

UNITED STATES PATENT AND TRADEMARK OFFICE

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BEFORE THE PATENT TRIAL AND APPEAL BOARD

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Google LLC,  
Petitioner,

v.

Withrow Networks Inc.,  
Patent Owner.

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

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**PATENT OWNER RESPONSE**

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## **TABLE OF CONTENTS**

|                                                                                                                                                                                                                                                           |    |
|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----|
| I. INTRODUCTION .....                                                                                                                                                                                                                                     | 1  |
| II. THE '849 PATENT .....                                                                                                                                                                                                                                 | 3  |
| A. The Technology Landscape of the Invention .....                                                                                                                                                                                                        | 3  |
| B. Background of the Patent .....                                                                                                                                                                                                                         | 8  |
| C. Overview of the '849 Patent.....                                                                                                                                                                                                                       | 11 |
| D. Challenged Claims.....                                                                                                                                                                                                                                 | 17 |
| E. Priority Date.....                                                                                                                                                                                                                                     | 19 |
| F. Prosecution History of the '849 Patent.....                                                                                                                                                                                                            | 19 |
| G. Person of Ordinary Skill in the Art (“POSITA”) .....                                                                                                                                                                                                   | 23 |
| III. CLAIM CONSTRUCTION.....                                                                                                                                                                                                                              | 23 |
| IV. OVERVIEW OF THE CITED REFERENCES .....                                                                                                                                                                                                                | 24 |
| A. Carmel (EX1003).....                                                                                                                                                                                                                                   | 25 |
| B. Mattavelli (EX1004).....                                                                                                                                                                                                                               | 26 |
| C. Wang (EX1007).....                                                                                                                                                                                                                                     | 27 |
| D. Wolters [EX1041].....                                                                                                                                                                                                                                  | 28 |
| E. Guo (EX1051), Yu (EX1061), and Forecast (EX1016).....                                                                                                                                                                                                  | 29 |
| V. THE PETITION FAILS TO PROVE BY A PREPONDERANCE<br>OF THE EVIDENCE THAT ANY OF THE CHALLENGED<br>CLAIMS ARE UNPATENTABLE.....                                                                                                                           | 29 |
| A. Carmel and Mattavelli Do Not Teach Or Suggest The<br>Challenged Claims (Ground 1).....                                                                                                                                                                 | 31 |
| 1. Carmel and Mattavelli Do Not Teach Or Suggest<br>“Autonomously Adjusting Said Selection and Playback<br>According To The Multimedia Object Parameters And Supplied<br>Host Path Identification” (Limitations 1[c.iii], 6[c.iii] and<br>7[c.iii]) ..... | 31 |
| 2. Carmel Does Not Teach or Suggest Maintaining Fluidity .....                                                                                                                                                                                            | 34 |
| 3. Carmel And Mattavelli Do Not Teach Or Suggest “Fluidity,<br>Video Quality and Audio Quality Are Maintained” In<br>Accordance With The Claim Limitations.....                                                                                           | 42 |

|                                                                                                                         |    |
|-------------------------------------------------------------------------------------------------------------------------|----|
| 4. Mattavelli Does Not Teach Or Suggest “To Maintain Quality Playback” (limitation 1[c.iv]) .....                       | 46 |
| B. Carmel and Wang Do Not Teach Or Suggest The Challenged Claims (Ground 2) .....                                       | 47 |
| 1. Carmel And Wang Do Not Teach Or Suggest “Utilizing Optimized Decoding Processes To Maintain Quality Playback.” ..... | 48 |
| 2. A POSITA would not have combined Carmel and Wang .....                                                               | 52 |
| C. Grounds 3-5 .....                                                                                                    | 55 |
| 1. Ground 3 .....                                                                                                       | 55 |
| 2. Grounds 4 and 5 .....                                                                                                | 58 |
| D. The Petition Fails Under 37 C.F.R. § 42.104(b)(3) .....                                                              | 60 |
| E. “To Maintain Quality Playback” In Claims 1 And 6 Is Not An Intended Use .....                                        | 61 |
| VI. CONCLUSION .....                                                                                                    | 69 |

## **TABLE OF AUTHORITIES**

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|                                                                                                         |        |
|---------------------------------------------------------------------------------------------------------|--------|
| <i>Arendi v. Apple Inc.</i> , 832 F.3d 1355 (Fed. Cir. 2016) .....                                      | 41     |
| <i>Dynamic Drinkware, LLC v. Nat'l Graphics, Inc.</i> ,<br>800 F.3d 1375 (Fed. Cir. 2015) .....         | 29     |
| <i>Intel Corp. v. Qualcomm Inc.</i> ,<br>21 F.4th 801 (Fed. Cir. 2021) .....                            | 62     |
| <i>Phillips v. AWH Corp.</i> ,<br>415 F.3d 1303 (Fed. Cir. 2005) .....                                  | 23, 67 |
| <i>Qualcomm Inc. v. Intel Corp.</i> ,<br>6 F.4th 1256 (Fed. Cir. 2021) .....                            | 24     |
| <i>Rowe v. Dror</i> ,<br>112 F.3d 473 (Fed.Cir.1997) .....                                              | 62     |
| <i>In re Stencel</i> , 828 F.2d 751 (Fed. Cir. 1987).....                                               | 62     |
| <i>Virtek Vision Int'l ULC v. Assembly Guidance Sys., Inc.</i> ,<br>97 F.4th 882 (Fed. Cir. 2024) ..... | 60     |
| <i>Vivid Techs., Inc. v. Am. Sci. &amp; Eng'g, Inc.</i> ,<br>200 F.3d 795 (Fed. Cir. 1999) .....        | 62     |

### **Statutes**

|                           |    |
|---------------------------|----|
| 35 U.S.C. § 316(e) .....  | 29 |
| 35 U.S.C. §312(a)(3)..... | 62 |

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|                                                                                                                            |    |
|----------------------------------------------------------------------------------------------------------------------------|----|
| <i>Deere &amp; Co. v. David's Dozer VLoc System, Inc.</i> ,<br>IPR2024-01442, Paper 10 at 28-30 (PTAB March 18, 2025)..... | 53 |
| <i>Revvo Techs., Inc. v. Cerebrum Sensor Techs., Inc.</i> ,<br>IPR2025 00632, Paper 20 (Director Nov. 3, 2025).....        | 61 |

*Tesla, Inc. v. Intellectual Ventures II LLC,*

IPR2025-00340, Paper 18 (Director Nov. 5, 2025) .....61

**Regulations**

37 C.F.R. § 42.104(b)(3)..... 60, 61

**EXHIBIT LIST**

| <b>Exhibit No.</b> | <b>Description</b>                                                                                                                                                                                                                                      |
|--------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>2001</b>        | <i>Withrow Networks, Inc. v. Google, LLC and YouTube, LLC</i> , No. 5:24-cv-03203-PCP (NDCA), Complaint file May 24, 2024 (D.I. 1) (“Complaint”)                                                                                                        |
| <b>2002</b>        | <i>Withrow Networks, Inc. v. Google, LLC and YouTube, LLC</i> , No. 5:24-cv-03203-PCP (NDCA), Order Denying Motion to Dismiss dated January 21, 2025 (D.I. 44) (“Order Denying Motion to Dismiss”)                                                      |
| <b>2003</b>        | <i>Withrow Networks, Inc. v. Google, LLC and YouTube, LLC</i> , No. 5:24-cv-03203-PCP (NDCA), Answer filed February 4, 2025 (D.I. 48) (“Answer”)                                                                                                        |
| <b>2004</b>        | <i>Withrow Networks, Inc. v. Google, LLC and YouTube, LLC</i> , No. 5:24-cv-03203-PCP (NDCA), the parties’ Joint Case Management Statement dated February 7, 2025 (D.I. 48) (“Joint Case Management Statement”)                                         |
| <b>2005</b>        | <i>Withrow Networks, Inc. v. Google, LLC and YouTube, LLC</i> , No. 5:24-cv-03203-PCP (NDCA), Motion to Stay Case Pending the Resolution of Petition for <i>Inter Partes</i> Review dated March 25, 2025 (D.I. 60) (“Motion to Stay”)                   |
| <b>2006</b>        | <i>Withrow Networks, Inc. v. Google, LLC and YouTube, LLC</i> , No. 5:24-cv-03203-PCP (NDCA), Opposition to Motion to Stay dated April 8, 2025 (D.I. 63) (“Opposition to Motion to Stay”)                                                               |
| <b>2007</b>        | <i>Withrow Networks, Inc. v. Google, LLC and YouTube, LLC</i> , No. 5:24-cv-03203-PCP (NDCA), Reply Re Motion to Stay Case Pending the Resolution of Petition for <i>Inter Partes</i> Review dated April 15, 2025 (D.I. 70) (“Reply re Motion to Stay”) |
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| <b>Exhibit No.</b> | <b>Description</b>                                                                                                                                                                                                                                |
|--------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|                    | Protective Order dated March 28, 2025 (“Order on Discovery Letter Brief”)                                                                                                                                                                         |
| <b>2010</b>        | <i>Withrow Networks, Inc. v. Google, LLC and YouTube, LLC</i> , No. 5:24-cv-03203-PCP (NDCA), Stipulated Protective Order dated April 10, 2025 (“SPO”)                                                                                            |
| <b>2011</b>        | Judge P. Casey Pitts Standing Order for Civil Cases (Aug. 2024)                                                                                                                                                                                   |
| <b>2012</b>        | Exhibit 0 to Invalidity Contentions Served in NDCA Litigation                                                                                                                                                                                     |
| <b>2013</b>        | <i>Withrow Networks, Inc. v. Google, LLC and YouTube, LLC</i> , No. 5:24-cv-03203-PCP (NDCA), The Parties’ Joint Claim Construction and Prehearing Statement dated June 23, 2025 (D.I. 92, 92-1) (“JCCPS”)                                        |
| <b>2014</b>        | Declaration of Matthew Goldman                                                                                                                                                                                                                    |
| <b>2015</b>        | December 17, 2025 Deposition Transcript of Nathaniel Polish, Ph. D.                                                                                                                                                                               |
| <b>2016</b>        | CV of Matthew Goldman                                                                                                                                                                                                                             |
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| <b>2019</b>        | Video titled “Movidity mymovy.com streaming video on BlackBerry 8700”, <i>available at</i> <a href="https://youtu.be/zN34b_MJKH8">https://youtu.be/zN34b_MJKH8</a> (last accessed January 18, 2026)                                               |
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| <b>Exhibit No.</b> | <b>Description</b>                                                                                                                                                                                                                                                                                                                                                   |
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| <b>2022</b>        | Printout of Garth Johnston, “ABC.com Unveils ‘HD’ Video Player,” Broadcasting & Cable, April 2, 2007 from Internet Archive.                                                                                                                                                                                                                                          |
| <b>2023</b>        | [reserved]                                                                                                                                                                                                                                                                                                                                                           |
| <b>2024</b>        | Pickle, Brian. “Buffer Definition.” TechTerms.com. (December 28, 2023). Accessed Jan 18, 2026.<br><a href="https://techterms.com/definition/buffer">https://techterms.com/definition/buffer</a>                                                                                                                                                                      |
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| <b>2031</b>        | Chang-Wen Chen & Houqiang Li, Video Streaming to Mobile Handheld Devices: Challenges in Decoding, Adaptation, and Browsing, in Proc. EX2031 IEEE Int’l Conf. on Multimedia & Expo 68, 68–75 (2007).                                                                                                                                                                  |
| <b>2032</b>        | Sean Michael Kerner et al., “3G (third generation of mobile telephony)”, Techtarget (April 2, 2021), <i>available at</i> <a href="http://www.techtarget.com/searchnetworking/definition/3G-third-generation-of-mobile-telephony">www.techtarget.com/searchnetworking/definition/3G-third-generation-of-mobile-telephony</a> ; <i>last accessed</i> January 23, 2026. |

## **I. INTRODUCTION**

The Petition fails to prove by a preponderance of the evidence that any challenged claim is unpatentable for the reasons discussed below.

First, for ground 1, Carmel and Mattavelli fail to teach or suggest “autonomously adjusting playback according to multimedia object parameters and supplied host path identification.” Carmel requests transmission of next segments with different rates in response to bandwidth limitations but does not discuss adjusting playback of the already downloaded segments according to multimedia object parameters and supplied host path identification. And Mattavelli simply does not address playback, let alone adjusting playback.

Second, Carmel fails to teach or suggest “fluidity,” and more specifically where “fluidity ... [is] maintained by ... utilizing optimized decoding processes to maintain quality playback.” Instead, Carmel discloses sequential real-time playback of received segments. Real-time playback, even with minimal decoding delay, is not synonymous with the claimed fluidity, let alone the maintenance of that fluidity. For example, even after decoding, there are certain steps, such as rendering of multimedia to the display, that may affect the fluidity of multimedia data display, depending on the memory, processing power and other hardware and software capabilities of the device.

Third, neither Carmel nor Mattavelli (individually or collectively) teaches the limitation “wherein the multimedia player is configured to play multimedia objects ... such that fluidity, video quality and audio quality are maintained by ... utilizing optimized decoding processes to maintain quality playback.” The Petition does not allege Carmel teaches maintaining fluidity, video quality and audio quality by utilizing optimized decoding processes to maintain quality playback.

Fourth, Mattavelli fails to teach or suggest maintaining quality playback. Instead, Mattavelli’s CGD process teaches degrading video quality, not maintaining fluidity, video quality and audio quality as required by the claims. Nor does Mattavelli’s discussion of real-time transmission disclose the limitation. Transmitting video in real time does not mean that Mattavelli maintains quality playback. Real-time transmission often has poor quality and fluidity and thus does not satisfy the limitation.

Ground 2 fails because of the deficiencies in Carmel discussed in ground 1. In addition, Carmel and Wang together do not teach or suggest “utilizing optimized decoding processes to maintain quality playback” as the Petition entirely fails to identify how Wang maintains quality playback. Further, a POSITA would not combine Carmel with Wang because doing so would render Carmel inoperable for its stated goal of implement media streaming for existing client hardware and software with limited processing and decoding power.

For ground 3, Wolters's HE-AAC teachings fail to disclose the claim limitation "utilizing optimized decoding processes." And for grounds 4 and 5, the Petition fails to provide rationales as to why Guo, Yu and Forecast would be combined with the hypothetical systems resulting from Carmel/Mattavelli and Carmel/Wang/Wolters.

Also, as discussed below, the term "to maintain quality playback" is not an intended use in any of the independent claims. Not only does "to maintain quality playback" provide structure to the claims, but it was also relied upon to distinguish over the prior art during prosecution, both of which entitle the limitation to patentable weight.

As discussed in more detail below, the Petition fails for at least these reasons. Many of the issues raised herein were not addressed in the Decision on Institution and/or raised in the preliminary response. Thus, the Board should issue a Final Written Decision holding all challenged claims not unpatentable.

## **II. THE '849 PATENT**

### **A. The Technology Landscape of the Invention**

During the early 2000s, mobile phones varied widely in hardware capabilities. This diversity in screen sizes, processor power, memory, and lack of dedicated media accelerators created significant challenges for delivering high-quality

streaming audio and video. Developers and content providers often had to make compromises, limiting quality or adopting lowest-common-denominator solutions to ensure streams would play on the broadest range of devices. EX2014 [Goldman Decl.], ¶27.

### **1. Fragmented Device Capabilities and Platform Diversity**

Mobile devices of that era came in an extraordinary variety of configurations, each with different multimedia support. EX2014 [Goldman Decl.], ¶28. Around the time of the patent’s filing, it was well known that “more than 100 models of current-generation mobile phones” were in active use, and video services tended to “behave differently from phone to phone.” EX2030 [Gerstel], 53.

### **2. Limited Processing Power and Lack of Hardware Acceleration**

Processor limitations were a central obstacle. Early mobile CPUs had only a fraction of the power of PC processors and often lacked any hardware acceleration for video decoding. EX2014 [Goldman Decl.], ¶29. It was well known that mobile devices were “significantly constrained by limited resources. EX2031 [Chen], 1. Specifically, available processing power limited the streaming capabilities of these early phones. *Id.*

Codec choices illustrate this lowest-common-denominator approach. EX2014 [Goldman Decl.], ¶30. For example, many mobile services in the mid-2000s relied on the older H.263 video codec, despite its poor compression efficiency, because it

had “extremely light” CPU decoding requirements suited to the modest CPU power in mobile devices. EX2030 [Gerstel], 51. This meant tolerating lower visual quality and higher bandwidth usage in order to ensure any playback on basic devices. Newer codecs like H.264 (MPEG-4 AVC) offered much better compression and quality, but without hardware decoder support they were often unusable on older phones. While in the mid-2000s it was anticipated that H.264 would soon become standard for mobile video, delivering “extraordinary image quality for a given data rate” (*id.* at 51), the reality was different. EX2014 [Goldman Decl.], ¶30. Within a few years, it was understood mobile devices could not feasibly perform “full scale decoding of the video compressed in H.264 standard.” EX2031 [Chen], 42. Instead, improved decoding for mobile devices was required to meet the needs of this new streaming standard. Industry soon thereafter agreed that complexity reducing methods were needed to effectively process video on mobile phones. *Id.*, 45 (“We will start with the most essential operations for such service in terms of reduced complexity video decoding on the mobile devices,” namely “[t]o develop a reduced complexity video coding scheme based on H.264/AVC standard.”).

### **3. Battery Life**

Battery life was another important factor. EX2014 [Goldman Decl.], ¶31; EX2031 [Chen], 42. Complex decoding of high-quality video would quickly drain a

mobile device's battery. This reinforced the need for processor efficient decoding solutions.

#### **4. Varying Screen Sizes and Resolutions**

Mobile screens in the early 2000s ranged from tiny low-resolution displays of 176 by 144 pixels (sub-QVGA,  $\frac{1}{4}$  or total pixels of a standard desktop VGA, flip phone) to slightly larger PDA screens. *See, e.g.*, EX2030, 50. This variability in screen size and resolution posed its own challenges for video streaming. *Id.*, 44 (“In particular, the display size of these devices can be quite different and the display resolution of these devices is usually much smaller than the resolution of original video.”). Thus, content formatted for a larger display often became illegible or unwatchable on smaller screens. EX2014 [Goldman Decl.], ¶32.

Moreover, the frame rates and resolutions usable on mobile were limited by both hardware and network. EX2014 [Goldman Decl.], ¶33. Typical mobile video streams were delivered at only about 8–10 frames per second, versus up to 30 fps of television. EX2030 [Gerstel], 50.

Thus, streaming services often capped the video resolution to match the smallest screens and used low frame rates, ensuring smooth playback even if it meant a sub-optimal quality.

## **5. Memory and Storage Constraints**

Early mobile devices also had limited memory, which affected streaming. For instance, mobile phones in 2005 typically had 32 to 64 MB of memory for video storage. EX2030 [Gerstel], 50. At typical mobile bitrates (~128 Kbps), this was only enough for about 34–68 minutes of video in total. If a user subscribed to multiple streaming content providers, each provider could only have a few minutes of video cached on the device. This storage cap forced providers to keep video clips short and low-quality (to reduce file size), or to frequently overwrite cached content. Even streaming (without storing the whole file) required some buffer memory – a scarce commodity on devices that often had under one or two dozen MB of free RAM, resulting in stalling or limiting the length of continuous playback. EX2014 [Goldman Decl.], ¶35.

In addition, the absence of ample memory meant less tolerance for high-bitrate streams. EX2014 [Goldman Decl.], ¶36. A large video buffer might overflow a device's memory, so streams were kept at bitrates that produced small, manageable buffers. This often translated to lower video quality so that each second of video consumed only a small amount of data, thereby pushing stream durations and bitrates to remain low.

## **6. Lowest-Common-Denominator Solutions for Mobile Streaming**

Facing this combination of tiny screens, weak processors, and minimal memory, streaming media providers around the time of the patent's filing had to optimize for the lowest common denominator device. EX2014 [Goldman Decl.], ¶37.

### **B. Background of the Patent**

The invention of the '849 Patent relates to “multimedia transmission and playback for mobile clients.” EX1001 ['849 Patent], 1:6-8. It has its origins in Withrow's predecessor entities LogoVision Wireless Inc. and Movidity Inc. (collectively referred to as “Movidity” herein)<sup>1</sup>, which in 2007 launched a mobile media sharing site, Movy.tv. EX2017 [movy.tv printout].

Movidity developed technology to enable smooth and quality video streaming over the Internet despite network bandwidth fluctuations and the limited hardware capabilities of mobile devices. Specifically, multimedia objects (a data structure) were used to implement adaptive bit rate (“ABR”) technology and optimized decoding to maintain visual presentation of streaming media.

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<sup>1</sup> Movidity was LogoVision's technology development entity. Both companies, now dissolved, are predecessors to Withrow.

Mobile streaming, with its diverse mobile device diaspora, posed unique problems. Industry consensus, such as through the World Wide Web Consortium (W3C), revealed that Internet-based mobile communications suffered due to widely varying device processor and graphics capabilities, as well as assorted screen sizes and resolution constraints. EX2014 [Goldman Decl.], ¶40.

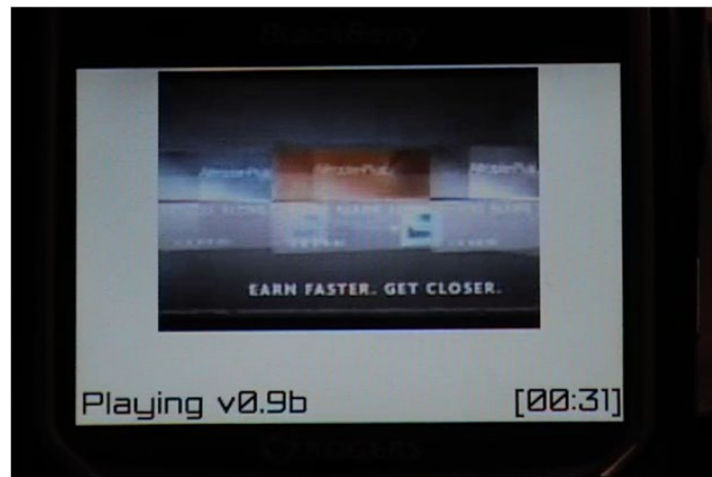
Traditional streaming could not adequately account for these myriad hardware constraints. For example, an old or low-end smartphone may have only been able to process video and audio at bitrates of 400 kbps and 64 kbps, respectively, at a frame size of 320 x 240 pixels, and at a reduced frame rate. In contrast, newer mobile hardware may have been capable of exceeding video and audio bitrates of 3.5 mbps and 160 kbps, respectively, at a frame size of 1280 x 720 pixels, and at a frame rate of 30 fps. EX2014 [Goldman Decl.], ¶41.

Further exacerbating these issues was that mobile devices lacked processing power. [Goldman Decl.], ¶42. Thus, decoding the video stream, without more, would lead to problematic playback. [Goldman Decl.], ¶107 (describing stutter and jitter issues). A solution was needed so that multimedia could be streamed across different bandwidths and different hardware.

Movidity solved these problems by, among other things, creating a streaming data structure composed of video files and information describing the video streams, so as to account for mobile device design diversity. Moreover, the otherwise

negative byproduct of limited processing capabilities was mitigated through the use of optimized decoding processes. The result was playback of computationally intensive media even on modest mobile device hardware.

Below is an example from 2006 of Movidity's Adaptive Bit Rate (ABR) technology on a Blackberry device:



See EX2019 [Movidity video] at 1:27, available at [https://youtu.be/zN34b\\_MJKH8](https://youtu.be/zN34b_MJKH8), last accessed January 18, 2026.

Movidity's technology was immediately recognized as groundbreaking. In December 2005—before any Movidity or Withrow patents had issued—ARM Ltd., the primary microprocessor provider at the time for mobile phones, licensed the technology to demonstrate high-performance MPEG-4 Part 2 video streaming. EX2020 [Movidity Press Release]. By mid-2006, the Movidity mobile ABR

technology was being demonstrated on major platforms, such as those of Qualcomm and Sprint:

Specifically, ARM will be demonstrating the Movidity player upon a Qualcomm platform, with Sprint's mobile wireless network. This joint demonstration between ARM, Sprint, Qualcomm and Movidity underscores the significance of each organization in the realm of advanced mobile multimedia. The performance of Movidity's multimedia player will be matched with the capabilities of the ARM enabled Qualcomm mobile device platform and Sprint's advanced wireless network, allowing attendees to experience the next generation in mobile multimedia.

*Id.*

In addition to working with hardware manufacturers, by 2007 Movidity developed Movy.tv—a client facing mobile ABR media sharing system that provided live and on-demand video streaming. EX2017 [Movy.tv printout].

By the time Petitioner Google and RPI YouTube implemented their own technologically competing site around 2009, Movy.tv had been using network bandwidth adaption and optimized decoding in the much more demanding space of mobile devices for years.

### **C. Overview of the '849 Patent**

The '849 Patent embodies Movidity's innovative mobile device ABR technology. As discussed above, prior to the effective filing date in April 2005, methods of distributing multimedia data over the wireless internet to mobile clients were “constrained by existing wireless bandwidth, and the real-time decoding, processing and displaying of multimedia content with limited hardware capabilities.” *Id.*, 1:13-16. “These hardware limitations include slow CPUs, high

memory latencies, slow drawing capabilities and the absence of YUV to RGB conversion [*i.e.*, *i.e.*, transforming color information from one color space to another] in the hardware.” *Id.*, 1:16-20. Most mobile devices could not support multimedia playback, and even on those that could, video was limited to low frame rates and suffered from minimal bandwidth. *Id.*, 1:33-48. Decoders for complex video (*e.g.*, MPEG4) and audio (*e.g.*, AAC) were known but “require[d] multiple parallel processes and fast processing,” which were not available on mobile devices at the time. *Id.*, 1:49-60. While Java players for cell phones had been developed, “implementations of true, platform independent, MPEG4 Java decoders that will play video on cell phones [were] not known” and “no Java players [were] known that will play AAC [audio].” *Id.*, 2:4-18. And although streaming technologies were in development, they did “not address specific continuity and deployment issues for wireless multimedia transmission and concurrent playback on a limited-tasking cell phone handsets.” *Id.*, 2:19-43. *See* EX2014 [Goldman Decl.], ¶43.

These limitations rendered conventional streaming technologies inadequate, often resulting in poor video and audio quality or preventing playback altogether. EX2014 [Goldman Decl.], ¶44. The ’849 Patent and its ancestor applications sought to address these limitations by, among other things, expanding and improving on prior methods for multimedia transmission and mobile playback, enabling fluid

playback of high-quality video and audio on constrained mobile devices. *Id.*, 2:44-46.

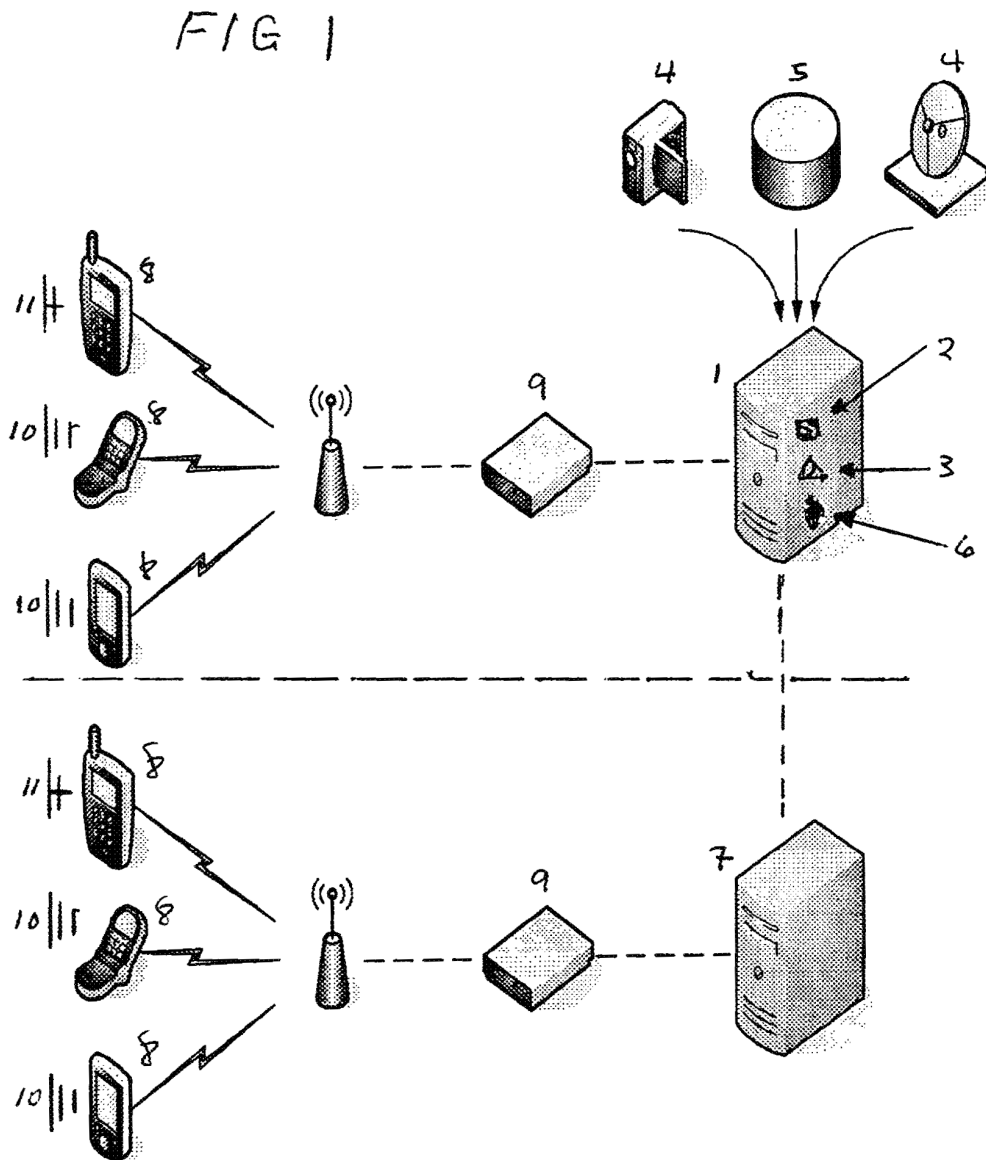
The '849 Patent discloses a comprehensive solution comprising several interrelated aspects. EX2014 [Goldman Decl.], ¶45. The patent explains:

In a *first aspect* the invention provides a method of efficient multimedia object creation. In a *second aspect* the invention deployment addresses the limitations of large-scale multimedia transmission on cellular networks to wireless clients. In a *third aspect*, the invention relates to methods of decoding of video, sufficiently optimized to be played on a limited wireless client. In a *fourth aspect*, the invention relates to methods of decoding of audio, sufficiently optimized to be played on a limited wireless client. In a *fifth aspect*, the limited mobile handset multimedia object player, for both MPEG4 video decoding and AAC audio decoding, is implemented as a device-hardware-independent java (J2ME) applet.

*Id.*, 2:50-63 (emphasis added). These novel features were not previously known in the art and contributed to solving the problems with conventional methods for multimedia transmission and playback on mobile devices. EX2014 [Goldman Decl.], ¶45.

### **1. The '849 Patent's "Distributed Network System for Multimedia-on-Demand"**

As shown below, Figure 1 of the '849 Patent discloses a "distributed network system for multimedia-on-demand." *Id.*, 4:66-5:7, Fig.1.



The system includes a centralized content server (1) with a transcoder (2) and multimedia object creator (3) that creates multimedia objects from live broadcasts (4) or archived multimedia files (5). The centralized content server (1) includes an indexing host system (6) to deploy multimedia objects to content servers (7) and wireless clients (8). Proxy cellular network http servers (9) cache multimedia objects

for efficient delivery to wireless clients (8), which run novel multimedia object java applets (10) or embedded/downloaded multimedia players (11). *See id.*, 4:66-5:7, 6:18-31. *See* EX2014 [Goldman Decl.], ¶48.

## **2. The '849 Patent Teaches a Novel Multimedia Player that Maintains Fluidity, Video Quality and Audio Quality**

The system disclosed in the '849 Patent provides technological advantages over prior approaches by employing a novel multimedia player that maintains fluidity and quality by selecting multimedia objects that reflect available network bandwidth, autonomously adjusting selection and playback according to multimedia object parameters and supplied path identification, and using optimized decoding processes to maintain quality playback. *See, e.g., id.*, cls. 1, 6, 7. These operations are performed together and all are performed at the mobile client itself, rather than being handled at the server or network level. *Id.* This local control allows for adaptation to the device's processing capacity and network conditions, ensuring that video and audio playback remain synchronized and maintain acceptable quality and fluidity. EX2014 [Goldman Decl.], ¶49.

The decoder optimizations and strategies used by the multimedia player allow playback of live audio and video on mobile devices:

In FIG. 1 the multimedia object player 10 is a downloadable Java (J2M2) applet and ***the described audio and video decoder optimizations and strategies, FIGS. 7-13 and FIGS. 15-20, as applied***

*to standard MPEG4 and AAC decoding 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.*

Java cannot take advantage of hardware capabilities in processing the huge number of calculations and variables required for either MPEG4 decoding or AAC decoding.

*Id.*, 18:64-19:9 (emphasis added). These optimizations “permit the playback of AAC and MPEG4 on current mobile client hardware” and “are a source of technological innovation and advance.” *Id.*; *see also id.*, 4:44-57. *See* EX2014 [Goldman Decl.], ¶50.

The '849 Patent discloses a number of novel optimized decoding processes for video and audio decoding on limited mobile devices. *Id.*, 4:7-43. With respect to optimized video decoding, the patent describes, for example, optimized Huffman codebook methods for video decoding, texture buffering, motion compensation without bilinear interpolation, optimized pixel processing and dequantization, novel uses of Chen's algorithm, novel YUV to RGB conversions, and decoding shortcuts. *Id.*, Figs.7-13; *see also generally id.*, 11:28-14:60. The patent further describes optimized audio decoding processes, including for instance optimized Huffman codebook methods for audio decoding, optimized IMDCT implementation, input short-cut processes specific to AAC Low Complexity (LC) audio decoding profile, IMDCT short window processing, and low energy gap timing. *Id.*, Figs.15-20; *see*

*also generally id.*, 15:12-18:63. *See* EX2014 [Goldman Decl.], ¶51. And further, these optimized processes sought to overcome the problem that “[t]ypical mobile processors have integer math only, [and] little or no on-CPU cache” requiring techniques of “getting maximum” quality out of these very limited devices. 4:26-30. *See also*, EX1001 [’849 Patent], 12:60-63 (“The use of an effective integer-based algorithm is an absolute requirement when the decoding occurs on constrained devices.”).

In sum, the ’849 Patent describes a coordinated solution that overcomes the technical challenges of multimedia playback on mobile clients with constrained resources. Its combination of multimedia object transmission, content delivery, and sophisticated multimedia player that employs decoding optimizations implemented entirely within the client itself represented a significant advance over the prior art at the time of the invention in 2005. EX2014 [Goldman Decl.], ¶53.

#### **D. Challenged Claims**

The Petition treats independent claims 1, 6 and 7 as “materially the same.” Pet., 65-67. Claim 1 is representative:

|                                                                                                          |
|----------------------------------------------------------------------------------------------------------|
| [preamble] A method comprising:                                                                          |
| [a.i] receiving audio and video segments encoded in a digital encoding format and with an encoding rate; |

|                                                                                                                                                                   |
|-------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| [a.ii] wherein, said audio and video segments are associated with object parameters and supplied host path identification to form multimedia objects;             |
| [1.b.i] requesting by a multimedia player, transmission of said multimedia objects;                                                                               |
| [b.ii] wherein said multimedia objects are located using http and received by said multimedia player from servers using a wireless connection;                    |
| [c.i] playing back received multimedia objects by the multimedia player,                                                                                          |
| [c.ii] wherein the multimedia player is configured to play multimedia objects in a sequence such that fluidity, video quality and audio quality are maintained by |
| [c.ii] selecting a plurality of said multimedia objects that reflect available network bandwidth,                                                                 |
| [c.iii] autonomously adjusting said selection and playback according to the multimedia object parameters and supplied host path identification, and by            |

[c.iv] utilizing optimized decoding processes to maintain quality playback.

#### **E. Priority Date**

The '849 Patent is a continuation of U.S. App. No. 15/016,821, filed on February 5, 2016, which published as U.S. Patent No. 10,171,873. EX1001 ['849 Patent], [63]. The '821 Application is a continuation of U.S. App. No. 11/107,952, filed on April 18, 2005, which is abandoned. *Id.* The earliest effective filing date of the claims of the '849 Patent is therefore April 18, 2005. Petitioners do not challenge the April 18, 2005 earliest effective filing date in the Petition. *See* Pet., 6; EX2014 [Goldman Decl.], ¶56.

#### **F. Prosecution History of the '849 Patent**

The '849 Patent issued from U.S. App. No. 16/181,285 (“the '285 Application”), filed on November 5, 2018. EX1001 ['849 Patent], [21-22].

Following several rejections by the Examiner and claim amendments by the applicant, the '285 Application was allowed. In an April 16, 2020 response,, the Applicant distinguished the Vetro reference in part by distinguishing maintaining semantic fidelity and further compression (in Vetro) from maintaining smooth quality playback (as claimed in the '849 Patent):

Maintaining semantic fidelity and further compression are NOT the same as optimized player decoding. Semantic fidelity is based on extracted bitstream characteristics for encoding and transmission control by using the Vetro predictor model and transcoder to adaptively adjust the bitstream for network bandwidth and to tailor it to operational player characteristics/limitations. Maintaining smooth quality playback, based on playback efficiency in my specification, involves other factors, and involves dynamic player executed configurations and optimized decoding, based on the parsed multimedia objects.

EX1008 [FH], 582.

In response, the Examiner issued a Notice of Allowance on July 2, 2020.

According to the Examiner:

Independent claim 33 recites the following limitation: “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”. This limitation of independent claim 1 in combination with the other limitations recited in the claim is the reason for allowance.

EX1008 [FH], 589. Thus, the claimed “multimedia player” in combination with the claimed steps for maintaining fluidity, video quality and audio quality, was identified as the “reason for allowance.” *Id.*

These features (*e.g.*, the “multimedia player” that “is configured to play multimedia objects in a sequence such that fluidity, video quality and audio quality are maintained” by (1) “selecting...,” (2) “autonomously adjusting...,” and (3)

“utilizing optimized decoding processes to maintain quality playback”), among others disclosed and claimed in the ‘849 Patent, distinguish it from the alleged prior art relied upon by Petitioner in this proceeding.

**1. The Examiner cited and considered Carmel**

During prosecution of the ‘849 Patent, Carmel (EX1003), Carmel ’432 patent (EX1009) and Carmel ’230 Patent (EX1010) were each reviewed and cited by the Examiner:

(56)

**References Cited**

**U.S. PATENT DOCUMENTS**

.....

|           |      |         |               |
|-----------|------|---------|---------------|
| 5,821,986 | A    | 10/1998 | Yuan et al.   |
| 5,841,432 | A    | 11/1998 | Carmel et al. |
| 5,892,915 | A    | 4/1999  | Duso et al.   |
| .....     |      |         |               |
| 6,385,596 | B1   | 5/2002  | Wiser et al.  |
| 6,389,473 | B1   | 5/2002  | Carmel et al. |
| .....     |      |         |               |
| 6,397,230 | B1   | 5/2002  | Carmel et al. |
| 6,490,320 | B1 * | 12/2002 | Vetro .....   |

EX1001 [‘849 Patent], page 2 (under “(56) References Cited”).

The Applicant disclosed Carmel, the Carmel ’432 Patent and the Carmel ’230 Patent to the Examiner in an Information Disclosure Statement dated November 5, 2018:

|           |         |    |            |               |
|-----------|---------|----|------------|---------------|
| 12        | 5841432 | A  | 1998-11-24 | Carmel et al. |
| . . . . . |         |    |            |               |
| 34        | 5397230 | B1 | 2002-05-28 | Carmel et al. |
| 35        | 5536043 | B1 | 2003-03-18 | Guedalia      |
| 36        | 5389473 | B1 | 2002-05-14 | Carmel et al. |

EX1008 ['849 Patent Prosecution History], 141 (Carmel '432 Patent), 143 (Carmel and the Carmel '230 Patent).

The Examiner considered Carmel, the Carmel '432 Patent, and the Carmel '230 Patent. On September 13, 2019, the Examiner initialed the Information Disclosure Statement, indicating "All References Considered Except Where Lined Through. /K.D./":

|                                                              |
|--------------------------------------------------------------|
| ALL REFERENCES CONSIDERED EXCEPT WHERE LINED THROUGH. /K.D./ |
|--------------------------------------------------------------|

EX1008 ['849 Patent Prosecution History], 524 (for the Carmel '432 Patent), 526 (for Carmel and the Carmel '230 Patent). Thus, the Examiner allowed the challenged claims after considering Carmel (the primary reference here), as well as the '432 Carmel Patent and '230 Carmel Patent.

### **G. Person of Ordinary Skill in the Art (“POSITA”)**

The level of ordinary skill in the art as of the priority date for the inventions claimed in the ’849 Patent is a person with a bachelor’s degree in electrical engineering, computer engineering, computer science, or a related field, and two to three years of experience in the design or development of (1) video processing systems, audio processing systems, and/or the equivalent; and (2) networking and communications systems, or the equivalent. Additional graduate education could substitute for professional experience, or significant experience in the field could substitute for formal education. EX2014 [Goldman Decl.], ¶61.

The DI found no material difference between PO’s proposed level of ordinary skill and Petitioner’s, and that the obviousness analysis would be the same under each party’s assessment. Paper 12 [DI], 11. For the purposes of this IPR, PO agrees that the analysis would be the same under either level of ordinary skill.

### **III. CLAIM CONSTRUCTION**

Except as noted below, the terms of the ’849 Patent should be given their ordinary and customary meaning as would be understood by a POSITA in light of the intrinsic record. *See Phillips v. AWH Corp.*, 415 F.3d 1303, 1313 (Fed. Cir. 2005) (*en banc*).

The Parties have submitted proposed constructions for certain terms in the parallel district court litigation. EX2013 [Joint Claim Construction Statement].

Petitioner proposed the claim terms “optimal,” “optimal digital format,” “optimal encoding rate,” “optimized decoding process,” “fluidity,” “video quality and audio quality are maintained,” and “maintain quality playback” are indefinite. EX2013 [Joint Claim Construction Statement], 6-12. In this IPR, “Petitioner does not contend any terms require express construction.” Pet., 13. Petitioner does not provide any explanation for asserting different positions in the IPR and district court. *Id.*

Patent Owner believes it has interpreted the claim terms consistently with its positions in district court. EX2014 [Goldman Decl.], ¶66. Because none of the prior art references relied on in the Petition—alone or combined—disclose the limitations of independent claims 1, 6, and 7 under any reasonable construction, Patent Owner does not believe any terms of the ’849 Patent require express construction for purposes of this IPR. EX2014 [Goldman Decl.], ¶¶65-66. If Petitioner or the Board construes any other terms in this IPR, Patent Owner reserves the right to respond. *See Qualcomm Inc. v. Intel Corp.*, 6 F.4th 1256, 1267 (Fed. Cir. 2021).

#### **IV. OVERVIEW OF THE CITED REFERENCES**

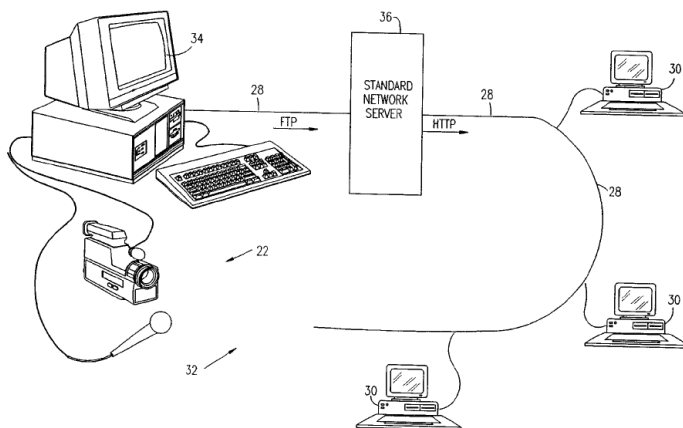
The petitioned grounds are shown below:

| Ground | Claims | Basis for Challenge under §103(a)                      |
|--------|--------|--------------------------------------------------------|
| 1      | 1-9    | Carmel in view of Mattavelli                           |
| 2      | 1-9    | Carmel in view of Wang                                 |
| 3      | 1-9    | Carmel in view of Wang and Wolters                     |
| 4      | 1-9    | Carmel in view of Wang, Wolters, Guo, Yu, and Forecast |
| 5      | 1-9    | Carmel in view of Mattavelli, Guo, Yu, and Forecast    |

Pet., 3.

#### A. Carmel (EX1003)

Carmel relates to “real-time multimedia broadcasting over a network.” EX1003 [Carmel], 1:11-13; *See* EX2014 [Goldman Decl.], ¶¶68. Multimedia data is prepared and transmitted over a network in real-time from a transmitting computer 34 to one or more client computers 30 (e.g., conventional personal computers or workstations). *Id.*, 2:1-21. *See* EX1001 [’849 Patent], Fig. 1:



To prepare the multimedia data, Carmel teaches dividing a media stream into slices and forming them as a sequence of files. EX2014 [Goldman Decl.], ¶¶69. The files are then transmitted to the client computer (upon client's request) over the network. EX1001 ['849 Patent], 2:1-21.

Carmel also teaches using indexing and timing information to ensure proper synchronization and playback of content by the client computer. Carmel explains that the system monitors time codes “to ensure that the transmission or reception is ‘keeping up’ with the input of the data,” and if lag is detected, “steps are taken” to increase throughput. *Id.*, 3:36–41. This mechanism ensures that the segments are transmitted in real time. *See* EX2014 [Goldman Decl.], ¶¶70.

Upon download, the multimedia sequence is decoded and played back “just as it was input” at the transmitting computer 34. *Id.*, 10:50-54. *See* EX2014 [Goldman Decl.], ¶¶71. In other words, Carmel teaches decoding and playing back at the client computer 30 the *unmodified* multimedia sequence of files regardless of the client computer's existing processing constraints.

#### **B. Mattavelli (EX1004)**

Mattavelli discloses a “Computational Graceful Degradation (CGD) approach for the implementation of video decoding.” EX1004 [Mattavelli], 1. According to Mattavelli, “[t]he main rationale of [CGD] is to provide results of poorer quality

when the results of the desirable quality cannot be obtained in real time.” EX1004 [Mattavelli], 1 (emphasis added). See EX2014 [Goldman Decl.], ¶72.

According to Mattavelli, the CGD approach results in “lower,” “poorer,” and “degraded” quality video. See *id.*, 1 (“The goal is to provide results of *possibly lower visual quality*, but respecting the real-time constraints, when the required processing needs exceed the available processing resources.”) (emphasis added), 1 (“When the complexity of the task exceeds the available processing power, realtime services, possibly of *degraded quality*, are nevertheless guaranteed respecting all real-time constraints.”) (emphasis added), 1 (“In our case, the goal is to guarantee real-time video decoding with possible *degradation of the image quality, i.e. reduction of the peak signal to noise ratio (PSNR)*, without losing [sic] parts of the image content.”) (emphasis added), 4 (“Obviously, the execution of any  $f_i^{\text{CGD}}$  may *produce PSNR degradations in the reconstruction of some image parts....*”) (emphasis added). See EX2014 [Goldman Decl.], ¶73.

### C. Wang (EX1007)

Wang discloses a “baseline MPEG-4 AVC (Advanced Video Coding) decoder based on an optimized platform-based design methodology” that “jointly optimize[s] the software and hardware design of the decoder.” EX1007 [Wang], 1 (emphasis added). According to Wang, its platform-based prototype “has multiple advantages including efficient system-level design methodology, short time-to-market,

reusability of software and hardware IP blocks, feasible chip integration, Etc. Thus, the platform-based design methodology is adopted for this project.” *Id.*, 2 (emphasis added). Wang summarizes its platform-based decoder as follows:

To address the problems of extended design cycle and less performance in the case of general purpose processor, *we propose an optimized platform-based architecture with macroblock (MB) level pipelining to implement a baseline MPEG-4 A VC decoder.* On this platform, *a general purpose processor controls the decoding processes and dedicated acceleration modules are used to speed up the computationally intensive tasks.* The accelerators are realized with programmable logic modules to retain the flexibility. In addition, a specific system bus is used to remove the bottleneck for data communications between modules. Subsequently, the proposed architecture is evaluated on an ARM966 platform. Our results show that the optimized software without hardware acceleration can achieve a decoding rate up to 5 frames per second (fps) for the video sequences in QCIF resolution. *With the new dedicated accelerators, the decoding throughput is increased by about 30% to reach 6.6 fps on the average and is up to 10.3 fps for slow motion video sequences.*

*Id.*,1 (emphasis added). See EX2014 [Goldman Decl.], ¶74.

#### **D. Wolters [EX1041]**

Wolters relates to a computationally intensive audio compression standard called High-Efficiency Advanced Audio Coding (HE AAC). EX1041 [Wolters], 1. Wolters “provides an implementation guideline and provides an overview of the

technologies and system integration aspects of HE AAC.” *Id.*, 2; EX2014 [Goldman Decl.], ¶75.

**E. Guo (EX1051), Yu (EX1061), and Forecast (EX1016)**

Petitioner relies on Guo, Yu, and Forecast in grounds 4 and 5. Specifically, Petitioner relies on: (1) Guo for “teachings on the use of multiple servers to serve multimedia segments ((possibly) recited in claim element 1[b.ii])”; (2) Yu for “teachings regarding transcoding (recited in claims 3 & 8)”; and (3) Forecast for “teachings regarding splitting a video stream at an I-frame (recited in claims 4 & 5).” *See* Pet. at 78, 86; EX2014 [Goldman Decl.], ¶¶76-79.

**V. THE PETITION FAILS TO PROVE BY A PREPONDERANCE OF THE EVIDENCE THAT ANY OF THE CHALLENGED CLAIMS ARE UNPATENTABLE**

“In an inter partes review, the burden of persuasion is on the petitioner to prove unpatentability by a preponderance of the evidence, 35 U.S.C. § 316(e), and that burden never shifts to the patentee.” *Dynamic Drinkware, LLC v. Nat’l Graphics, Inc.*, 800 F.3d 1375, 1378 (Fed. Cir. 2015) (internal citations and quotations omitted). The Petition fails to prove unpatentability for any ground in the Petition.

First, Carmel-Mattavelli combination (Ground 1) fails because it does not disclose or suggest (a) the claimed fluidity or quality that is maintained by using all

three identified steps; or (b) the third step of utilizing optimized decoding processes to maintain quality playback.

Neither reference mentions fluidity, let alone maintaining fluidity or quality by using three separate steps: (1) selecting objects that reflect available network bandwidth, (2) adjusting the selection and playback according to the multimedia object parameters, or (3) using optimized decoding processes to maintain quality playback. The Petition simply does not identify any teachings in Carmel related to maintaining quality playback.

The Carmel-Wang combination of ground 2 also fails because of the deficiencies discussed for ground 1. A POSITA also would not have combined Wang with the system in Carmel because implementing Wang's prototype client-side decoder is incompatible with Carmel's goal of implement media streaming over existing client hardware and software circa 1998.

Grounds 3-5 depend on grounds 1 and 2 and thus fail for the same reasons. For grounds 4 and 5, Petitioner fails to provide a rationale for combining Guo, Yu and Forecast with the underlying systems of Carmel and Mattavelli in ground 1 (for ground 5) or Carmel, Wang and Wolters in ground 3. Instead, Petitioner incorrectly assumes that these references are combined with Carmel alone.

Finally, "to maintain quality playback" is not an intended use. As the Decision on Institution noted, claim 7 recites "configured to," indicating "to maintain quality

playback” is not an intended use in claim 7. Substantively identical language is used in claims 1 and 6. Moreover, “to maintain quality playback” is structural in nature and was relied upon during prosecution to distinguish the prior art. Accordingly, “to maintain quality playback” is entitled to weight in each asserted claim.

**A. Carmel and Mattavelli Do Not Teach Or Suggest The Challenged Claims (Ground 1)**

**1. Carmel and Mattavelli Do Not Teach Or Suggest “Autonomously Adjusting Said Selection and Playback According To The Multimedia Object Parameters And Supplied Host Path Identification” (Limitations 1[c.iii], 6[c.iii] and 7[c.iii])**

The Petition alleges Carmel and Mattavelli disclose limitation 1[c.iii] and the corresponding limitations in claims 6 and 7. Pet., 40-45, 65-67. Neither reference discloses autonomously adjusting playback according to multimedia object parameters and supplied host path identification.

The '849 Patent explains that wireless multimedia streaming in April 2005 was “constrained by ... the real-time decoding, processing and displaying of multimedia content with limited hardware capabilities.” EX1001 ['849 Patent], 1:12-16. Thus, on the client side, “[t]he buffering and playback of multimedia objects in a synchronized fashion is critical to fluid playback.” *Id.*, 3:38-43. That is, different mobile phones at the time had different capabilities (e.g., different amounts of processing power and memory, different screen sizes and resolutions, etc.). This

claim limitation recognizes that the playback on a given device is adjusted according to multimedia object parameters such as the size of the visual frame. *Id.*; EX2014 [Goldman Decl.], ¶96. So, for example, different frame sizes must be adjusted to display correctly on different screen sizes. *Id.*

Carmel discloses selecting a transmission quality level based on available bandwidth. Pet., 41-42; EX1003 [Carmel], 11:2-7 (“After reading header 43 and, preferably, making an initial assessment of the link bandwidth, the client selects one of the available quality levels in the stream..”). But this assessment involves adjusting the quality level of the data stream (i.e., “the rate of data transfer over the link from the server” (EX1003 [Carmel], 11:9-11)), not the playback of the data. EX2014 [Goldman Decl.], ¶97.

The Petition argues that Carmel “teaches and suggests that the client/multimedia player is configured to identify and locate ... the successive slices (having a new quality level) that the media player will receive, decode and output/play.” Pet., 42-43 (*citing* EX1003 [Carmel], 10:64-11:22, Fig. 6B). Nothing in the cited portion of Carmel discusses any change to the playback itself, let alone adjusting playback according to multimedia object parameters and supplied host path identification. Instead, the citation discloses that the audio/video level is determined based on the “link rate.” *Id.*, Fig. 6B. EX2014 [Goldman Decl.], ¶98.

The Petition cites Carmel 7:28-49 (Pet., 43), but that section discusses “adjust[ing] the data streaming rate to the available bandwidth.” EX1003 [Carmel], 7:28-49. It does not discuss adjusting the playback. Similarly, the Petition cites Carmel 10:48-63 (Pet., 43). That section states “[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***, preferably with only a minimal necessary transmission and decoding delay.” EX1003 [Carmel], 10:50-54 (emphasis added). . “Just as it was input” at computer 34 (*i.e.*, Carmel’s transmitting computer) indicates that media is played in the same order as it was input. Minimal necessary “decoding delay” is directed to real-time aspect of Carmel’s invention, which is different from the concept of fluidity or maintenance thereof as explained *infra*, §V.2. The multimedia slices use time stamps so that they are played back in the correct order. The section has nothing to do with ***adjusting playback*** according to multimedia object parameters and supplied host path identification. EX2014 [Goldman Decl.], ¶99.

Because Carmel does not disclose this limitation, the Petition argues alternatively that Mattavelli discloses the limitation. Pet., 44-45. But Petitioner generically argues that “Mattavelli teaches techniques where the decoder/media player uses object parameters (including, *e.g.*, decoding complexity metadata that is available with the MPEG-4 standard) to determine when and by how much to adjust the decoding/playback of received video segments.” (citing EX1007 [Mattavelli]

2309, 2310-2311 and EX1002 [Polish Decl.], ¶197). None of the cited portions of Mattavelli discuss adjusting playback according to multimedia object parameters and supplied host path identification. EX2014 [Goldman Decl.], ¶100. Instead, the cited portions discuss executing CGD based on “predicted decoding time” and “complexity information.” EX1007 [Mattavelli] 2309, 2310-2311; EX1002 [Polish Decl.], ¶197. Indeed, Mattavelli does not even use the term “playback.” EX1007 [Mattavelli]; EX2014 [Goldman Decl.], ¶100. Thus, Carmel and Mattavelli do not teach or suggest this limitation.

## **2. Carmel Does Not Teach or Suggest Maintaining Fluidity**

Claim 1.c.ii requires “wherein the multimedia player is configured to play multimedia objects in a sequence such that fluidity, video quality and audio quality are maintained by” performing three distinct claimed steps. EX1001 [’849 Patent], cl. 1. The Petition alleges Carmel alone satisfies this limitation. Pet., 35-40.

“Fluidity” refers to the smoothness and continuity of playback as perceived by the viewer, specifically the absence of jitter, freezes, or choppiness. EX2014 [Goldman Decl.], ¶102; EX2013 [Joint Claim Construction Statement]; 13; EX2026 [Pastrana-Vidale], 2; EX2027 [Casale], 3. A video is fluid only when playback is sufficiently stable and proceeds without interruptions or irregular timing.

The ’849 Patent discusses that “buffering and playback of multimedia objects in a synchronized fashion is critical to fluid playback.” EX1001 [’849 Patent], 3:43-

45. The use of “buffering” further indicates that fluid playback means continuous, smooth playback. EX2014 [Goldman Decl.], ¶103. A buffer “smooths out a data transfer when one side has a slower connection or less processing ability than the other side.” EX2024 [Techterms]; *see also* EX2014 [Goldman Decl.], ¶103.

Carmel does not disclose maintaining fluidity of playback as required by the claims. EX2014 [Goldman Decl.], ¶104. The terms fluidity and fluid are completely missing from Carmel. EX1003 [Carmel]. While the Petition often states that Carmel discloses maintaining fluidity, the portions of Carmel cited by Petitioner do not mention fluidity. Pet., 35-40. EX2014 [Goldman Decl.], 104.

The cites from Carmel in the Petition generally discuss sequencing data slices. *See id.* But playing back data slices in the same sequence they were input does not guarantee that the playback will be fluid. EX2014 [Goldman Decl.], ¶104. A video may have data in the correct order yet lack fluidity and quality due to buffering, system delays, client device processor bottlenecks, or frame dropping. EX2014 [Goldman Decl.], ¶104.

In order for playback to be fluid, the three steps claimed in the ’849 Patent must be taken (*see* Exhibit 1001 [’849 Patent], cl. 1). Otherwise, other issues could impact fluidity. For example, network bandwidth may be insufficient to deliver selected data segments, or processing and memory limitations in the decoder device

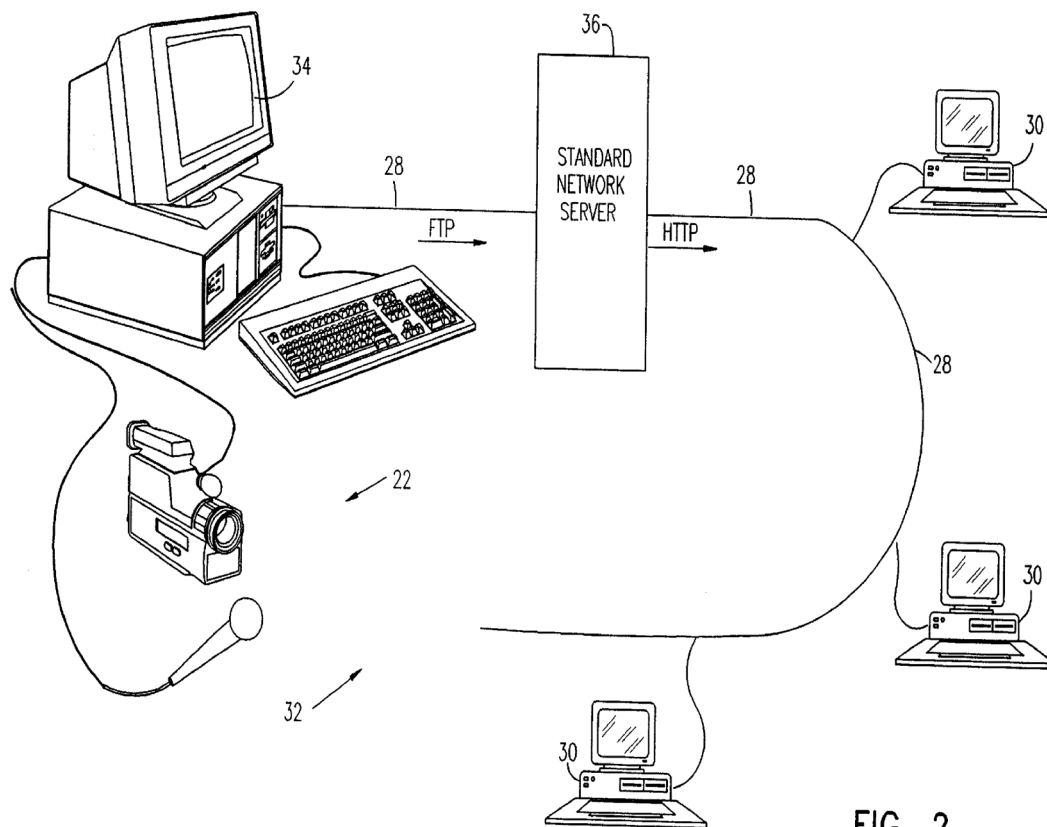
may prevent the processing of media segments. *Id.* Either of these occurrences will disrupt fluidity of playback regardless of sequencing or real-time transmission. *Id.*

Petitioners argue that Carmel discloses maintaining fluidity because Carmel states that “the multimedia sequence is played back just as it was input at computer 34.” Pet., 36-37 (*quoting* EX1003 [Carmel], 10:48-54). But again, Carmel is discussing the multimedia being played back in the same *sequence* just as it was input, not *maintaining fluidity*. EX1003 [Carmel], 10:48-54 (“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.”). Indeed, the remainder of the sentence acknowledges playback will incur “a minimal necessary transmission and decoding delay” (EX1003 [Carmel], 10:48-54), which, again, is directed to real-time aspect of the transmission and playback, not to fluidity of the playback itself.. Petitioner’s assumption that playing back a sequence in real-time and in the order it was input is equivalent to maintaining fluidity is incorrect. Even after decoding with minimal delay, the process of rendering the video to display can stall, or be jittery and choppy if the device lacks, *e.g.*, sufficient memory, or processing power at the time, or experiences sudden hardware or software issues. EX2014 [Goldman Decl.], ¶106. Thus, maintaining fluidity is simply not disclosed in Carmel, as the quoted language therefrom and Petitioner’s arguments at best fail to teach fluidity and quality, and at worst serve as a straw man argument.

Similarly, Petitioner states that “Carmel generally teaches and repeatedly emphasizes seeking to match the bitrate/data rate of the multimedia slices with the available network bandwidth for download (and upload) so as to avoid lag and maintain fluidity.” Pet., 39-40. This misstates Carmel. Again, Carmel does not mention fluidity, let alone ***maintaining*** fluidity. While the portions of Carmel that Petitioner cites mention various aspects of transmitting, receiving and sequencing multimedia data, none of the citations Petitioner points to discuss maintaining fluidity. EX2014 [Goldman Decl.], ¶107. Petitioner quotes Carmel at 7:35-41 that discusses ensuring that “transmission or reception is ‘keeping up’ with the input of the data” (Pet., 40), but that passage is discussing transmission and reception, not playback, let alone maintaining fluidity during playback. That is, Carmel discusses matching the “data transmission or reception rate” with the rate broadcast data is being input to the transmitting computer. *Id.* Fluidity of playback on a mobile device is a different concept than matching transmission and reception rates with input rates. EX2014 [Goldman Decl.], ¶107.

To explain, Carmel is directed to “real-time broadcasting.” Exhibit 1004 [Carmel], Abstract. In Figure 2 (shown below) (which Carmel 7:35-41 refers to), video camera 22 captures video data and feeds that data to computer 34 at a certain rate. Because Carmel is discussing a real-time, or live, broadcast (for example, of “an entertainment or sports event” (*id.*, 6:58-59)), computer 34 must transmit the

video from the camera at a rate that is “keeping up” with the rate the camera is recording. *Id.*, 7:35-39. Likewise, clients 30 must be able to receive the data at a rate that keeps up with the rate the camera is recording. Otherwise, clients 30 cannot show the live event in real time. EX2014 [Goldman Decl.], ¶108; EX2015 [Polish Dep. Tr.], 60:18-23 (“what it sort of means for it to stream is that you're keeping up with it so that you don't have to fully download the video slower than realtime and then play it back.”).



But even if clients 30 can receive data at a rate that keeps up with the live broadcast, that does not ensure fluidity of playback at client 30. Real-time broadcasting is not a proxy for fluidity and quality. EX2014 [Goldman Decl.], ¶109; EX2029 [Welch], 2-3. Additional factors, like the availability of enough memory and processing power at client 30 to buffer and playback the video, or the capabilities of the multimedia player and decoder, will help determine whether the playback itself is fluid regardless of whether the video is broadcast real-time. EX2014 [Goldman Decl.], ¶109; EX1008 [FH], 582. Maintaining fluidity is simply not discussed or disclosed in Carmel. *Id.*

Because Carmel does not teach or suggest maintaining fluidity, Petitioner argues that background knowledge of a POSITA supplies this missing limitation, arguing that “maintaining playback fluidity/continuity and the highest possible or practicable audio and video playback ... was well-known and something that those in the field generally sought to achieve” and that “[a] POSA would have found it obvious and would have been motivated to achieve this fundamental streaming goal of maintaining fluidity and the highest possible/practicable quality multimedia playback. (*Id.*) Pet., 37.

Petitioner’s argument fails for several reasons.

First, Petitioner’s rationale is generic. High quality fluid playback is a general goal of any real-time system. EX2014 [Goldman Decl.], ¶110. But the hardware and

software on mobile devices available at the time lacked the ability to fluidly play high quality video and audio. *Id.* See EX2015 [Polish Dep. Tr.], 22:24-23:3 (“I’m not aware of any products that were around [in April 2005] that would [ ] stream video.”). Streaming capabilities on most mobile devices at the time were rudimentary or nonexistent. EX2014 [Goldman Decl.], ¶110; EX2015 [Polish Dep. Tr.], 23:11-21 (“there were constraints in all directions ... [mobile phones] were still very expensive ... there were also big limitations in power consumption...”). While a POSITA may have understood that maintaining fluidity, video quality and audio quality were desirable, a POSITA would not understand how to maintain fluidity, video quality, or audio quality in the claimed manner, especially given the limited capabilities of mobile devices at the time. *Id.* The ’849 Patent’s three claimed steps for maintaining fluidity, video quality and audio quality solved this problem. EX2014 [Goldman Decl.], ¶110.

Second, Petitioner’s rationale doesn’t explain how a POSITA would understand that fluidity should be maintained by performing the three claimed steps of (1) selecting a plurality of said multimedia objects that reflect available network bandwidth, (2) autonomously adjusting said selection and playback according to the multimedia object parameters and supplied host path identification, and (3) utilizing optimized decoding processes to maintain quality playback. Aside from the generic assertion that fluid playback is generally desirable, Petitioner provides no

explanation for why a POSITA would know to use the three claimed steps to maintain fluid playback. EX2014 [Goldman Decl.], ¶111. Thus, Petitioner's rationale is hindsight.

Petitioner relies on its expert declaration and extrinsic documents cited therein to support its gap filling. Pet., 37 (citing EX1002 [Polish Decl.], ¶178). None of the citations called out by Dr. Polish discuss fluidity. *Id.* Mostly, the citations discuss degradation of quality when there is limited bandwidth or computational power available. *Id.* But quality is only one factor that impacts maintaining fluidity. Fluidity is the smoothness of playback, regardless of whether any degradation of video or audio quality has occurred. EX2014 [Goldman Decl.], ¶112.

Third, this is not the sort of “unusually simple” limitation regarding “straightforward” technology that might be supplied by background knowledge of a POSITA. *Arendi* 832 F.3d at 1362. *See Supra*, §§II.A-C. The limitations here (maintaining fluidity, video quality and audio quality by performing the three claimed steps) are central to the claimed technology and involve complex and novel concepts relating to then-emerging ABR technologies. *Supra*, §II.C; EX2014 [Goldman Decl.], ¶114. Utilizing the three claimed steps was not at the time a standard method of maintaining fluidity that would have been common knowledge for a POSITA. *Id.* Indeed, a POSITA in April 2005 would not have known how to stream on a mobile device as mobile devices at the time did not stream. EX2014

[Goldman Decl.], ¶114; EX2015 [Polish Dep. Tr.], 22:24-23:3. Thus, this is not the sort of limitation that would be appropriate to supply with background knowledge to a POSITA.

Because Carmel does not teach or suggest maintaining fluidity as required by the independent claims, Petitioner cannot carry its burden to show that the claims are unpatentable by a preponderance of the evidence.

**3. Carmel And Mattavelli Do Not Teach Or Suggest “Fluidity, Video Quality and Audio Quality Are Maintained” In Accordance With The Claim Limitations.**

Claim 1.c.ii requires that “the multimedia player is configured to play multimedia objects in a sequence such that fluidity, video quality and audio quality are maintained by” performing all three distinct steps: (1) “selecting a plurality of said multimedia objects that reflect available network bandwidth,” (2) “autonomously adjusting said selection and playback according to the multimedia object parameters and supplied host path identification” and by (3) “utilizing optimized decoding processes to maintain quality playback.” EX1001 [’849 Patent], cl. 1. Each of these limitations must be taught or suggested in their entirety. That is, the alleged prior art must disclose or suggest that collectively performing each of these three steps maintains fluidity, video quality and audio quality. *Id.*

The Petition argues the limitation 1[c.ii] is purportedly taught by Carmel alone. Separately, the Petition argues that the third step (which the Petition termed

limitation 1[c.iv]) is purportedly taught by Mattavelli alone. *Compare* Pet., 35-40 with Petition, 45-50. But neither reference teaches either the third step alone or all three steps as required by the claim. At the outset, neither reference teaches utilizing optimized decoding processes to maintain fluidity, video quality and audio quality. EX2014 [Goldman Decl.], ¶117.

The Petition's reliance on Mattavelli's CGD video decoding as purportedly teaching "utilizing optimized decoding" and that the resulting degraded content teaches or suggests "maintaining the quality and fluidity of playback." (Pet., 48) is flawed. Even assuming *arguendo* that CGD video decoding were an optimized decoding process, Mattavelli stresses that CGD teaches degrading video quality, not maintaining fluidity, video quality and audio quality as required by the claims:

- "The goal [of CGD] is to provide results of possibly lower visual quality ... when the required processing needs exceed the available processing resources." EX1004 [Mattavelli], 2309;
- "The main rationale ... is to provide results of poorer quality when the results of the desirable quality cannot be obtained in real time." *Id.*;
- "When the complexity of the task exceeds the available processing power, real-time services, possibly of degraded quality, are nevertheless guaranteed respecting all real-time constraints." *Id.*;

- “In our case, the goal is to guarantee real-time video decoding with possible degradation of the image quality, i.e. reduction of the peak signal to noise ratio (PSNR), without losing [sic] parts of the image content.” *Id.*

**Degrading** video and audio quality is not the same as **maintaining** it. EX2014 [Goldman Decl.], ¶119. That is, the claims disclose three steps that operate together to maintain fluidity, video quality and audio quality during playback. Mattavelli discloses using degraded video/audio quality in response to system constraints. EX2014 [Goldman Decl.], ¶119.

These are fundamentally different disclosures with fundamentally different goals. Mattavelli teaches a decoding method with quality degradation when processing resources are constrained (EX1004 [Mattavelli], 2309); the '849 Patent claims disclose a decoding process that maintains fluidity and quality despite limitations of the processing device. EX1001 ['849 Patent], cl. 1. And 4:30-32; EX2014 [Goldman Decl.], ¶119.

Moreover, nothing in Mattavelli teaches or suggests using CGD to maintain fluidity. EX2014 [Goldman Decl.], ¶120. While the Petition includes attorney argument that Mattavelli's CGD decoding “ensure[s] that the fluidity or real-time continuity of the playback is maintained” (Pet. 46), nothing Petitioner cites from Mattavelli reflects maintaining fluidity. As with Carmel, the terms “fluid” and

“fluidity” are completely missing from Mattavelli. EX1004 [Mattavelli]. EX2014 [Goldman Decl.], ¶120.

The portions of Mattavelli Petitioner cites uniformly indicate that Mattavelli’s solution is to degrade service in response to limitations on processing power. Pet. 46 (*quoting* EX1004 [Mattavelli], 2309 and 2312.) These passages state “[t]he main rationale ... is to provide results of poorer quality when the results of the desirable quality cannot be obtained in real time” (*id.*, 2309) and, “[o]bviously, the implementation of CGD features are not proposed to be used at their maximum degradation rate but as [a] tool able 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” (*Id.*, 2312). It is evident from these quotes that Mattavelli is concerned with real-time, not fluidity. EX2014 [Goldman Decl.], ¶121.

Moreover, both quotes confirm that Mattavelli is intentionally degrading video quality rather than attempting to maintain fluidity, video quality and audio quality as required by the claims. Degrading is not maintaining video quality. Further, degraded service is also not maintaining fluidity; indeed, degraded service can often results in *lower* fluidity. EX2014 [Goldman Decl.], ¶122. As with Carmel, Mattavelli does not address maintaining fluidity.

**4. Mattavelli Does Not Teach Or Suggest “To Maintain Quality Playback” (limitation 1[c.iv])**

The Petition relies on Mattavelli alone for this limitation and the corresponding limitations of claims 6 and 7. Pet., 45-50, 65-67. The Petition argues that “Mattavelli teaches CGD methods where degraded, less computationally intensive algorithms and processes for decoding compressed multimedia data are used during periods where the decoding processing needs exceed the available processing resources, where the visual quality of the video output is possibly temporarily degraded to ensure that the fluidity or real-time continuity of the playback is maintained.” Pet., 46. As discussed above, Mattavelli’s CGD methods degrade visual quality of the video rather than maintaining it. *Supra*, §IV.B.

Moreover, Petitioner conflates real-time continuity of playback with maintaining playback quality. Pet., 46. The fact that playback is in real-time does not mean that playback quality is maintained. These are two different concepts. Real-time implies that playback happens without substantial delay. Maintaining quality playback in the claims relates to optimized decoding processes. EX1001 [’849 Patent], cl. 1. A real-time broadcast may still be choppy or freeze during playback. *Id.*; EX2014 [Goldman Decl.], ¶124; EX2029 [Welch], 2-3. For example, live sports broadcasts sometimes freeze or skip frames. In these cases, the broadcast may be real-time, but quality playback is not maintained. *Id.* Thus, Mattavelli’s disclosure

of real-time playback does not teach or suggest the claim limitation “to maintain quality playback.”

The Petition argues that “Mattavelli teaches that there are several decoding processes that can be simplified to save computational resources.” Pet., 47 (citing EX1003 [Mattavelli], 2309-2310. But Mattavelli describes these decoding processes as “possibly leading to imprecise or degraded video results.” EX1003 [Mattavelli], 2310. Mattavelli’s decoding processes do not disclose or suggest the decoding processes in a way that would maintain quality playback as required by the claims; instead, they degrade it.

**B. Carmel and Wang Do Not Teach Or Suggest The Challenged Claims (Ground 2)**

Ground 2 “incorporates Ground 1’s analysis of Carmel’s teachings and adds Wang’s teachings for claim elements 1[a.i], 1[b.ii], 1[c.iv] (and the corresponding elements recited in independent claims 6 and 7) and dependent claims 3, 4, 5, 8 and 9.” Pet., 70. Wang is not alleged to teach or suggest limitations 1[a.ii], 1[c.ii], 1[c.iii], or the corresponding limitations 6[a.ii], 6[c.ii], 7[a.ii] and 7[c.ii] in independent claims 6 and 7. *Id.* Those limitations are allegedly taught by Carmel and/or Mattavelli. *Id.*, 18-25. For the reasons discussed above (*supra*, §V.A), Carmel and/or Mattavelli do not teach or suggest these limitations. The Petition does not allege

Wang discloses these limitations. Pet., 70-75. Thus, Carmel in view of Wang also fails to teach or suggest these limitations. EX2014 [Goldman Decl.], ¶126.

Carmel and Wang also do not teach or suggest the challenged claims for the additional reasons discussed below.

**1. Carmel And Wang Do Not Teach Or Suggest “Utilizing Optimized Decoding Processes To Maintain Quality Playback.”**

The Petition alleges that Carmel in view of Wang teaches “utilizing optimized decoding processes to maintain quality playback.” (claim element 1[c.iv]) and the corresponding limitations in claims 6 and 7. *See* Pet. At 70, 72-73.

Petitioner’s argument that the Carmel-Wang combination discloses the “utilizing optimized decoding processes to maintain quality playback” is pasted below:

Wang teaches a “platform-based MPEG-4 Advanced Video Coding (AVC) decoder” that optimizes the decoding hardware and software so that resource-constrained mobile devices can decode MPEG-4 AVC encoded data fast enough to utilize this compression standard and benefit from the higher image quality it can provide. (Wang, 51.) Wang provides that to address constraints from “the low computation power and small memory for mobile devices” it adopts a “platform[-] based design method to increase overall throughput.” (*Id.*) Wang repeatedly states that its proposed decoder has “optimized” the decoding processes that it uses to achieve this goal of increased throughput/decoding speed

of the AVC codec. (*E.g.*, Wang 51 (“[W]e optimize the decoder software by enhancing the frame buffer management, boundary padding, and content aware inverse transform.”), 52 (describing “an optimized AVC decoder”), 53-54 (“Software Optimization” section 4.3).) Accordingly, Carmel in view of Wang teaches and renders obvious utilizing optimized decoding processes to maintain quality playback. (Polish, ¶¶279-281.)

Pet. at 72-73.

Petitioner does not contend that Carmel discloses “optimized decoding processes” that “maintain quality playback.” Rather, Petitioner relies on Wang alone for these elements. *Id.* at 70, 72-73.

The Petition’s argument fails for several reasons. Setting aside whether Wang’s platform-based decoder is an “optimized decoding process,” Wang does not disclose “utilizing optimized decoding processes to ***maintain quality playback.***” EX2014 [Goldman Decl.], ¶132. This is because Wang’s decoder is intended to improve throughput, not maintain quality playback. *See* Exhibit 1007 [Wang], 51 (“Overall decoding throughput is increased by synchronizing the software and the dedicated co-processors”); 51 (“platform [-] based design method ***to increase overall throughput***”); 53 (“To ... maximize the throughput ...”). Petitioner never contends that improving throughput is somehow equivalent to maintaining quality playback

and fails to provide any evidentiary support therefor. EX2014 [Goldman Decl.], ¶132.

The reason is simple: they are not equivalent. EX2014 [Goldman Decl.], ¶133. While improving throughput or decoding speed can help maintain quality playback, it does not automatically correlate to maintaining quality playback. Other factors, like processing power, multimedia player configuration, and decoding efficiency would also contribute. *Id.*; EX1008 [FH], 582. Moreover, the claims do not require improving throughput or decoding speed. Instead, the claims select “a plurality of said multimedia objects that reflect available network bandwidth” and then “utilize optimized decoding processes to maintain quality playback.” EX2014 [Goldman Decl.], ¶133. Because ground 2 fails to address this element, Petitioner cannot prove by a preponderance of the evidence that the claim is unpatentable.

Nor does Wang indicate that its platform-based decoder “maintain[s] quality playback.” Wang consistently explains that the decoder attempts to increase throughput. *See, e.g.*, EX1007 [Wang], 1 (“With this methodology, we jointly optimize the software and hardware design of the decoder. ***Overall decoding throughput is increased*** by synchronizing the software and the dedicated co-processors.”) (emphasis added), 1 (“With the new dedicated accelerators, ***the decoding throughput is increased*** by about 30% to reach 6.6 fps on the average and is up to 10.3 fps for slow motion video sequences.”) (emphasis added), 4 (“Fig. 7 (b)

shows the decoding throughput improvement”), 4 (“The application specific circuit design methodology includes the task partitioning and scheduling in the MB-level to *enhance the overall decoding throughput.*”). (emphasis added). The only time Wang even mentions “quality” is in the introduction in relation to MPEG-4 Advanced Video Coding (*see id.* at 1)—“quality” is never discussed in relation to Wang’s decoder, let alone that the decoder “maintains quality playback,” as claimed. EX2014 [Goldman Decl.], ¶134. Because Wang does not disclose “to maintain quality playback” and the Petition does not argue otherwise, ground 2 fails.

Moreover, even if Wang’s platform-based decoder could somehow be said to be an “optimized decoding process[] to maintain quality playback,” the Carmel-Wang combination still does not disclose all limitations of claim 1. As explained above, the “utilizing optimized decoding processes” limitation in claim 1 is one of three necessary operations controlled by the multimedia player “*such that fluidity, video quality and audio quality are maintained.*” *See supra*, §II.B. Thus, even if Wang’s platform-based decoder somehow meets the “optimized decoding processes to maintain quality playback” limitation, Wang’s decoder still must be used in the Carmel-Wang combination to maintain “fluidity, video quality and audio quality.” But as explained above, Wang’s decoder does not maintain video quality—it attempts to improve throughput and decoding speed. Moreover, Wang does not disclose audio decoding processes, so likewise does not maintain audio quality. Nor

does Wang discuss fluidity. Thus, the Carmel-Wang combination cannot meet the “fluidity, video quality and audio quality are maintained” limitation of claim 1. EX2014 [Goldman Decl.], ¶135.

The Petition’s argument for this limitation in ground fails to demonstrate a reasonable likelihood of invalidating any of the challenged claims. Carmel and Wang do not teach or suggest the “optimized decoding processes to maintain quality playback” limitation of claim 1. Petitioner does not argue Carmel teaches this limitation. And Wang’s platform-based decoder does not “utiliz[e] optimized decoding processes to maintain quality playback.” These deficiencies are fatal to Petitioner’s ground 2.

## **2. A POSITA would not have combined Carmel and Wang**

Petitioner’s ground 2 also fails for another reason—a POSITA would not have been motivated to combine the teachings of these references. EX2014 [Goldman Decl.], ¶137.

Carmel relates to systems for real-time multimedia broadcasting over a network. EX1003 [Carmel], 1:11-13. Carmel’s goal is to allow Internet service providers to provide “real-time broadcasting” “to their general clientele.” *Id.*, 1:43-47. According to Carmel, an object of the invention is to “provide substantially continuous, high-bandwidth data streaming over a network using common, existing server and network infrastructure.” *Id.* at 1:51-54. Clients in Carmel’s system

“preferably comprise conventional personal computers or workstations.” *Id.* at 6:38-40. Thus, Carmel seeks to implement media streaming over existing client hardware and software. EX2014 [Goldman Decl.], ¶138.

Wang does not seek to improve data streaming using existing infrastructure and conventional personal computers or workstations. Wang relates to a platform-based “prototype decoder” that relies on improved hardware and software. EX1007 [Wang], 1. Wang’s solution requires “jointly optimiz[ing] the software and hardware design of the decoder.” EX1007 [Wang], 1. It introduces a new “ARM platform-based MPEG-4 AVC decoder architecture.” EX 1007[Wang], 2. *See id.*, Fig. 2 (showing a block diagram of the proposed decoder architecture) That is, Wang is proposing a prototype hardware and software architecture that improves throughput. EX2014 [Goldman Decl.], ¶139.

Petitioner’s proposed Carmel-Wang combination is fundamentally incompatible with the teachings and goals of Carmel. EX2014 [Goldman Decl.], ¶140. A person of ordinary skill in the art would recognize that incorporating Wang’s hardware-dependent decoder into Carmel’s system would defeat one of the primary purposes of Carmel—namely, enabling seamless streaming to diverse client devices (*i.e.*, “**conventional** personal computers or workstations”). *Id.* *See, e.g., Deere & Co. v. David’s Dozer VLoc System, Inc.*, IPR2024-01442, Paper 10 at 28-30 (PTAB March 18, 2025) (holding a POSITA would not be motivated to combine references

where proposed combination rendered reference's system "inoperable for its intended purpose").

A POSITA would not modify Carmel's system for broadly compatible streaming over common infrastructure by requiring ISP's "general clientele" (*e.g.*, the general public) to obtain and install Wang's specific platform-based prototype decoder in order to receive streamed multimedia. EX2014 [Goldman Decl.], ¶141. Petitioner's assertion that Wang's "optimized decoding software and hardware design to decode AVC-encoded data" (Pet., 76) could simply be integrated into client devices in Carmel's system ignores the realities of what the references teach and the goals and purposes of each. Carmel is directed to a novel methodology for the *transmission* of real-time broadcasting. *See, e.g.*, EX1003 [Carmel], Abstract ("A method for real-time broadcasting from a transmitting computer to one or more client computers over a network..."), cl. 1 (same). Carmel does not and cannot control the devices that are used by clients to decode those transmissions. *Id.*, 6:38-40. Wang on the other hand is directed to an improved hardware and software decoder at the client devices. Implementing Wang's decoder in Carmel would require upgrading each client's personal computer or workstation to include the improved decoder hardware and software. That is, every customer of Carmel's Internet service provider would have to buy new hardware with Wang's prototype decoder architecture. EX2014 [Goldman Decl.], ¶141. The Petition's arguments thus

fail to articulate any reasoned basis why such a combination would have been desirable or obvious at the time of the invention.

Accordingly, because a POSITA would not have combined the teachings of Carmel and Wang, ground 2 of the Petition fails.

### **C. Grounds 3-5**

For the reasons described above (*supra*, §§V.A-B), grounds 1 and 2 fail to teach or suggest any of the independent claims. As discussed below, grounds 3-5 fail to remedy the deficiencies described above for grounds 1 and 2.

#### **1. Ground 3**

Ground 3 relies on Wolters (EX1041) to supply claim element 1[c.iv], which requires “utilizing optimized decoding processes.” Pet. 78. The Petition contends that Wolters’s discussion of High-Efficiency MPEG Advanced Audio Coding (“HE-AAC”) discloses such an optimized audio decoding process. *Id.* at 78–80. Wolters, however, expressly teaches that HE-AAC exists in two materially distinct variants, High-Quality (“HQ”) and Low-Power (“LP”), with opposing tradeoffs between audio quality and computational complexity. EX1041 [Wolters], 13. Neither variant satisfies the claims, nor does Wolters cure the deficiencies of Carmel and Wang. EX2014 [Goldman Decl.], ¶143.

Wolters explains that the HQ variant “offers better audio quality at the cost of greater computational complexity,” while the LP variant “results in a reduced audio

quality but also requires less computational resources for both memory and complexity.” EX1041 [Wolters], 13. These distinctions are fatal to the Petition’s theory. EX2014 [Goldman Decl.], ¶144.

First, the Petition does not explain how HE-AAC LP could maintain audio quality, as expressly required by the claims. *See* Pet. 78–80. To the contrary, Wolters states that the LP variant reduces audio quality. EX1041 [Wolters], 13. Nor does the Petition identify anything in Wolters that addresses maintaining fluidity or video quality, both of which are also required by claim element 1[c]. Accordingly, adding Wolters in Ground 3 does not remedy the same failure present in Ground 2, namely the absence of any disclosure that “fluidity, video quality, and audio quality are maintained by ... utilizing optimized decoding processes to maintain quality playback.” *See supra* §V.B. Because Wolters expressly teaches a reduction in audio quality under its low-power mode, it affirmatively contradicts, rather than satisfies, the claim requirement. EX2014 [Goldman Decl.], ¶145.

Second, a person of ordinary skill in the art (“POSITA”) in April 2005 would not have implemented HE-AAC HQ in the mobile context addressed by the ’849 Patent. Wolters makes clear that the HQ variant achieves higher audio quality only by incurring “greater computational complexity.” EX1041 [Wolters], 13. That teaching is incompatible with the ’849 Patent’s core premise and repeated disclosures concerning the severe processing constraints of mobile devices. *See, e.g.,*

EX1001 ['849 Patent], 1:51–52 (noting that “audio codecs like AAC require multiple parallel processes and fast processing”); 2:13–15 (explaining that although Java decoders existed for MP3 ringtones, “no Java players are known that will play AAC”); 4:50–54 (stating that Java “cannot take advantage of hardware capabilities in processing the huge number of calculations and variables required for either MPEG4 decoding or AAC decoding on limited processing mobile handset”). *See* EX2014 [Goldman Decl.], ¶146.

Wolters reinforces this incompatibility. EX2014 [Goldman Decl.], ¶147. It explains that HE-AAC HQ decoding relies on “a complex representation of the subband samples” with computations performed using complex values (EX1041 [Wolters], 6) and further requires portions of the decoder to be implemented using double-precision arithmetic. *Id.* at 13. The '849 Patent, by contrast, expressly observes that typical mobile processors “have integer math only,” underscoring the absence of hardware support for such operations in the relevant time frame. Ex. 1001 ['849 Patent], 10:26-28. As Dr. Goldman explains, HE-AAC therefore demands substantially more processing power than MPEG-4 Audio in a manner inconsistent with mobile streaming systems of the era. EX2014 [Goldman Decl.] ¶147.

In short, Wolters is not a suitable reference for claim element 1[c.iv]. Its LP variant fails to maintain audio quality, while its HQ variant requires computational resources that the '849 Patent expressly identifies as unavailable on mobile devices.

EX2014 [Goldman Decl.] ¶148. Because HE-AAC is incompatible with the mobile decoding constraints that define the claimed invention, a POSITA would not have combined Wolters with Carmel and Wang. Ground 3 therefore fails for the same reasons as Ground 2 and should be denied.

## **2. Grounds 4 and 5**

The Petition relies on quaternary reference Guo [EX1051] in ground 4 and 5 for its alleged teachings regarding “the use of multiple servers to serve multimedia segments” (claim element 1[b.ii]). Pet., 80, 86. The Petition relies on quinary reference Yu [EX1061] in grounds 4 and 5 for dependent claims 3 and 8. *Id.* The Petition relies on quinary reference Forecast [EX1016] in grounds 4 and 5 for dependent claims 4 and 5. None of these additions remedy the failure of Carmel, Mattavelli and Wang to teach or suggest the independent claims as discussed above for grounds 1 and 2. *Supra*, §V.A, B, C.2. Thus, grounds 4 and 5 also fail. EX2014 [Goldman Decl.], ¶149.

## **1. Petitioner Fails To Provide Rationales For Combining The Hypothetical System In Grounds 4 and 5**

The Petition also fails to provide a rationale for combining Guo, Yu and Forecast in grounds 4 and 5 with each other or the combined system of Carmel and Mattavelli in ground 1 (for ground 5) or the combined system of Carmel, Wang and Wolters in ground 3 (for ground 4). Pet., 80-86. Instead, the Petition simply argues

that a POSITA would have individually combined Guo, Yu and Forecast with Carmel. 82-83 (“Carmel teachings in view of Guo’s render such an arrangement obvious.”); 84 (“A POSA would have been motivated to combine Yu’s teachings with the system taught by Carmel...”); 85 (“A POSA would have found it obvious to combine the teachings of Carmel and Forecast...”).

But the Petition is not attempting to combine these references with Carmel alone. Guo is being combined with the system allegedly resulting from Carmel in view of Wang and Wolters for ground 4. Pet., 80. Guo is being combined with the system allegedly resulting from Carmel in view of Mattavelli (for ground 5). Pet., 86. Yu and Forecast are being combined with the system allegedly resulting from Carmel in view of Wang, Wolters and Guo (ground 4) and the system allegedly resulting from Carmel in view of Mattavelli and Guo (ground 5). *Id.* For ground 5, Petitioner states only “a POSA would have been motivated to combine their teachings [i.e., Guo, Yu and Forecast] with Carmel’s (and Mattavelli’s) for the reasons provided above in Ground 4.” Pet., 86. But Mattavelli is not even part of ground 4. Pet., 80.

Nor is Petitioner’s failure harmless. For example, in ground 2, Petitioner combines Wang with Carmel for limitation 1[b.ii]. Pet., 70. Petitioner alleges both Wang and Carmel separately teach this limitation. Pet., 71-72. But then in ground 4, Petitioner adds Guo for limitation 1[b.ii]. Petitioner provides no explanation for why

a POSITA having already alleged this limitation is disclosed by Carmel and Wang would think to add a third reference, or how the addition of Guo would impact Wang's additions. Pet., 80. The incorporation of Guo is pure hindsight.

Petitioner's failure to provide rationales for combining Guo, Yu and Forecast with the hypothetical system they are being combined with dooms grounds 4 and 5. *Virtek Vision Int'l ULC v. Assembly Guidance Sys., Inc.*, 97 F.4th 882, 887 (Fed. Cir. 2024) ("there must exist a motivation to combine various prior art references in order for a skilled artisan to make the claimed invention."). Accordingly, grounds 4 and 5 fail.

**D. The Petition Fails Under 37 C.F.R. § 42.104(b)(3)**

37 C.F.R. § 42.104(b)(3) provides the non-discretionary requirement that "the petition must set forth ... a statement of precise relief requested" including "How the challenged claim is to be construed." *Id.* The Petition states that, "[f]or purposes of this petition, Petitioner does not presently contend that any term requires express construction." Pet, 6. *See also* EX1002 [Polish Decl.] ¶29, EX2015 [Polish Dep. Tr.], ('26:16-18 ("I'm just using plain and ordinary meaning" for all claim terms). In the copending litigation, however, Petitioner proposed the claim terms "optimal," "optimal digital format," "optimal encoding rate," "optimized decoding process," "fluidity," "video quality and audio quality are maintained," and "maintain quality playback" are indefinite. EX2013 [Joint Claim Construction Statement], at 6-12.

“[W]hen a petitioner advances different positions before the Board and a district court, that petitioner is required to explain why those different positions are warranted.” *Tesla, Inc. v. Intellectual Ventures II LLC*, IPR2025-00340, Paper 18 at 4 (Director Nov. 5, 2025) (informative). *See also Revvo Techs., Inc. v. Cerebrum Sensor Techs., Inc.*, IPR2025 00632, Paper 20 at 3–5 (Director Nov. 3, 2025) (precedential) (explaining the Office’s approach to addressing a petitioner’s different claim construction positions in two forums). Despite submitting its proposed indefiniteness constructions over six months ago, Petitioner has provided no explanation for why it advances different positions before the Board and district court. *See* 37 C.F.R. § 42.104(b)(3). This “fails to further, but instead detracts from, the Office’s goal of ‘providing greater predictability and certainty in the patent system.’” *Tesla*, IPR2025-00340, Paper 18 at 4 (quoting *Revvo Techs.*, IPR2025-00632, Paper 20 at 4–5.) Consistent with this goal, the Board must reject Petitioner’s attempt to advance inconsistent claim constructions and hold the challenged claims patentable.

**E. “To Maintain Quality Playback” In Claims 1 And 6 Is Not An Intended Use**

**1. “To Maintain Quality Playback” Is Not An Intended Use**

The Decision on Institution states that “the phrase ‘to maintain quality playback might be considered’ a statement of intended purpose or use in claims 1

and 6. D.I., 25. Statements of intended use typically appear in the claim preamble. *In re Stencel*, 828 F.2d 751, 754 (Fed. Cir. 1987) (“Such statements often, although not necessarily, appear in the claim’s preamble, as in *Stencel*’s claims.”). “To maintain quality playback” appears in the final limitation of claims 1 and 6, not the preamble. EX1001 [’849 Patent], cls. 1, 6.

“[O]nly those terms need be construed that are in controversy, and only to the extent necessary to resolve the controversy.” *Vivid Techs., Inc. v. Am. Sci. & Eng’g, Inc.*, 200 F.3d 795, 803 (Fed. Cir. 1999). Moreover, “[i]t is highly disfavored to construe terms in a way that renders them void, meaningless, or superfluous.” *Intel Corp. v. Qualcomm Inc.*, 21 F.4th 801, 810 (Fed. Cir. 2021)

Neither party has argued in this IPR that “to maintain quality playback” needs construed, let alone that “to maintain quality playback” is an intended use. Pet., 6, 45-46 n. 8; 35 U.S.C. §312(a)(3). Thus, the Board need not construe the term. Further, as discussed below, “to maintain quality playback” is not an intended use.

**a. “To maintain quality playback” is structural**

When a patentee “uses the claim preamble to recite structural limitations of his claimed invention, the PTO and courts give effect to that usage.” The limitation “to maintain quality playback” is structural. *Rowe v. Dror*, 112 F.3d 473, 478 (Fed.Cir.1997) (holding “the PTO and courts give effect” to structural limitations). It modifies “utilizing optimized decoding processes.” EX1001 [’849 Patent], cls. 1,

6, 7. Thus, it is narrowing the term “optimized decoding processes” to those decoding processes that optimize maintain quality playback. EX2014 [Goldman Decl.], ¶¶81-82.

“Optimized” in the context of “decoding processes” within the ’849 Patent means complexity reducing operations. EX2013 [Joint CC Statement], 7 (“optimized decoding processes” : “complexity reducing decoding processes”); *see also* EX2031 [Chen], 45 (describing the need for complexity reducing methods to decode the for computationally complex H.264 standard). Thus, the limitation “to maintain quality playback” specifies that quality playback is maintained by using complexity reducing decoding processes. EX2014 [Goldman Decl.], ¶82. Without the structural element in question, this claim element would simply require utilizing optimized decoding processes, but to what end? Optimized (complexity reducing) decoding processes could reasonably increase playback pixelation as means to lessen data throughput. The patentee, however, selected a different path: the maintenance of “quality playback,” which restrains the types of decoding used.

“To maintain quality playback” also modifies, and refers back to, the earlier limitation “wherein the multimedia player is configured to play multimedia objects in a sequence such that fluidity, video quality and audio quality are maintained.” EX1001 [’849 Patent], cl. 1; EX2014 [Goldman Decl.], ¶83.

This is consistent with the term’s use in the specification. EX2014 [Goldman Decl.], ¶84. The specification explains that the term “maintain” indicates that attempting to ensure that certain condition(s) or state(s) would continue. *See, e.g.*, EX1001 [’849 Patent], 3:24-26 (“To minimize delays that will occur to *maintain* synchronicity between the client and server, a larger multimedia object window can be dynamically created on the host server.”); 7:35-37 (“To reduce delays that will occur to *maintain* synchronicity between the client 8 and server 1 or 7, a larger multimedia object window can be used.”); 13:64-67 (“On very limited devices short-cuts in the decoding process must be made to allow the device to *maintain* synchronicity between the audio and video playback.”) (emphasis added in each).

With respect to the term “quality,” the specification teaches that, in certain embodiments, different levels of quality may be maintained based on the processing power of the mobile device itself. *See* EX1001 [’849 Patent], 13:60-14:15. “This mechanism allows video coding to scale in complexity based on the processing power of the device being used.” *Id.*, 14:3-5. “On very limited devices, short-cuts in the decoding process must be made to allow the device to maintain synchronicity between the audio and video playback.” *Id.*, 13:64-67. *See* EX2014 [Goldman Decl.], ¶85.

Accordingly, “to maintain quality playback” is not an intended use because it provides necessary structure to the limitations.

**b. “To maintain quality playback” was relied on during prosecution to distinguish the invention from the prior art**

In analogous cases involving preambles, the Federal Circuit has held “clear reliance on the preamble during prosecution to distinguish the claimed invention from the prior art transforms the preamble into a claim limitation because such reliance indicates use of the preamble to define, in part, the claimed invention.” *Catalina Mktg. Int’l, Inc. v. Coolsavings.com, Inc.*, 289 F.3d 801, 808 (Fed. Cir. 2002). Although the limitation “to maintain quality playback” is not in the preamble, the Applicant here clearly relied on “maintain quality playback” to distinguish the claimed invention over the prior art. Notably, the prior art of record during prosecution included Carmel, the primary reference in this IPR.

In a November 5, 2018 Response to an office action, the Applicant distinguished the Vetro reference because it did not disclose “maintaining [] quality playback” as required by the claims:

Maintaining semantic fidelity and further compression are NOT the same as optimized player decoding. Semantic fidelity is based on extracted bitstream characteristics for encoding and transmission control by using the Vetro predictor model and transcoder to adaptively adjust the bitstream for network bandwidth and to tailor it to operational player characteristics/limitations. Maintaining smooth quality playback, based on playback efficiency in my specification, involves other factors, and involves dynamic player executed configurations and optimized decoding, based on the parsed multimedia objects.

EX1008 [FH], 582. Thus, the Applicant distinguishes “maintaining smooth quality playback” from prior art that taught “maintaining semantic fidelity.” EX2014 [Goldman Decl.], ¶¶87-88 Because the limitation “maintaining [] quality playback” was clearly relied upon to distinguish over the prior art of record, it is limiting. *Catalina*, 289 F.3d at 808.

For the reasons discussed above, “to maintain quality playback” is not an intended use.

## **2. “To Maintain Quality Playback” In Claim 7 Is Not An Intended Use**

For all of the reasons discussed above (*supra*, §V.E.1), claim 7 is not an intended use. In addition, as the Decision on Institution noted, “the recitation of ‘to maintain quality playback’ in claim 7 does not appear to be a statement of intended use because this claim recites ‘configured to.’” Pet., 26 (citing *In re Giannelli*, 739 F.3d 1375, 1378–80 (Fed. Cir. 2014) (recited elements of an apparatus “adapted to” or “configured to” perform a function have a narrower meaning than merely an intended use of the elements themselves). Thus, for this additional reason, “to maintain quality playback” is not an intended use in claim 7.

## **3. There Is No Claim Differentiation Argument**

The Decision on Institution “invite[d] the parties to brief whether claim 7’s ‘configured to’ language creates a presumption that claims 1 and 6 recite intended

purpose and intended use language, respectively.” D.I., 26 n. 10. Claim 7’s language does not create a presumption that claims 1 and 6 are an intended purpose or use. As discussed above, “to maintain quality playback” is not an intended use in any claim of the ’849 Patent. *Supra*, §V.E.1.

Further, the language of the claims does not support a claim differentiation argument. “Because claim terms are normally used consistently throughout the patent, the usage of a term in one claim can often illuminate the meaning of the same term in other claims.” *Phillips v. AWH Corp.*, 415 F.3d 1303, 1314 (Fed. Cir. 2005) (internal quotations omitted). “Differences among claims can also be a useful guide in understanding the meaning of particular claim terms.” *Id.* “For example, the presence of a dependent claim that adds a particular limitation gives rise to a presumption that the limitation in question is not present in the independent claim.” *Id.* at 1315.

Here, the Board’s question is directed to different independent claims, rather than a dependent claim and underlying independent claim. Thus, there is no presumption that “to maintain quality playback” is used differently between the independent claims. *Phillips*, 415 F.3d at 1314.

The relevant language in Claim 1 is substantially similar to claim 7. Pet., 66 (“claim 7 is materially the same as claim 1 except that it is written as a system for performing a method instead of a method.”). Claim 1 requires “*the multimedia*

*player is configured to* play multimedia objects in a sequence such that fluidity , video quality and audio quality are maintained by ... utilizing optimized decoding processes to maintain quality playback.” EX1001 [’849 Patent], cl. 1 (emphasis added). This language is nearly identical to the language of claim 7 and uses “multimedia player is configured to.” Thus, claim 1 “does not appear to be a statement of intended use.” D.I. 26. *Compare* cl. 7 *with* cl. 1. *See* EX2014 [Goldman Decl.], ¶90.

Claim 6’s language is slightly different because claim 6 is directed to computer executable instructions, but is otherwise materially the same as claims 1 and 7. Pet., 65 (“claim 6 is materially the same as claim 1 except that it is written as a claim to a device (*i.e.*, multimedia player) that includes computer executable instructions for performing a method instead of a method.”).

The minor differences in the language of claim 6 does not convert “to maintain quality playback” into an intended use. Claim 6 requires “[a] multimedia player comprising: computer executable instructions stored on a non-transitory computer readable medium which when executed by a processor ... plays back received multimedia objects in a sequence such that fluidity, video quality and audio quality are maintained by ... utilizing optimized decoding processes to maintain quality playback.: EX1001 [’849 Patent], cl. 6. While claim 6’s preamble does state “a multimedia player *comprising*” (emphasis added), the later “computer executable

instructions” limitation narrows the comprising language. *Id.* The computer executable instructions, when executed by a processor, **must** perform the claimed software steps, including “utilize optimized decoding processes to maintain quality playback.” EX1001 [’849 Patent], cl. 6 (“computer executable instructions ... which when executed by a processor ... plays back received multimedia objects in a sequence such that fluidity, video quality and audio quality are maintained ... by utilizing optimized decoding processes to maintain quality playback.”). “To maintain quality playback” is not a goal or aspirational statement that modifies “comprising,” it is required by the plain language of claim 6. *Id.* See EX2014 [Goldman Decl.], ¶¶91-93.

Thus, claim differentiation is not applicable in this instance. Each claim requires that the method or system must perform the entire limitation of “utilizing optimized decoding processes to maintain quality playback.”

## VI. CONCLUSION

The Petition fails to establish by a preponderance of the evidence that the Challenged Claims are unpatentable. Accordingly, the Board should find claims 1-9 of the ’849 Patent patentable.

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Respectfully submitted,

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**CERTIFICATE OF COMPLIANCE**

The undersigned certifies that this Patent Owner Response complies with the type-volume limitations of 37 C.F.R. §42.24 because it contains 13,664 words (as determined by the Microsoft Word word-processing system used to prepare the Petition), excluding the parts exempted by 37 C.F.R. §42.24.

Dated: January 23, 2026

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**CERTIFICATE OF SERVICE**

The undersigned certifies that the foregoing **PATENT OWNER RESPONSE** and accompanying exhibits were served on the date below via email at the following email addresses:

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