (TCP) connection.” Pet. 52–53. In particular, Petitioner cites Klemets’s teaching of “requesting and receiving streaming media from servers via ‘HTTP . . . using TCP (Transmission Control Protocol) data delivery.’” *Id.* at 53 (quoting Ex. 1006⁹ ¶ 99). Petitioner contends that an ordinarily skilled artisan

⁹ Petitioner mistakenly cites to Klemets as Exhibit 1005, but Klemets is actually located at Exhibit 1006. We have updated the citations accordingly.

would have been motivated to modify Leaning such that Leaning's HTTP requests to an ordinary webserver were made via at least one transmission control protocol (TCP) connection, as taught by [Klemets], because essentially all such HTTP requests were made via at least one TCP connection at the time and because, beneficially, TCP connections were not typically blocked by firewalls.

Id. (citing Ex. 1003 ¶ 115). Petitioner also contends an ordinarily skilled artisan reasonably would have expected success in making this modification “because essentially all HTTP runs over TPC connections.” *Id.*

Patent Owner does not dispute Petitioner's further analysis for claim 1 based on combining Klemets with Leaning. We are persuaded that an ordinarily skilled artisan would have implemented Leaning's HTTP requests using a TCP connection based on Klemets's teachings, and reasonably would have expected success in doing so. *See, e.g.*, Ex. 1003 ¶ 115; Ex. 1006 ¶ 99. Thus, we determine that Petitioner has shown by a preponderance of the evidence that the subject matter of claim 1 would have been obvious over the combination of Leaning and Klemets.

3. *Claim 3*

Building on its analysis for claim 3 in the Leaning ground, Petitioner additionally cites Klemets's teaching that, in addition to an origin server, “[o]ne or more proxy servers . . . may be part of the network 106, and requests from client device 102 and responses to the client device 102 may be sent to and received from such a proxy server(s).” Pet. 53–54 (quoting Ex. 1006 ¶ 25). Petitioner also cites Klemets's teaching that a client may access multiple servers. *Id.* at 54 (citing Ex. 1006 ¶ 28). According to Petitioner, an ordinarily skilled artisan

would have been motivated to provide multiple web servers containing the requestable same sets of sub-files for streams, as taught by [Klemets], in order to have redundancy in the system and allow for clients to establish connections with multiple servers and request a first sub-file from a first web server and, if the connection between the first web server becomes congested or the first web server otherwise fails or becomes unavailable, request a subsequent sub-file from the second web server.

Id. (citing Ex. 1003 ¶ 116). Petitioner also argues that an ordinarily skilled artisan reasonably would have expected success in making the modification “because it would have been a simple matter of storing the same files on multiple servers.” *Id.*

Patent Owner does not dispute Petitioner’s further analysis for claim 3 based on combining Klemets with Leaning. We find that Klemets teaches a client accessing more than one server, including proxy servers. *See, e.g.*, Ex. 1006 ¶¶ 25, 28. We also are persuaded that an ordinarily skilled artisan would have implemented Klemets’s teachings about using multiple web servers in Leaning’s system for sake of redundancy and would have expected success given that it only would have required replicating the same files across the web servers. *See, e.g.*, Ex. 1003 ¶ 116. Thus, we determine that Petitioner has shown by a preponderance of the evidence that the subject matter of claim 3 would have been obvious over the combination of Leaning and Klemets.

4. Claim 9

Building on its analysis for claim 9 in the Leaning ground, Petitioner cites Klemets’s teaching of “generating a playlist of entire content files such as ‘twenty . . . songs to be part of a play list, and subsequently have those songs played back . . . by selecting playback of the play list.’” Pet. 55

(quoting Ex. 1006 ¶ 41). Petitioner also cites Klemets's teaching of "streaming media player 142 indicat[ing] to streaming module 144 that the player is ready for the next piece of content in the play list. . . . by communicating a 'stream next entry' command to streaming module 144." *Id.* (quoting Ex. 1006 ¶ 68). Petitioner contends that an ordinarily skilled artisan

would have been motivated to create a virtual timeline playlist of entire content files that play one after the other, as taught by [Klemets], in order to set out a schedule of similar recordings for clients to play sequentially in succession so that the presentation is made in the order as originally intended instead of a random or different order.

Id. (citing Ex. 1003 ¶ 119). Petitioner also contends that an ordinarily skilled artisan reasonably would have expected success combining Klemets with Leaning because both references "are drawn to similar systems of client-server based streaming and generating a playlist of entire content files would have been a straightforward modification." *Id.*

Patent Owner disputes that Klemets teaches "'arranging' sub-files using a 'virtual timeline' because Klemets does not disclose any 'sub-files' to begin with." PO Resp. 37 (citing Ex. 2141 ¶ 144). Patent Owner does not dispute Petitioner's reasons for combining Klemets with Leaning.

We are persuaded by Petitioner's further contentions based on Klemets for teaching a "play list . . . of one or more items each of which is a particular piece of content to be streamed." *Id.* Ex. 1006 ¶ 41. Klemets also teaches sequential playback of those items simply by selecting the list (*see id.*), which is commensurate with the recited arranging of streamlets. We also are persuaded by Petitioner's contentions that an ordinarily skilled artisan would have known to implement Klemets's play list in Leaning's

system with a reasonable expectation of success. *See, e.g.*, Ex. 1003 ¶ 119. Thus, we determine that Petitioner has shown by a preponderance of the evidence that the subject matter of claim 9 would have been obvious over the combination of Leaning and Klemets.

5. *Claims 2, 4–8, 10, and 11*

Claims 2, 4–8, 10, and 11 depend directly or indirectly from claim 1. Petitioner does not put forth any further contentions based on Klemets specific to these claims. Notwithstanding, given the dependencies of claims 2, 4–8, 10, and 11, Petitioner necessarily relies on its analysis of claim 1 based on Leaning and Klemets, as discussed above. *See supra* § II.E.2. For the same reasons discussed above with respect to claim 1 (*see id.*) and from claims 2, 4–8, 10, and 11 in the Leaning ground (*see supra* §§ II.D.2, 5–9, 11, 12), we are persuaded by Petitioner’s contentions. Thus, we determine that Petitioner has shown by a preponderance of the evidence that the subject matter of claims 2, 4–8, 10, and 11 would have been obvious over the combination of Leaning and Klemets.

6. *Claims 12–20*

Petitioner’s further analysis for claims 12–20 based on Klemets does not cure the deficiencies discussed above from the Leaning ground with respect to claim 12. *See supra* § II.D.13. Thus, we determine Petitioner has not shown by a preponderance of the evidence that the subject matter of claims 12–20 would have been obvious over the combination of Leaning and Klemets.

F. Obviousness Grounds Based on “Leaning (with or without [Klemets]) and Gamble”

Petitioner contends the subject matter of claim 16 would have been obvious over the combinations of (1) Leaning and Gamble; or (2) Leaning, Klemets, and Gamble. Pet. 56–58; Pet. Reply 16–18. Patent Owner disputes Petitioner’s contentions. PO Resp. 26–32; PO Sur-reply 19–20.

1. Gamble

Gamble is a U.S. patent application publication directed to “transferring large data files over parallel connections.” Ex. 1020 ¶ 1. In particular, Gamble teaches the use of multiple parallel connections for transferring data from a server to a client on the Internet using Transfer Control Protocol/Internet Protocol (TCP/IP) protocol layers. *Id.* ¶¶ 8, 34, 50. The TCP layer sequences and reorders data packets and ensures that packets are received at the client. *Id.* ¶¶ 36–37. Standard TCP congestion protocols can be implemented on a per-connection basis for the client. *Id.* ¶ 52.

2. Claim 16

Claim 16 depends from claim 12. Ex. 1001, 20:51–58. Petitioner’s further contentions based on Gamble for claim 16 do not address the “continuous presentation” limitation of claim 12, so they do not cure the deficiencies discussed above from the Leaning ground with respect to claim 12. *See supra* § II.D.13. Thus, we determine Petitioner has not shown by a preponderance of the evidence that the subject matter of claims 16 would have been obvious over the combination of Leaning with or without Klemets and Gamble.

G. Patent Owner's Motion to Strike

Patent Owner moves to strike portions of Petitioner's Reply and Dr. Houh's Reply Declaration related to the "continuous presentation" limitation in claim 12. Strike Mot. 1. Specifically, Patent Owner argues that Petitioner belatedly presented a new claim construction for the "continuous presentation" limitation and offered untimely new theories supporting its unpatentability contentions for this limitation. *Id.* at 2–8, 10; Strike Reply 1–5. We do not adopt Petitioner's new claim construction. *See supra* § II.C.2. We also are not persuaded by Petitioner's unpatentability contentions for claim 12 even if we were to consider the theories presented in Petitioner's Reply. *See supra* § II.D.13. Thus, we dismiss as moot these aspects of Patent Owner's Motion to Strike.

Patent Owner also argues that Petitioner introduces an improper new argument in its Reply relative to the "arranging" limitation of claim 1 (i.e., limitation 1[E]). Strike Mot. 7–8 (citing Pet. Reply 11); Strike Reply 4–5. Specifically, Patent Owner argues that Petitioner previously had not relied on Leaning's disclosure of arranging sub-files based on "play time" rather than file name. Strike Mot. 9–10 (citing Pet. Reply 11; Ex. 1004, 21:30–22:3). We do not rely on this disclosure in finding that Leaning teaches limitation 1[E]. *See supra* § II.D.2.k. Thus, we dismiss as moot this aspect of Patent Owner's Motion to Strike.

H. Petitioner's Motion to Exclude

Petitioner moves to exclude the following information under 37 C.F.R. § 42.64(c): (1) a collection of email chains from non-declarants and third parties at Exhibits 2041–2043, 2059, 2067, 2081, 2088, 2089, and

2091; and (2) a citation to a prior declaration from Dr. Houh in an unrelated case that has not been filed in this proceeding. Exclude Mot. 1 & n.1. All of this evidence pertains to Patent Owner's evidence of secondary considerations of nonobviousness for claims 12–20, which we do not reach. Thus, we dismiss as moot Petitioner's Motion to Exclude.

III. CONCLUSION¹⁰

Petitioner has shown, by a preponderance of the evidence, that (1) the subject matter of claims 1–11 of the '234 patent would have been obvious over Leaning; and (2) the subject matter of claims 1–11 of the '234 patent would have been obvious over the proposed combination of Leaning and Klemets. Petitioner has not shown, by a preponderance of the evidence, that (3) the subject matter of claims 12–15 and 17–20 of the '234 patent would have been obvious over Leaning; (4) the subject matter of claims 12–15 and 17–20 of the '234 patent would have been obvious over the proposed combination of Leaning and Klemets; (5) the subject matter of claim 16 of the '234 patent would have been obvious over the proposed combination of Leaning and Gamble; and (6) the subject matter of claim 16 of the

¹⁰ Should Patent Owner wish to pursue amendment of the challenged claims in a reissue or reexamination proceeding subsequent to the issuance of this Decision, we draw Patent Owner's attention to the April 2019 *Notice Regarding Options for Amendments by Patent Owner Through Reissue or Reexamination During a Pending AIA Trial Proceeding*. See 84 Fed. Reg. 16,654 (Apr. 22, 2019). If Patent Owner chooses to file a reissue application or a request for reexamination of the challenged patent, we remind Patent Owner of its continuing obligation to notify the Board of any such related matters in updated mandatory notices. See 37 C.F.R. § 42.8(a)(3), (b)(2).

'234 patent would have been obvious over the proposed combination of Leaning, Klemets, and Gamble.

We dismiss-as-moot Patent Owner's Motion to Strike and Petitioner's Motion to Exclude.

In summary:

Claim(s)	35 U.S.C. §	Reference(s)/Basis	Claim(s) Shown Unpatentable	Claim(s) Not shown Unpatentable
1–15, 17–20	103(a)	Leaning	1–11	12–15, 17–20
1–15, 17–20	103(a)	Leaning, Klemets	1–11	12–15, 17–20
16	103(a)	Leaning, Gamble		16
16	103(a)	Leaning, Klemets, Gamble		16
Overall Outcome			1–11	12–20

IV. ORDER

Accordingly, it is

ORDERED that claims 1–11 of the '234 patent are unpatentable;

FURTHER ORDERED that claims 12–20 of the '234 patent have not been shown to be unpatentable;

FURTHER ORDERED that Patent Owner's Motion to Strike (Paper 50) is *dismissed-as-moot*;

FURTHER ORDERED that Petitioner's Motion to Exclude (Paper 57) is *dismissed-as-moot*; and

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

IPR2024-00940
Patent 11,991,234 B2

PETITIONER:

Frank Gasparo
Ian Paquette
VENABLE LLP
fmgasparo@venable.com
igpaquette@venable.com

PATENT OWNER:

Eliot Williams
Ali Dhanani
George Guy
Thomas Carter
BAKER BOTTS L.L.P.
eliot.williams@bakerbotts.com
ali.dhanani@bakerbotts.com
hop.guy@bakerbotts.com
thomas.carter@bakerbotts.com