

IPR2025-00775
U.S. Patent No. 10,771,849 B2

UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE PATENT TRIAL AND APPEAL BOARD

Google LLC,
Petitioner

v.

Withrow Networks Inc.
Patent Owner

IPR2025-00775

U.S. Patent No. 10,771,849 B2
Issue Date: September 8, 2020

Title: MULTIMEDIA SYSTEM FOR MOBILE CLIENT PLATFORMS

PETITIONER'S REPLY TO PATENT OWNER'S RESPONSE

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1003	U.S. Patent No. 6,389,473 to Sharon Carmel et al. (filed Mar. 24, 1999, issued May 14, 2002) (“Carmel”)
1004	Marco Mattavelli, Sylvain Brunetton, <i>Computational Graceful Degradation for Video Decoding</i> , Signal Processing IX Theories and Applications, Proceedings of Eusipco-98 Ninth European Signal Processing Conference (1998) (“Mattavelli”)
1005	Excerpts from John Watkinson, The MPEG Handbook, MPEG-1, MPEG-2, MPEG-4 (2001) (“Watkinson”)
1006	Excerpts from David Gourley et al., HTTP: The Definitive Guide (2002) (“Gourley et al.”)
1007	Shih-Hao Wang et al., <i>A Platform-Based MPEG-4 Advanced Video Coding (AVC) Decoder with Block Level Pipelining</i> , Proc. of the 2003 Joint Conference of the Fourth International Conference on Information, Communications & Signal Processing and Fourth Pacific-Rim Conference on Multimedia Vol. 1, (ICICS-PCM 2003) (“Wang”)
1008	Prosecution History for U.S. Patent No. 10,771,849
1009	U.S. Patent No. 5,841,432 to Sharon Carmel et al. (filed Feb. 9, 1996, issued Nov. 24, 1998) (“Carmel ’432”)
1010	U.S. Patent No. 6,397,230 to Sharon Carmel et al. (filed Aug. 27, 1997, issued May 28, 2002) (“Carmel ’230”)
1011	Microsoft Computer Dictionary (5th Ed. 2002) (excerpted)

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1012	U.S. Patent No. 7,359,004 to Keman Yu et al. (filed May 23, 2003, published as U.S. Patent Publication No. 2004/0233844 on Nov. 25, 2004, issued Apr. 15, 2008) (“Yu ’004”)
1013	U.S. Patent Application Publication No. US 2002/0131768 to Robert S. Gammenthaler (filed Mar. 19, 2001, published Sept. 19, 2002) (“Gammenthaler”)
1014	A Guide to MPEG Fundamentals and Protocol Analysis (Including DVB and ATSC), Tektronix (2000)
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1019	Joseph Y. Hui et al., <i>Client-Server Synchronization and Buffering for Variable Rate Multimedia Retrievals</i> , 14 IEEE Journal on Selected Areas in Communications 226 (Jan. 1996) (“Hui et al.”)
1020	Excerpts from Peter Symes, Digital Video Compression (2004) (“Symes”)
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1022	Excerpts from Craig Hunt and Robert Bruce Thompson, Windows NT TCP/IP Network Administration (1998) (“Hunt et al.”)
1023	Excerpts from Douglas E. Comer, Internetworking with TCP/IP Vol. 1: Principles, Protocols, and Architectures (4th ed. 2000)
1024	U.S. Patent No. 6,408,096 to Thiow Keng Tan (filed Oct. 21, 1998, issued June 18, 2002) (“Tan”)
1025	U.S. Patent Application Publication No. 2005/0102371 to Emre Aksu (filed Nov. 7, 2003, published May 12, 2005) (“Aksu”)
1026	U.S. Patent No. 6,707,944 to Young Kwon Lim et al. (filed Apr. 14, 1998, issued Mar. 16, 2004) (“Lim”)
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1028	Excerpts from Iain E. G. Richardson, H.264 and MPEG-4 Video Compression: Video Coding for Next-generation Multimedia (2003) (“Richardson”)
1029	Arnaud Bourge and Joel Jung, <i>Low-power H.264 video decoder with graceful degradation</i> , Visual Communications and Image Processing 2004, 5308 Proceedings of SPIE-IS&T Electronic Imaging 372 (2004) (“Bourge”)
1030	U.S. Patent No. 5,867,230 to Feng Chi Wang et al. (filed June 30, 1997, issued Feb. 2, 1999) (“Wang et al.”)
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1032	Shanwei Cen et al., <i>Flow and Congestion Control for Internet Media Streaming Applications</i> , Proc. SPIE 3310, Multimedia Computing and Networking 1998, 250 (Dec. 29, 1997) (“Cen et al.”)
1033	Jian Lu, <i>Signal Processing for Internet Video Streaming: A Review</i> , Proc. SPIE Image and Video Communications and Processing (Jan. 2000) (“Lu”)
1034	H. Schulzrinne et al., Real Time Streaming Protocol (RTSP), Internet Engineering Task Force, Internet Society (April 1998)
1035	U.S. Patent No. 7,529,806 to Yevgeniy Eugene Shteyn (filed Nov. 4, 1999, issued May 5, 2009) (“Shteyn”)
1036	U.S. Patent No. 5,721,878 to Hal Hjalmar Ottesen et al. (filed June 7, 1995, issued Feb. 24, 1998) (“Ottesen et al.”)
1037	<i>DV Format, Digital Video</i> , Canon U.S.A., Inc. (Oct. 13, 1999) https://web.archive.org/web/19991013131445/http://canondv.com:80/shared/dvinfo/dvinfo2.html
1038	Alan T. Wetzel, Michael R. Schell, <i>Consumer Applications of the IEEE 1394 Serial Bus, and a 1394/DV Video Editing System</i> , IEEE (1996) (“Wetzel et al.”)
1039	Won-Kyu Paik and Sun-Young Hwang, <i>Design of a novel synthesis filter for real-time MPEG-2 audio decoder implementation on a DSP chip</i> , 45 IEEE Transactions on Consumer Electronics 1119 (1999) (“Paik”)
1040	Keun-Sup Lee et al., <i>Software Optimization of the MPEG-Audio Decoder Using a 32-Bit MCU RISC Processor</i> , 48 IEEE Transactions on Consumer Electronics 671 (Aug. 2002) (“Lee”)

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1042	Patrick De Smet et al., <i>Do Not Zero-Pute: An Efficient Homespun MPEG-Audio Layer II Decoding and Optimization Strategy</i> , Proc. of ACM Multimedia 2004 conference, pp. 376-379 (2004) (“De Smet”)
1043	Patrick De Smet and Ignace Bruyland, <i>Optimized Recursive Subband Synthesis Windowing for Implementing Efficient MPEG Audio Decoders</i> , 10 IEEE Signal Processing Letters 303 (Oct. 2003) (“De Smet & Bruyland”)
1044	MPEG-4 Overview – (V.21 – Jeju Version), International Organisation for Standardisation Organisation International De Normalisation ISO/IEC JTC1/SC29/WG11 Coding of Moving Pictures and Audio (Mar. 2002)
1045	U.S. Patent No. 5,754,241 to Shigeyuki Okada et al. (filed Nov. 14, 1995, issued May 19, 1998) (“Okada”)
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1048	U.S. Patent No. 6,963,972 to Yuan-Chi Chang et al. (filed Sept. 26, 2000, issued Nov. 8, 2005) (“Chang”)
1049	U.S. Patent No. 6,490,320 to Anthony Vetro et al. (filed Apr. 11, 2000, issued Dec. 3, 2002) (“Vetro”)

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1051	U.S. Patent No. 7,398,312 to Katherine H. Guo et al. (filed Mar. 29, 2000, issued July 8, 2008) (“Guo”)
1052	U.S. Patent No. 8,868,772 to R. Drew Major and Mark B. Hurst (filed Apr. 28, 2005, issued Oct. 21, 2014) (“Major”)
1053	U.S. Patent Provisional Application No. 60/566,831 to Robert D. Major and Mark B. Hurst (filed Apr. 30, 2004)
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1057	List of Claims of U.S. Patent No. 10,771,849
1058	U.S. Patent No. 7,535,485 to Moshe Elbaz et al. (filed Aug. 14, 2001, issued May 19, 2009) (“Elbaz”)
1059	U.S. Patent No. 7,502,514 to Yaakov Gringeler et al. (filed Jan. 4, 2005, issued Mar. 10, 2009) (“Gringeler”)
1060	U.S. Patent No. 6,766,373 to Bruce A. Beadle et al. (filed May 31, 2000, issued July 20, 2004) (“Beadle”)
1061	U.S. Patent No. 7,099,389 to Guoyao Yu et al. (filed Dec. 10, 2002, issued Aug. 29, 2006) (“Yu”)

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1062	U.S. Patent No. 7,751,628 to Richard Reisman (filed Dec. 23, 2002, issued July 6, 2010) (“Reisman”)
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1070	Joint Claim Construction and Prehearing Statement filed in <i>Withrow Networks, Inc. v. Google, LLC</i> , No. 5:24-CV-3203 (N.D. Cal. June 23, 2025), ECF No. 92
1071	<i>Ex parte Krebs</i> , Decision on Appeal, Appeal No. 2016-002538, Application No. 11/107,952 (P.T.A.B. Nov. 15, 2016)
1072	Notice of Abandonment for Application No. 11/106,952 (Jan. 26, 2017)
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1076	Notice of Sotera Stipulation of Defendants Google LLC and YouTube, LLC filed in <i>Withrow Networks, Inc. v. Google, LLC</i> , No. 5:24-CV-3203 (N.D. Cal. Jul. 16, 2025), ECF No. 93
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1081	Declaration of Matthew Goldman, Reexamination No. 90/019,622 (U.S. Patent No. 6,389,473), May 27, 2025.
1082	Declaration of Matthew Goldman, Reexamination No. 90/019,622, Ex. E, “Implementing Adaptive HTTP Streaming Using the Web,” Toast UI, Medium, May 31, 2019, available at https://toastui.medium.com/implementing-adaptive-http-streaming-using-the-web-e2c12d46a38f
1083	Plaintiff Withrow Networks, Inc.’s Opposition to Defendants’ Motion to Dismiss Complaint filed in <i>Withrow Networks, Inc. v. Google, LLC</i> , No. 5:24-CV-3203 (N.D. Cal. August 23, 2024), ECF No. 36

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1084	Plaintiff Withrow Networks, Inc.'s Slide Presentation Regarding Defendants Motion to Dismiss presented in <i>Withrow Networks, Inc. v. Google, LLC</i> , No. 5:24-CV-3203 (N.D. Cal. October 1, 2024)
1085	Deposition Transcript for the Deposition of Matthew Goldman, <i>Google LLC v. Withrow Networks, Inc.</i> , IPR2025-00775 (PTAB)

I. INTRODUCTION

The Petition details why the challenged claims of the '849 patent are unpatentable in view of the asserted references, including Carmel [EX1003], Mattavelli [EX1004], and Wang [EX1007].

In its Response (“POR”), each of Patent Owner’s (“PO’s”) challenges rest on misunderstandings or misrepresentations of (1) what the asserted references teach, (2) what the Petition argues, and (3) incorrect, unsupported interpretations of the meaning and scope of certain claim terms, including the “adjusting said selection and playback,” “maintain quality playback,” and maintaining “fluidity” limitations.

The deficiencies in PO’s arguments are perhaps most apparent in the inconsistencies between the positions PO and its expert, Mr. Goldman, have taken in this IPR as compared to other proceedings. Mr. Goldman, in particular, has offered testimony about the meaning and scope of the challenged claims (EX1080) and on the teachings of Carmel (EX1081) that is irreconcilable with the testimony he offers in these proceedings.

In short, none of PO’s challenges to the Petition has merit, and each should be rejected by the Board.

II. THE ASSERTED GROUNDS ESTABLISH THE UNPATENTABILITY OF THE CHALLENGED CLAIMS

A. Ground 1: Carmel and Mattavelli render obvious the challenged claims

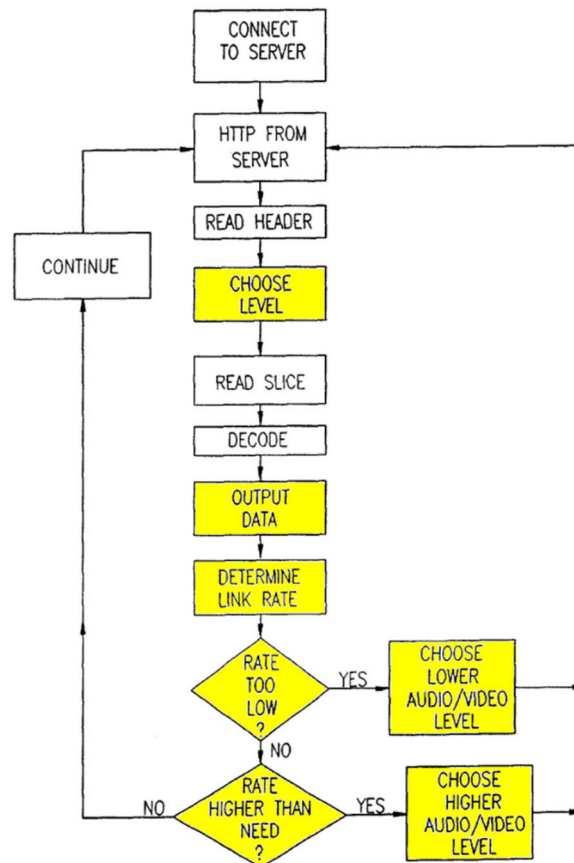
1. Carmel alone, and Carmel in combination with Mattavelli, teaches and renders obvious “autonomously adjusting said selection and playback”

The Petition explains in detail how Carmel alone, and Carmel in combination with Mattavelli, satisfies the “autonomously adjusting said selection and playback” limitations. (Pet., 35-50.) PO raises multiple arguments in response, primarily based on interpretations of this limitation and the Carmel reference that are not only unsupported but are contradicted by positions PO and its expert have taken outside of this IPR. For at least these reasons, PO’s arguments fail. But even if PO’s faulty interpretation of this limitation is adopted, the prior art still satisfies the claims.

a. Carmel alone satisfies the plain language of the claims, and PO’s unsupported and inconsistent claim interpretation arguments are unavailing

In accordance with the plain language of the claims, the Petition explains how Carmel’s disclosure of selecting slices corresponding to different data rates, and then playing back the slices at that data rate, satisfies the “autonomously adjusting said selection and playback” limitation. (Pet., 35-44, 50-55 (citing, *e.g.*, Carmel, 3:66-4:2, 10:64-11:22, 7:28-49, 8:42-9:9, 9:49-52, 10:27-31, 10:48-63, Figs. 3D, 6B).)

FIG. 6B



(Pet. 44; Carmel, Fig. 6B.)

PO does not dispute that Carmel teaches autonomously adjusting the selection of multimedia objects with different data rates, that are then played back at that data rate, wherein the data rate is adjusted according to multimedia object parameters and

supplied host path identification.¹ Instead, PO attempts to rewrite the “autonomously adjusting said selection and playback” limitation to require separately “adjusting playback,” and then argues the prior art fails to meet its rewrite of the claims. PO’s argument fails for multiple reasons.

First, PO’s argument fails because nothing in the claims requires separately “adjusting playback” as PO’s argument suggests. Instead, the plain language of the “autonomously adjusting” limitations recites that both “selection and playback” are adjusted together. PO provides no argument or evidence to the contrary.

Second, PO’s argument fails because it is inconsistent with PO’s interpretation of the claims in the related litigation. In this IPR, PO argues Carmel’s disclosure of selecting and playing back slices of different quality levels (data rates) is insufficient because it does not disclose “adjusting playback.” But in the related litigation, PO takes the opposite position. There, PO alleges that “adjusting [both] selection and playback” is satisfied by a system that, like Carmel, adjusts the quality level of a video stream based on bandwidth, without more. (EX1055, 053-054, 091-093 (arguing accused systems meet limitation because they allegedly “measure[] the

¹ PO’s expert agrees that in Carmel the client devices adjust the quality level (data rate) selection and play back the data stream according to the selected quality level (data rate). (EX1085, 28:7-29:7.)

bandwidth on the client and adaptively chooses chunks of video that can be downloaded fast enough” based on object parameters like bandwidth).)

playing back received multimedia objects by the multimedia player, wherein the multimedia player is configured to play multimedia objects in a sequence such that fluidity, video quality and audio quality are maintained by selecting a plurality of said multimedia objects that reflect available network bandwidth, autonomously adjusting said selection and playback according to the multimedia object parameters and supplied host path identification, and by	The YT Player selects a playlist variant based on bandwidth: Using playback statistics, we are able to model the behavior of the player as it switches between resolutions. This allows us in effect to predict when an increased bitrate would be more likely to cause a player to switch to a lower resolution and thereby cancel the effect of bitrate increase in any one resolution. With this model, we are able to find better operating points for each video in the real world.¹ Ex. 18. <i>Making high quality video efficient.</i> YouTube engineering documentation explicitly states that the YouTube player (on the client) autonomously (i.e., without server-side intervention) adjusts the video playback.  Engineering and Developers Blog What's happening with engineering and developers at YouTube Making high quality video efficient Tuesday, April 24, 2018 YouTube works hard to provide the best looking video at the lowest bandwidth. One way we're doing that is by optimizing videos with bandwidth in mind. We recently made videos stream better - giving you higher quality videos by improving our videos so they are more likely to fit into your available bandwidth. When you watch a video the YouTube player measures the bandwidth on the client and adaptively chooses chunks of video that can be downloaded fast enough, up to the limits of the device's viewport, decoding, and processing capability. YouTube makes multiple versions of each video at different resolutions, with bigger resolutions having higher encoding bitrates.
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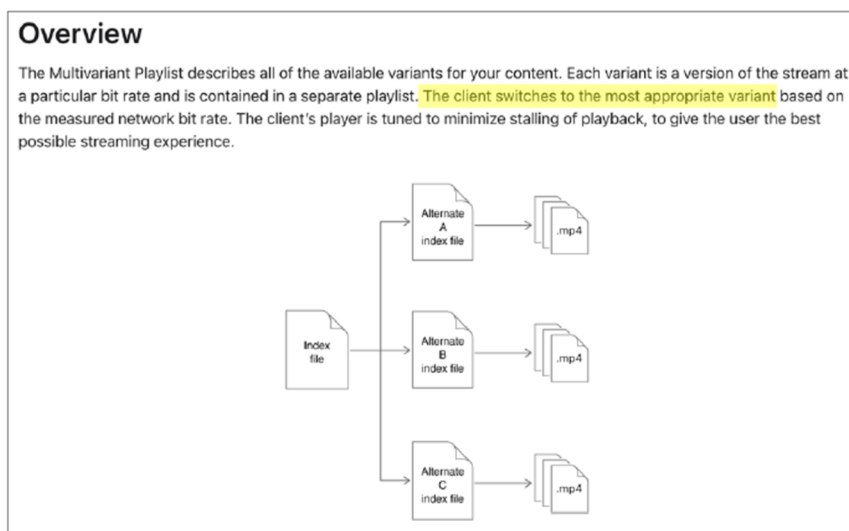
(*Id.*, 053 (red annotations added); *see also* EX1083, 0014 (arguing this portion of the claim “introduces the concept of ABR [adaptive bitrate streaming]” and describing the limitation as encompassing quality level adjustments based on data rate).) This functionality is exactly what Carmel teaches. (Pet., 35-44.)

Further illustrating its contradictory positions, PO alleges in the litigation that infringing systems include: “[1] encoded data with object parameters, [2] multimedia objects with location identifiers, and [3] fluid decoding and playback of media based on bandwidth conditions.” (EX1055, 018, 020.) PO does not dispute Carmel satisfies the first two of these listed elements. And, it cannot dispute—at

least consistent with its litigation arguments—that Carmel (alone and in the proposed combinations) satisfies this third listed element.

Indeed, PO alleges that this claim element is satisfied by any system implementing the HTTP Live Streaming (HLS) and the MPEG – Dynamic adaptive stream over HTTP (MPEG-DASH) standards. (EX1055, 017-021.) PO alleges, for example, that the “autonomously adjusting” claim element is purportedly satisfied because “[t]he HLS standard further requires autonomous selection of multivariant streams[.]” (*Id.*, 056.)

The HLS standard further requires autonomous selection of multivariant streams:



Ex. 13, HTTP Live Streaming Overview, Creating a multivariant playlist (last visited, Mar. 31, 2023).

(*Id.*, 056 (red annotation added).)

Notably, in his Carmel reexam declaration, Mr. Goldman states that Carmel’s teaching that “during real-time streaming, client computers may select a file from

different quality levels corresponding to that slice of multimedia data depending on the existing network conditions” was a feature “totally unavailable in the then-current state of the art” that “***was adopted several years later as standard in the industry.***” (EX1081, ¶¶37-38² (citing Carmel, 3:5-14), 34; EX1085, 45:4-13.) And, the evidence he cites in support of this assertion (EX1082, *Implementing Adaptive HTTP Streaming Using the Web*) notes that “[t]he two iconic technologies used to provide Adaptive HTTP Streaming are” HLS and MPEG-DASH. (EX1082, 005; EX1085, 46:21-47:10.) And while in the related litigation PO has attempted to credit HTTP ABR technology to the ’849 patent, PO’s expert has acknowledged that Carmel taught the same technology years earlier. (*Compare* EX1084, 0005-0010, 0021 (suggesting that the ’849 patent was the first to teach the client-driven, file-based, HTTP-based, variable-bit-stream approach underlying HTTP ABR), *with* EX1081, ¶¶26-42 (crediting the same technology underlying HTTP ABR to Carmel).)

In other words, PO’s expert previously identified Carmel as teaching the technology underlying HTTP ABR, later adopted by the HLS and MPEG-DASH streaming standards, the use of which PO now alleges necessarily satisfies the

² Unless indicated otherwise, all bold or bold with italics emphases in quotes have been added.

“autonomously adjusting” claim element. (EX1055, 017-021; EX1081, ¶¶37-38; EX1082, 001-003 (describing the multi-level streaming idea underlying adaptive streaming), 004-005.) Accordingly, neither PO nor Mr. Goldman can credibly claim that Carmel fails to teach and render obvious the “autonomously adjusting” claim element 1[c.iii].

Third, PO’s argument fails because PO and its expert misunderstand (or misrepresent) Carmel’s teachings and the Petition’s arguments concerning this “autonomously adjusting” claim element. PO attempts to distinguish between (a) the multimedia data quality level and transmission rate, and (b) the multimedia playback data rate. (POR, 32-33.) The Petition explains, however, how Carmel teaches that all of these things—(i) the encoding data rate/quality level, (ii) the transmission/download rate, and (iii) the playback rate—should generally match and teaches techniques (including the multi-level streaming embodiment) for achieving this balance in its improved real-time streaming system. (*See* Pet., 33-44, 50-52 (citing, *e.g.*, Carmel, Abstract, 3:66-4:2, 7:35-41, 8:42-9:9, 10:48-11:22, Figs. 3D, 6B).) Carmel teaches adjustment of the “playback” of the multimedia stream based on the quality level (a multimedia object parameter) of the selected multimedia slices/segments/objects (according to their host path identifiers) in a manner reflecting the potentially varying available network bandwidth, via the use of time

stamps (multimedia object parameters). (*See id.*)

Indeed, in the declaration he submitted in the Carmel reexam, **PO's** expert, Mr. Goldman, acknowledged these teachings of Carmel. (*See* EX1081, ¶¶26, 37-40, 41 (“[Carmel] provides explicit steps for **rate control**, balancing the given data rate provided at the transmitting computer, the upload rate, download rate, and replay rate, including techniques for adjusting these rates synergistically[.]” (underlining added)), 65.) Mr. Goldman’s acknowledgment that Carmel teaches “adjusting” the download (selection) and replay rate (playback) confirms Petitioner’s argument that Carmel “adjusts [both] selection and playback.” (*Id.*; *see also* EX1085, 30:8-16.) Mr. Goldman further acknowledged that these rate-control techniques addressed “the issues of (a) varying bandwidth conditions ..., and (b) providing the best video quality [i.e., *playback*] at a fraction of the cost required by technologies known at the time.” (EX1081, ¶42; *see also* EX1085, 15:9-11 (recognizing video quality is one of the aspects of playback).) Mr. Goldman’s opinions offered by PO in this IPR on what Carmel teaches cannot be reconciled with the opinions he offered about Carmel in Carmel’s reexam. (*Compare* EX2014, ¶¶98-99, *with* EX1081, ¶¶26, 37-39, 41-42, 64-65.) His opinions in this IPR should be disregarded.

PO also improperly isolates certain teachings from Carmel in order to mischaracterize them. For example, PO asserts that Carmel’s disclosure concerning

the use of time stamps to ensure the data transmission is “keeping up” or to “synchronize the data, so that multimedia sequence is played back just as it was input at computer 34” relates only to data transmission or proper data sequencing, not adjusting playback. (POR, 33.) PO misrepresents these selectively quoted teachings.

For example, Carmel provides more fully:

In the case of a multimedia stream, *client 30 reconstructs and outputs the multimedia data for the appreciation of a user*. Time stamps in the data stream *are used to synchronize the data, so that the multimedia sequence is played back just as it was input at computer 34*, preferably with only a minimal necessary transmission and decoding delay.

(Carmel, 10:48-54; *see also* Pet., 23, 34, 36-37, 43, 50-51.) The disclosure of “play[ing] back” the multimedia sequence “just as it was input at computer 34” is referring to playing the multimedia “for the appreciation of a user”—i.e., playing back the video and audio like the subject-matter was captured by the recording devices 22 and input at computer 34. (*See* Carmel, Fig. 2.) “In other words,” as **PO**’s expert Mr. Goldman put it in his reexam declaration, Carmel “seeks to make the client’s experience of watching a video being broadcast in accordance with the method disclosed therein to be as close as possible to matching a ‘live’ or in-person experience.” (EX1081, ¶46.) Carmel’s teachings are all ultimately connected to improved media playback “for the appreciation of a user.”

PO also contends that Carmel only uses object parameters (such as time

stamps) for playback ordering and not adjusting playback. (POR, 33.) PO's assertions are belied by teachings PO completely ignores. The Petition, for example, quotes Carmel at 10:64-11:22, which teaches that the client player makes an assessment of the available bandwidth, and if the transfer rate is low, "*such that time stamps 59 indicate that the slices need to be played as fast as or faster than they are being received*, the client will preferably select a lower quality level" and vice versa. (Pet., 41-43.) Carmel thus explicitly teaches that time stamps (object parameters) are used to adjust playback by selecting lower quality segments (using their host path identification) that can be received at a rate that matches the playback rate. (*Id.*) Switching from a higher quality stream of multimedia objects to a lower quality stream—or vice versa—is *adjusting playback*.

b. Carmel in view of Mattavelli teaches this limitation under even PO's narrow interpretation

The Petition also explains how Mattavelli teaches adjusting the playback of multimedia segments according to multimedia object parameters. (Pet., 44-51.) Namely, the Petition describes how Mattavelli teaches a decoder/multimedia player that uses decoding prediction complexity metadata (which PO does not dispute is a "multimedia object parameter") that is available with the MPEG-4 standard to determine when and by how much to apply its computationally graceful degradation (CGD) techniques to adjust the decoding and playback of received video segments.

(Pet., 44-45 (citing, *e.g.*, Mattavelli, 2309, 2311-12).)

PO and its expert argue that Mattavelli does not use the word “playback.” (POR, 34.) But the prior art need not use identical words as those recited in the claims. *See Structural Rubber Prods. Co. v. Park Rubber Co.*, 749 F.2d 707, 716 (Fed. Cir. 1984). And it cannot be reasonably disputed that the CGD techniques taught by Mattavelli are (temporary) client-side adjustments to the playback of the received multimedia data. (Pet., 44-49; Mattavelli, 2309, 2311-12.) Indeed, temporary degradations to video quality is one of the ways the ’849 patent discloses adjusting playback. (*E.g.*, EX1001, 4:7-23, 13:6-14:60.)

The combination of Carmel (which teaches “autonomously adjusting [] selection”) and Mattavelli (which teaches separately “autonomously adjusting [] playback”) therefore satisfies this limitation even under PO’s narrow interpretation.

2. Carmel teaches maintaining fluidity

PO’s argument that Carmel does not teach maintaining fluidity rests on a mass of false premises and incorrect assertions. (POR, 34-42.) It should be rejected accordingly.

First, PO is incorrect when it states “[t]he Petition alleges Carmel alone

satisfies this [maintaining fluidity] limitation.” (POR, 34, 42-43.)³ To the contrary, the Petition details how the ***combination*** of Carmel’s and Mattavelli’s teachings work together in a complementary way to mitigate separate but related issues that can impact playback fluidity (and quality), including (1) variations in available network bandwidth and (2) processing and memory limitations in the decoder device (constraints which PO also identifies as impacting fluidity; *see* POR, 35-36), to thereby maintain playback fluidity. (Pet., 50-55, 35-50.)

Second, PO is wrong when it asserts that the teachings from Carmel identified in the Petition “generally discuss sequencing [of] data slices” and are limited to simply playing segments in the correct sequence or order. (POR, 35-36.) While *some of* Carmel’s teachings relate to playing the sequence of slices in the correct order, Carmel’s teachings go well beyond this specific concept. Indeed, as discussed above, Carmel’s teachings as a whole, including its multi-level streaming teachings, are directed towards the goal of playing the multimedia “for the appreciation of a user”—which includes fluid playback without abrupt, perceptually annoying

³ PO asserts that the 1[c.-numbered] claim elements should be considered together but then ignores how the Petition does so (*e.g.*, Pet., 39 n.7, 44-45, 50-52) and misleadingly critiques the Petition’s discussion of each sub-element in separate sections.

interruptions. (Pet., 50-51, 35-44.) In the district court litigation, PO explicitly recognized that “[m]edia fluidity and quality are maintained” using the same multi-level streaming technique. (EX1083, 0014.) And, as Mr. Goldman put it in his reexam declaration, “[Carmel] seeks to make the client’s experience of watching a video being broadcast in accordance with the method disclosed therein to be as close as possible to matching a ‘live’ or in-person experience”—which indisputably encompasses providing and maintaining playback “fluidity.” (EX1081, ¶46; EX1085, 22:1-4.)

Third, PO again draws a false distinction/separation between multimedia transmission and playback to incorrectly assert that Carmel’s teachings relating to transmission/reception/download rates have no bearing whatsoever on playback fluidity. (POR, 37.) As discussed in the previous section, the Petition explains how Carmel expressly connects these ideas and how, outside of this IPR, Mr. Goldman also previously recognized this connection between the transmission rate and a fluid replay rate in Carmel’s teachings. (*E.g.*, Pet., 41-43; Carmel, 10:64-11:22, Fig. 6B; EX1081, ¶¶41-42, 46.)

Fourth, PO asserts incorrectly that the Petition relies on the background knowledge of a POSA to satisfy the “maintaining fluidity” limitation, purportedly because Carmel does not. (POR, 39-42.) This is not so. The observation that high-

quality fluid playback is the goal of any real-time streaming system—which PO explicitly admits is true (POR, 39)—was included in the Petition not to fill in any gaps in Carmel but to further show how Carmel’s teachings (including its multi-level streaming techniques) are consistent with and in service of this undisputed goal. This goal and knowledge of a POSA is additional evidence that a POSA would ***not*** have understood Carmel’s teachings in the narrow, limited, and incorrect manner that PO and Mr. Goldman (in this IPR) advocate.

Fifth, PO asserts that “[r]eal-time broadcasting is not a proxy for fluidity and quality.” (POR, 39.) This is inconsistent with how the ’849 patent and Mr. Goldman have used the term “real-time” to signify or characterize a streaming system that operates fast enough to provide fluid, quality playback. (EX1001, 1:13-17, 3:63-67, 12:12-18, 12:60-13:14; EX1081, ¶¶25-27, 37-38, 41-42, 46; EX1080, 65:10-14 (“[G]iven what these tools are doing, which are trading off quality ***for realtime processing or being able to deliver a fluid picture***, due to constraints and limitations in the client and the network.”).)

Sixth, PO seemingly suggests that the Asserted Claims are limited to mobile devices. (POR, 39-40.) Any such argument is mistaken. The Asserted Claims recite receipt of multimedia objects “using a wireless connection” but do not recite any particular type of wireless connection or client device. (EX1001, cl.1; EX1085, 5:19-

6:2 (recognizing a laptop can use a wireless connection).)

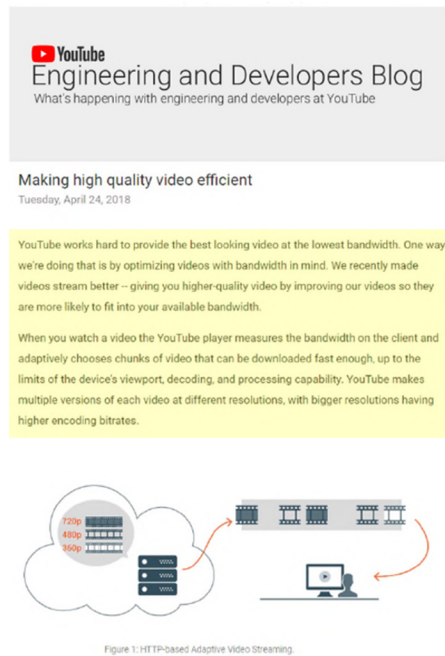
Seventh, PO quotes the '849 patent's disclosure that the "playback of multimedia objects in a *synchronized fashion is critical to fluid playback*," (POR, 34; EX1001, 3:43-45⁴), but PO inexplicably dismisses Carmel's nearly identical teachings that "[t]ime stamps in the data stream are *used to synchronize the data, so that the multimedia sequence is played back* just as it was input at computer 34" as somehow purportedly failing to teach or suggest fluid playback. (Pet., 36-37, 42-43, Carmel, 10:48-54, 2:15-21.)

Finally, PO's assertion that Carmel fails to satisfy the maintaining fluidity limitation is also inconsistent with its position in the related litigation, where it alleges that the mere provision of "multiple versions of each stream that fit available bandwidth" satisfies this limitation. (See Pet., 39; EX1055, 050-052, 087-090, 017-021.)

⁴ This is the only disclosure in the '849 specification that uses the term "fluid" or "fluidity."

playing back received multimedia objects by the multimedia player, wherein the multimedia player is configured to play multimedia objects in a sequence such that fluidity, video quality and audio quality are maintained by selecting a plurality of said multimedia objects that reflect available network bandwidth, autonomously adjusting said selection and playback according to the multimedia object parameters and supplied host path identification, and by

YouTube playback fluidity, video quality, and audio quality are maintained based on multiple versions of each stream that fit available bandwidth:



Ex. 18, *Making high quality video efficient*, YouTube Engineering and Developers Blog, <https://youtube-eng.googleblog.com/2018/04/making-high-quality-video-efficient.html> (Apr. 24, 2018), at 1.

(EX1055, 050 (red annotation added).)

playing back received multimedia objects by the multimedia player, wherein the multimedia player is configured to play multimedia objects in a sequence such that fluidity, video quality and audio quality are maintained by selecting a plurality of said multimedia objects that reflect available network bandwidth, autonomously adjusting said selection and playback according to the multimedia object parameters and supplied host path identification, and by

YouTube playback fluidity, video quality, and audio quality are maintained based on multiple versions (green) of each video that reflect available bandwidth (yellow):

```
#EXT-X-INDEX-SEGMENTS
#EXT-X-MEDIA:INTEGRAL=https://manifest.googlevideo.com/api/manifest/hls_playlist/expire/17185204/eq/3HC2U09KKKL_9EP2KH2AaQ/v/173.72.104.227/1d/6e6d646819963f31/itag/608/source/you/youtube-redirect/playlist/17185204/eq/3HC2U09KKKL_9EP2KH2AaQ/v/173.72.104.227/1d/6e6d646819963f31/itag/608/source/you
#EXT-X-STREAM-INF: BANDWIDTH=17520, CODECS=avc1.404015, mp4.40.5, RESOLUTION=426x240, FRAME-RATE=24, VIDEO-RANGE=SDR, AUDIO="23", CLOSED-CAPTIONS=NONE
https://manifest.googlevideo.com/api/manifest/hls_playlist/expire/17185204/eq/3HC2U09KKKL_9EP2KH2AaQ/v/173.72.104.227/1d/6e6d646819963f31/itag/229/source/you/youtube-redirect/playlist/17185204/eq/3HC2U09KKKL_9EP2KH2AaQ/v/173.72.104.227/1d/6e6d646819963f31/itag/229/source/you
https://manifest.googlevideo.com/api/manifest/hls_playlist/expire/17185204/eq/3HC2U09KKKL_9EP2KH2AaQ/v/173.72.104.227/1d/6e6d646819963f31/itag/229/source/you/youtube-redirect/playlist/17185204/eq/3HC2U09KKKL_9EP2KH2AaQ/v/173.72.104.227/1d/6e6d646819963f31/itag/229/source/you
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https://manifest.googlevideo.com/api/manifest/hls_playlist/expire/17185204/eq/3HC2U09KKKL_9EP2KH2AaQ/v/173.72.104.227/1d/6e6d646819963f31/itag/230/source/you/youtube-redirect/playlist/17185204/eq/3HC2U09KKKL_9EP2KH2AaQ/v/173.72.104.227/1d/6e6d646819963f31/itag/230/source/you
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https://manifest.googlevideo.com/api/manifest/hls_playlist/expire/17185204/eq/3HC2U09KKKL_9EP2KH2AaQ/v/173.72.104.227/1d/6e6d646819963f31/itag/231/source/you/youtube-redirect/playlist/17185204/eq/3HC2U09KKKL_9EP2KH2AaQ/v/173.72.104.227/1d/6e6d646819963f31/itag/231/source/you
#EXT-X-STREAM-INF: BANDWIDTH=159930, CODECS=avc1.40400C, mp4.40.5, RESOLUTION=2560x1440, FRAME-RATE=24, VIDEO-RANGE=SDR, AUDIO="233", CLOSED-CAPTIONS=NONE
https://manifest.googlevideo.com/api/manifest/hls_playlist/expire/17185204/eq/3HC2U09KKKL_9EP2KH2AaQ/v/173.72.104.227/1d/6e6d646819963f31/itag/269/source/you/youtube-redirect/playlist/17185204/eq/3HC2U09KKKL_9EP2KH2AaQ/v/173.72.104.227/1d/6e6d646819963f31/itag/269/source/you
https://manifest.googlevideo.com/api/manifest/hls_playlist/expire/17185204/eq/3HC2U09KKKL_9EP2KH2AaQ/v/173.72.104.227/1d/6e6d646819963f31/itag/269/source/you/youtube-redirect/playlist/17185204/eq/3HC2U09KKKL_9EP2KH2AaQ/v/173.72.104.227/1d/6e6d646819963f31/itag/269/source/you
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https://manifest.googlevideo.com/api/manifest/hls_playlist/expire/17185204/eq/3HC2U09KKKL_9EP2KH2AaQ/v/173.72.104.227/1d/6e6d646819963f31/itag/608/source/you/youtube-redirect/playlist/17185204/eq/3HC2U09KKKL_9EP2KH2AaQ/v/173.72.104.227/1d/6e6d646819963f31/itag/608/source/you
https://manifest.googlevideo.com/api/manifest/hls_playlist/expire/17185204/eq/3HC2U09KKKL_9EP2KH2AaQ/v/173.72.104.227/1d/6e6d646819963f31/itag/608/source/you/youtube-redirect/playlist/17185204/eq/3HC2U09KKKL_9EP2KH2AaQ/v/173.72.104.227/1d/6e6d646819963f31/itag/608/source/you
#EXT-X-STREAM-INF: BANDWIDTH=58720, CODECS=vp09.00.20.08, mp4.40.2, RESOLUTION=640x360, FRAME-RATE=24, VIDEO-RANGE=SDR, AUDIO="234", CLOSED-CAPTIONS=NONE
https://manifest.googlevideo.com/api/manifest/hls_playlist/expire/17185204/eq/3HC2U09KKKL_9EP2KH2AaQ/v/173.72.104.227/1d/6e6d646819963f31/itag/608/source/you/youtube-redirect/playlist/17185204/eq/3HC2U09KKKL_9EP2KH2AaQ/v/173.72.104.227/1d/6e6d646819963f31/itag/608/source/you
https://manifest.googlevideo.com/api/manifest/hls_playlist/expire/17185204/eq/3HC2U09KKKL_9EP2KH2AaQ/v/173.72.104.227/1d/6e6d646819963f31/itag/608/source/you/youtube-redirect/playlist/17185204/eq/3HC2U09KKKL_9EP2KH2AaQ/v/173.72.104.227/1d/6e6d646819963f31/itag/608/source/you
#EXT-X-STREAM-INF: BANDWIDTH=17020, CODECS=vp09.00.20.08, mp4.40.2, RESOLUTION=480x360, FRAME-RATE=24, VIDEO-RANGE=SDR, AUDIO="234", CLOSED-CAPTIONS=NONE
https://manifest.googlevideo.com/api/manifest/hls_playlist/expire/17185204/eq/3HC2U09KKKL_9EP2KH2AaQ/v/173.72.104.227/1d/6e6d646819963f31/itag/608/source/you/youtube-redirect/playlist/17185204/eq/3HC2U09KKKL_9EP2KH2AaQ/v/173.72.104.227/1d/6e6d646819963f31/itag/608/source/you
```

Video.

(*Id.*, 051 (red annotation added).)

Again, PO alleges in its Complaint that players that utilize the HLS and MPEG-DASH standards necessarily require “display[ing]” “media files” in a way that’s “fluid” as part of “decoding and sequential playback”, and Mr. Goldman testified that the multi-level streaming feature of these standards that PO alleges as infringing was taught years earlier by Carmel. (EX1055, 017-021; EX1081, ¶¶37-38.)

1 | *The HLS Standard*

2 | 61. The provision of mobile players and systems utilizing the HLS standard to deliver
3 | multimedia violates Withrow’s rights under the ’849 Patent.

4 | 62. Apple Inc., the developer of HLS, describes that standard as follows:

5 | HTTP Live Streaming provides a reliable, cost-effective means of
6 | delivering continuous and long-form video over the Internet. It allows a
7 | receiver to adapt the bit rate of the media to the current network conditions
8 | in order to maintain uninterrupted playback at the best possible quality.

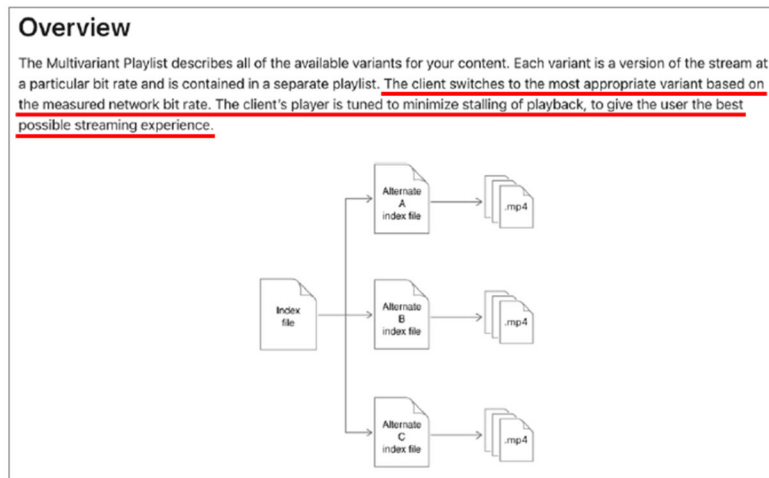
8 | Ex. 12, Roger Pantos & William May, Jr., *HTTP Live Streaming*, RFC 8216, at 4,

9 | <https://datatracker.ietf.org/doc/rfc8216/>.

20 65. Implementations of the HLS streaming protocol in systems, software, and methods
 21 infringe the '849 Patent.

22 66. For example, HLS processes include: *encoding* data (“a hardware encoder takes
 23 audio-video input, encodes it . . . and breaks the stream into a series of short files” (Ex. 13 at 2
 24 (*HTTP Live Streaming – Overview*)) with *object parameters* (“#EXT-X-STREAM-INF:
 25 BANDWIDTH=640000, RESOLUTION=640x360, CODECS=“avc1.42e00a,mp4a.40.2” (Ex.
 26 13 at 10 (*HTTP Live Streaming – Creating a Multivariant Playlist*)), *host path identifiers*
 27 (“http://example.com/movie1/fileSequenceA.ts” (Ex. 13 at 6 (*HTTP Live Streaming – Video on*
 28 *Demand playlist construction*)), and *decoding and sequential playback* (“The URL of the index file
 1 is published on the web server . . . then requests the listed media files in order and displays them
 2 without any pauses or gaps between segments” (Ex. 13 at 2 (*HTTP Live Streaming – Overview*))
 3 such that it is *fluid* (“minimize stalling of playback, to give the user the best possible streaming
 4 experience” (Ex. 13 at 9 (*HTTP Live Streaming – Creating a Multivariant Playlist*)).

For adaptive multi-bit-rate playback, HLS requires the player to assess network bandwidth availability to select multimedia objects:



Ex. 13, *HTTP Live Streaming – Creating a Multivariant Playlist*, at 9.

(EX1055, 017-019, 052 (red annotations added).)

3. Carmel and Mattavelli teach and render obvious the “fluidity, video quality and audio quality are maintained” and the “maintain quality playback” limitations

PO argues Mattavelli does not teach “maintaining” fluidity, audio or video quality or quality playback because it teaches methods that (potentially, temporarily) degrade video quality when necessary to maintain fluidity/real-time playback. (POR, 43-47.) PO is wrong.

PO’s argument rests on a *de facto* construction of “maintaining” fluidity, video, or audio quality or quality playback to mean there cannot ever be *any* change in *any* of these characteristics—regardless of for how long, for what reason (such as fluctuations in available network bandwidth or decoding resources), or for what purpose (such as preserving fluidity of the playback at the expense of other aspect(s) of playback quality). (*Id.* (“Degrading is not maintaining video quality.”).)

The Board should reject such a construction because it is contrary to the claim language and the intrinsic evidence. The claims themselves recite that “fluidity, video quality and audio quality are *maintained*” by first “selecting” multimedia objects in a manner that reflects available bandwidth and then “*adjusting said selection and playback.*” (EX1001, cl.1.) “*Maintaining,*” as recited in the challenged claims, thus must encompass some *adjustment* to playback characteristics/qualities; it cannot mean that all playback qualities must remain static and unchanging. Even PO’s expert agreed that “adjusting said selection” as recited

in the claims covers going from a high-quality stream to a low-quality stream if network bandwidth reduces. (EX1085, 42:20-44:4.)

The '849 specification further clarifies that “optimized decoding processes to *maintain quality playback*” encompass processes—like those disclosed by Mattavelli—where video quality is degraded when necessary to maintain or preserve other playback characteristics like fluidity or audio quality. The '849 specification provides, for example:

[T]he invention provides **novel optimizations for digital video decoding.... The *client player-decoder dynamically adjusts how many shortcuts must be taken. These short-cuts are specifically designed to drastically reduce the number of computations necessary at certain critical steps in the video decoding process at the cost video output quality.***

(EX1001, 4:7-23, 12:12-29 (process “uses faster motion compensation ... when less quality but faster processing is required.”), 12:60-13:14, 13:15-14:15 (“*the output video can be unrecognizable at times*” so low quality level “is used only in drastic cases *of a sudden drop in processor availability.*”), Figs. 8-9, 13.)

PO's *de facto* construction of “maintaining” that rejects any degradation in video/visual quality for any reason is also inconsistent with PO's and Mr. Goldman's positions in the related litigation. There, Mr. Goldman repeatedly testified that a process that used simplified processes that degraded video quality in order to

preserve another playback quality (e.g., fluidity) in the face of resource constraints still satisfied the “maintaining” claim limitations. (EX1080, 22:21-23:6, 24:6-11, 25:2-27:24, 29:21-30:2, 32:11-34:20, 36:7-38:22, 40:9-17, 53:3-7, 56:3-10, 65:4-66:14, 89:18-91:14, 102:1-103:16, 108:14-22, 114:21-117:22; EX1085, 11:21-12:15, 13:14-22.)

The Petition thus shows that Mattavelli’s CGD techniques are optimized decoding processes that satisfy the “maintaining” limitations, as properly interpreted. (Pet., 45-55.)

Further, even if one were to accept *arguendo* PO’s *de facto* construction of “maintaining” fluidity and quality, Mattavelli would still satisfy these claim limitations. This is so because Mattavelli teaches that its CGD techniques are not intended to be run all the time, but only when its algorithms determine it is necessary “to guarantee real-time performance in [the] presence of peaks of decoding complexity or as a way to ease the scheduling problems given by temporary fluctuations of the available processing power.” (Pet., 46 (alteration in original); Mattavelli, 2312.) When decoding a video stream and not running up against processor resource constraints, a player/decoder would not be applying Mattavelli’s CGD techniques and would be maintaining (even in the narrow, incorrect sense PO proposes) video quality during that time. (*Id.*) *Unwired Planet, LLC v. Google Inc.*,

841 F.3d 995, 1002 (Fed. Cir. 2016) (“combinations of prior art that sometimes meet the claim elements are sufficient to show obviousness.”). And, Mr. Goldman testified that such circumstances where a decoder is determining/deciding not to apply available decoding simplifications still constitutes use of an “optimized decoding process.” (EX1080, 67:8-13.)

Additionally, the Petition also describes Mattavelli’s teachings that its CGD techniques “enable more efficient usage of the hardware processing power” without needing “sustained over-sizing of processing resources,” thereby allowing, e.g., a given client to handle decoding more complex, more efficient compression methods, which provide more efficient network bandwidth usage and ultimately provide and *maintain* improved/higher quality playback *overall* than would otherwise have been obtainable. (Pet., 53-54; Mattavelli, 2309, 2312 (CGD techniques can enable use of standards/levels/profiles that would otherwise have been “forbidden”).)

Finally, PO argues that Mattavelli does not teach maintaining fluidity or playback quality by again arguing that “real-time” has no connection to or overlap with “fluidity.” (POR, 44-47.) PO once again is wrong.

Mattavelli directly connects “real-time” with fluidity and the avoidance of perceptually annoying, *un-fluid* “abrupt interruptions,” via its teaching that its complexity-reducing CGD techniques are preferable to other alternatives for

respecting real-time constraints, such as skipping frames, for a decoder that cannot keep up with a stream. (Pet., 45-51; Mattavelli, 2309-10.) And, as discussed above, both the '849 patent and Mr. Goldman (outside of this IPR) have connected and equated real-time playback with fluid, quality playback of a multimedia stream. (EX1001, 1:13-17, 3:63-67, 12:12-18, 12:60-13:14; EX1081, ¶¶25-27, 37-38, 41-42, 46; *see also* EX1080, 65:10-14 (“[G]iven what these tools are doing, which are trading off quality *for realtime processing* or *being able to deliver a fluid picture*, due to constraints and limitations in the client and the network.”), 47:4-9.)

B. Ground 2: Carmel and Wang render obvious the challenged claims

1. Wang teaches maintaining quality playback

The Petition explains that use of Wang’s optimized decoding processes would enable mobile devices to maintain quality playback by giving such computationally-constrained and memory-constrained devices the ability to receive AVC-encoded video data and decode it fast enough to provide and maintain playback of such AVC-encoded data, which Wang teaches “provides better image quality due to its significant improvement on the coding efficiency.” (Pet., 71-74, 76-78; Wang, 51, 52-55.)

PO’s argument that Wang only teaches improving throughput/decoding speed and not maintaining quality playback (POR, 49-51), falsely distinguishes these concepts in a manner that is inconsistent with the '849 specification, PO’s arguments

in the district court, and Mr. Goldman's prior testimony. Again, the '849 specification repeatedly describes the use of shortcuts/decoding optimizations that *decrease* decoding complexity and video quality in order to *increase* decoding speed. (EX1001, 4:7-23, 12:12-29 (process "uses faster motion compensation ... when less quality but faster processing is required."), 12:60-13:14, 13:15-14:15, Figs. 8-9, 13.) In the district court, PO pointed to these same teachings as examples of optimized decoding processes. (EX1083, 0014-0016.) And Mr. Goldman testified that these decoding optimizations are used to increase decoding speed in service of maintaining an overall playback quality. (EX1080, 18:10-13, 22:21-22:6 ("[I]f you didn't apply these [shortcuts] ... it would not be able to maintain fluidity and audio/video quality."), 25:2-27:24, 29:21-30:2 (decoding optimizations used "to maintain a smooth video stream, that otherwise could not be completed in time using unabridged computations"), 36:7-38:8, 40:9-17, 89:18-91:14.)

Likewise, Wang does not teach that its decoding optimizations are meant to be used to increase decoding speed/throughput for its own sake but rather to enable a mobile device to provide and *maintain* a better-quality playback using AVC-encoded data, which it would not otherwise have been able to do. (Pet., 75-77; Wang, 51; *see also* EX1080, 53:3-7.)

For these same reasons, PO's assertion that Wang does not satisfy the "such

that fluidity, video quality and audio quality are maintained” limitations is also mistaken. (POR, 51.) The Petition explains that Wang teaches optimized decoding processes that enable limited mobile devices to decode AVC-encoded data fast enough to enable the use of this more efficient compression standard and maintain these three playback characteristics. (Pet., 73, 71-72, 75-78; *compare* Wang, 51 (describing optimized decoding processes that improved throughput 6-7 times over a reference decoder and achieved decoding rates up to 6.6 to 10.3 frames per second on mobile processor), *with* EX1001, 18:64-19:3 (applied “decoder optimizations and strategies” “make it possible for the multimedia object player 10 to playback live music and video, at acceptable frame rates (5-15 fps), on limited, cell phone handsets”).)

Further, contrary to PO’s passing suggestion otherwise (POR, 51), Wang’s teachings regarding optimized *video* decoding processes is sufficient to satisfy the utilizing optimized decoding processes “to maintain quality playback” limitation and the “such that fluidity, video quality, and audio quality are maintained” limitations. (See, e.g., EX1001, cl. 9 (reciting “video decoding optimization” alone for maintaining “fluidity, video and audio quality”); EX1080, 25:2-27:19, 29:21-30:8, 33:23-34:20, 36:7-25, 89:18-91:14; EX1083, 0014-0016 (pointing to video decoding alone for this limitation).)

2. A POSA would have combined Carmel and Wang's teachings

PO's legally and logically flawed challenge to the motivations to combine Carmel and Wang should also be rejected. (POR, 52-55.)

PO asserts that “one of the primary purposes of Carmel” is to enable “seamless streaming to diverse client devices” but then confusingly suggests that such “diverse” client devices are limited to “conventional personal computers or workstations.” (POR, 53 (emphasis omitted) (citation omitted).) Carmel's teachings are not limited exclusively to such exemplary, preferred-embodiment client devices but are applicable to a wide variety of client devices—including mobile devices—operating on a wide variety of networks. (Pet., 29-32, 33-34; Carmel, 6:36-44; EX1081, ¶42.)

PO's assertion that “Carmel seeks to implement media streaming over *existing* client hardware and software”—which PO alleges Carmel does not control—is also mistaken. (POR, 53-54.) Carmel teaches a system that does not require a dedicated or customized broadcast *server*. Rather than using “existing client hardware and software” it discloses providing special software (e.g., a Java applet or plug-in) to enable a client device to “receive and play back the broadcast” according to Carmel's methods. (Pet., 26, 33-34; Carmel, 1:34-67, 6:44-60, 7:12-17, 10:27-35, 13:54-14:16; EX1081, ¶26.)

PO then relies on these false premises to make conclusions that do not logically follow. For example, PO asserts “[i]mplementing Wang’s decoder in Carmel would require upgrading each [and every] client’s personal computer or workstation to include improved decoder hardware and software.” (POR, 54.) Obviousness law doesn’t require that every client device be updated. Instead, only one or some client(s) using an ARM hardware platform⁵ in a broadcasting system implementing Carmel’s teachings would have been sufficient to motivate a POSA to combine Carmel and Wang’s teachings as proposed. (Pet., 75-78.)

PO in no way shows that combining Carmel and Wang’s teachings would render Carmel inoperable for its intended purpose. (POR, 53-54.) Instead, PO’s challenge to the motivation to combine these references is nothing more than a confused, mistaken, and improper bodily incorporation argument. *See In re Keller*, 642 F.2d 413, 425 (C.C.P.A. 1981).

C. Grounds 3-5: PO’s challenges to Grounds 3-5 are mistaken

As an initial matter, Grounds 3-5 address claim elements that PO does not dispute are satisfied by Carmel and Mattavelli and/or Carmel and Wang.

⁵ Wang teaches the ARM hardware platform was “one of the most typical portable devices and [took] almost 75% of the market for the mobile devices.” (Wang, 52; Pet., 72.)

Accordingly, the Board need not address Grounds 3-5 if it finds (as it should) that the first two Grounds render the challenged claims unpatentable.

PO's challenge to Ground 3 rests on misleading wordplay. PO asserts that because the HE-AAC LP variant has "reduce[d] audio quality" *compared to* the high-quality variant, the LP variant cannot be used in "maintaining" audio quality. (POR, 55-56.) For the reasons discussed above, PO misconstrues what the "maintaining" limitations require, and its argument is contradicted by Mr. Goldman's testimony that '849 patent discloses "maintain[ing] the best quality you can" given bandwidth and device capabilities rather than maintaining some "absolute quality" level. (EX1080, 27:20-24, 22:4-23:6, 56:3-10.)

PO's quibble with Grounds 4 & 5—that the Petition did not mention Mattavelli or Wang in its rationale to combine the additional references asserted in these Grounds (POR, 58-60)—should be rejected because it fails to appreciate that the teachings from Guo (multiple servers), Yu (transcoding), and Forecast (splitting at I-frame) concern only *server-side* preparation and broadcasting of a multimedia stream. (Pet., 80-86.) That is, these additional teachings only modify Carmel's server-side teachings, not the client-side teachings of Carmel, Mattavelli, or Wang, so the Petition appropriately explains why a POSA would have been motivated to combine these references as proposed. (*Id.*)

D. Petitioner’s claim construction positions before the Board and the district court are coherent and justified; PO’s are not

PO argues for the first time in its POR that Google has taken inconsistent claim construction positions and has not provided any justification for such alleged inconsistencies. (POR, 60-61.) PO’s argument should be rejected, both (i) because PO has forfeited this institution-related argument by failing to raise it in its Request for Discretionary Denial, Preliminary Patent Owner Response, or Request for Director Review of the Institution Decision and (ii) because of its lack of merit.

As the Petition explained (and PO has ignored), while the outer bounds of certain terms of the challenged claims are not well-defined, the teachings of the asserted references fall within the central core of these terms. (Pet., 45-46 & n.8.) In other words, while Petitioner challenged certain terms in the related litigation (now stayed pending IPR) as being indefinite terms of degree with unclear outer bounds (e.g., “optimized,” “maintain quality playback”), the Petition and its supporting evidence shows that, notwithstanding this indefiniteness, a POSA would have understood the teachings of Carmel, Mattavelli, Wang, and the other asserted references fall within the core scope of these terms and satisfy these claim limitations. *See Tesla, Inc. v. Intell. Ventures II LLC*, IPR2025-00340, Paper 18 at 3-4 (Director Nov. 5, 2025) (“*Tesla*”) (informative); (*see also* Pet., 35-55, 70-78; Carmel, 2:15-21, 8:42-9:9, 10:48-11:22, Figs. 3D, 6B (using “quality,” “playback,”

“synchronization,” and other similar terminology to describe maintaining fluid, quality playback); Mattavelli, 2309, 2311-12 (using term “optimization” when describing decoding processes akin to those later described in the ’849 patent used to speed up decoding); Wang, 51-54 (repeatedly describing its processes for speeding up decoding as “optimized”).)

Indeed, as discussed above, it is PO, not Petitioner, that has taken unjustified, inconsistent positions before the Board and the district court on the meaning and scope of the challenged claims. So too has PO’s expert, Mr. Goldman, regarding what Carmel teaches and what the challenged claims require. (*Compare* EX1080, EX1081, *with* EX2014.) Thus, it is PO, not Petitioner, that is attempting to thwart the Office’s goal of providing greater predictability and certainty in the patent system. *Tesla*, Paper 18 at 3-4.

The Board should reject PO’s inconsistent and incorrect arguments for the reasons discussed above. But, before the Board even considers the (lack of) merits of PO’s *de facto* claim construction positions (e.g., on “adjusting said selection and playback,” “maintaining playback quality”), the Board should first make certain that PO has clearly articulated and unambiguously adopted its positions in a way that binds PO and ensures that these interpretations are applied consistently across all potential future forums.

E. PO fails to show that the “maintain quality playback” term is not a statement of intended use

PO’s arguments that “to maintain quality playback” is not a statement of intended use are mistaken and should also be rejected. First, PO confusingly asserts that the functional term “to maintain quality playback” is “structural” simply because it modifies the “optimized decoding processes” term. (POR, 62-63.) PO also asserts—without explanation—that “to maintain quality playback” also modifies the “such that fluidity, video quality and audio quality are maintained” term. (*Id.*) PO offers no support, however, for the proposition that a functional limitation is transformed into a structural limitation when used as a modifier.

Next, contrary to PO’s assertions, it did not clearly rely on “to maintain quality playback” to distinguish the cited prior art during prosecution. (POR, 65-66.)

Finally, if the Board accepts PO’s argument that there is no presumption that the term “to maintain quality playback” is used differently between independent claims (POR, 67), all this means is that the Board should find that this term is a mere statement of intended use in independent claim 7 as well.

III. CONCLUSION

For these reasons and those provided in the Petition, the Board should find claims 1-9 unpatentable.

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CERTIFICATE OF COMPLIANCE WITH WORD COUNT

Pursuant to 37 C.F.R. § 42.24(d), I certify that this **PETITIONER'S REPLY TO PATENT OWNER'S RESPONSE** contains 5,589 words, according to the word-processing system used to prepare this paper, excluding the parts of this paper that are exempted by 37 C.F.R. § 42.24(a) (including the table of contents, a table of authorities, a certificate of service or this certificate word count, and appendix of exhibits).

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CERTIFICATE OF SERVICE

I hereby certify, pursuant to 37 C.F.R. § 42.6 that a true and correct copy of **PETITIONER'S REPLY TO PATENT OWNER'S RESPONSE**, and **Exhibit Nos. 1080-1085**, are being served electronically on April 17, 2026 to the e-mail addresses shown below:

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