

UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE PATENT TRIAL AND APPEAL BOARD

fuboTV MEDIA INC. and YANKA INDUSTRIES, INC.,
Petitioners,

V.

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

IPR2024-00918

U.S. PATENT NO. 9,407,564

PATENT OWNER'S RESPONSE

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PATENT OWNER'S EXHIBIT LIST

Ex. No.	Description of Document
2001	U.S. Patent App. Pub. No. 2004/0030547 by Leaning et al. (“Leaning US”)
2002	Redline Comparison of Leaning and Leaning US
2003	Reserved
2004	Reserved
2005	Information Disclosure Statement entered in prosecution of U.S. Patent App. No. 18/069,450
2006	Notice of Allowance entered in prosecution of U.S. Patent App. No. 18/069,450
2007	337-TA-1265 ITC Investigation Commission Opinion
2008	Reserved
2009	<i>DISH Techs. L.L.C. v. MG Premium Ltd</i> , 2:23-cv-00552, Dkt. 114 (D. Utah Aug. 15, 2024)
2010	USPTO Reexamination Operational Statistics (Updated June 2024)
2011	Dave Marshall, <i>Compression: Video Compression (MPEG and others)</i> , Cardiff University, http://users.cs.cf.ac.uk/Dave.Marshall/Multimedia_CM0340/PDF/11_CM0340_MPEG_Video.pdf
2012	ITU-T Recommendation H.261 1993
2013	ISO/IEC 11172-2:1993(en), Information technology — Coding of moving pictures and associated audio for digital storage media at up to about 1,5 Mbit/s — Part 2: Video
2014	U.S. Patent No. 6,002,440 (’440 Patent)
2015	ISO/IEC 11172-3:1993(en), Information technology — Coding of moving pictures and associated audio for digital storage media at up to about 1,5 Mbit/s — Part 3: Audio
2016	NPB-P16992EP-O1-Letter from opponent
2017	US6806909
2018	Peloton ABR.mp4
2019	HTTP The Definitive Guide - Chapter 4
2020	Declaration of Inventor Robert Drew Major
2021	MOVE Networks Streaming Media Technology
2022	MOVE Networks Technology Overview
2023	Sling TV Emmy Award (CX-1084)
2024	MOVE Awarded Fundamental Patent (CX-1122)
2025	MOVE Networks Article (CX-0013)

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2026	OnHollywood 100 (CX-1078)
2027	OnHollywood 100 Winner (CX-1079)
2028	OnMedia 100 Winner (CX-1080)
2029	Red Herring Global 100 (CX-1081)
2030	MOVE Networks TechCrunchies Finalist (CX-1082)
2031	MOVE Networks Makes Web TV Watchable (CX-0046)
2032	ABC.com Makes Watching TV at Work Better (CX-1106)
2033	MOVE Networks, a next-gen content distribution platform (CX1134)
2034	Better than YouTube (CX-0045)
2035	Long-Form Video Gaining Viewers (CX-1115)
2036	Move Over Joost (CX-1125)
2037	Coming Faster Than You Think (CX-1110)
2038	WSJ Pushing to Bring TV to the Internet (CX-1128)
2039	CNN Level 3 Collaborates with MOVE (CX-1113)
2040	The Sport Page ESPN 360 (CX-1132)
2041	E-Mail 5/15/2007 (CX-1047C)
2042	E-Mail 6/16/2007 (CX-1049C)
2043	E-Mail 11/26/2007 (CX-1050C)
2044	ABC Big Move Away from Flash (CX-1116)
2045	Disney ABC Throws Down (CX-1130)
2046	The Lowdown on Apple (CX-1131)
2047	AOL and CBS Put Online HD (CX-1109)
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2049	ABC Becomes First Network HD Streamer (CX-1112)
2050	ABC.com to Stream HD Video (CX-1108)
2051	ABC Adds Full Screen Mode to Online Shows (CX-1104)
2052	MOVE Networks Releases Live Streaming (CX-1123)
2053	ABC Offering Full Screen Streaming HD (CX-1105)
2054	Level 3 Streams and Other News from SMW (CX-1114)
2055	Microsoft Unlocks Power of the Web (CX-1092)
2056	Reserved
2057	Disney Backs Video Start-Up (CX-1111)
2058	Here Comes More HD Video (CX-1077)
2059	E-Mail 1/20/2009 (CX-1146C)
2060	MOVE and Microsoft Term Sheet (CX-1051C)
2061	To the Ends of the Earth (CX-1074)

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2062	MOVE Gets Streaming Patent; Are Adobe & Apple Hosed? (CX1120)
2063	DISH's Motion for Preliminary Injunction, <i>DISH Techs. v. MG Premium Ltd et al.</i> , No. 2:23-cv-552-HCN-DAO, D.I. 19.
2064	Official Report of the One Hundred Seventy-fifth Semiannual General Conference, The Church of Jesus Christ of Latter-day Saints (Oct. 1, 2, 2005).
2065	Apple and MOVE NDA Agreement 11/15/2006 (CX-1137C)
2066	Apple and MOVE NDA Agreement (CX-1085C)
2067	E-Mail on 2/23/2009 (CX-1219C)
2068	Microsoft Invests in Net Video (CX-1087)
2069	MOVE Networks Publishing System (CX-1247C)
2070	Silverlight Shines (CX-1090)
2071	Exemplary Claim Chart Illustrating MOVE Networks' Use of Invention
2072	Reserved
2073	Excerpt of Deposition of David Ericson in <i>In re Certain Fitness Devices, Streaming Components Thereof, and Systems Containing Same</i> , Inv. No. 337-TA-1265 (taken Jan. 6, 2022)
2074	MOVE Crosses the Hour Threshold
2075	Readies Online HD Shows as Streamlettes (CX-1107)
2076	Delivering a Better Viewing Experience
2077	MOVE Adaptive Stream
2078	Utah Valley Entrepreneurial Forum Hall of Fame 2013
2079	Utah Technology Hall of Fame 2005
2080	ABC TV New Player Rocks
2081	E-Mail 1/23/2008 (CX-1052C)
2082	ABC.com Streamlettes (CX-1133)
2083	MOVE Networks Newsroom (CX-1124)
2084	ABC.com Readies Online HD (CX-1135)
2085	Metrics Point to Maturation of Online (CX-1117)
2086	More Money Pouring Into Rich Media (CX-1118)
2087	MOVE Put Mass Back Into Mass Media (CX-1126)
2088	E-mail 2/25/2008 (CX-1053C)
2089	E-mail 5/14/2008 (CX-1055C)
2090	2010 EchoStar 10-K (CX-0052)
2091	E-Mail 8/26/2008 (CX-1059C)
2092	Microsoft Extends Vision (CX-1148)

Ex. No.	Description of Document
2093	DISH's Motion to Terminate Against Peloton
2094	Joint Motion to Partially Terminate Against Mirror
2095	DISH Petition to Rescind Limited Exclusion Order Against iFit
2096	MOVE Networks Awarded Fundamental Patent (CX-1091)
2097	Reserved
2098	Default Protective Order
2099	Declaration of Gregory Smith
2100	Declaration of David Ericson
2101	Supplemental Declaration of David Ericson in <i>Aylo Freesites Ltd v. DISH Technologies L.L.C.</i> , IPR Nos. 2024-00043, -00044, -00045, -00046, -00146.
2102	Transcript of Deposition of David Ericson in <i>Aylo Freesites Ltd v. DISH Technologies L.L.C.</i> , IPR Nos. 2024-00043, -00044, -00045, -00046, -00146 (taken Sept. 19, 2024)
2103	Baseball Tests Online Broadcasts, NY Times (CX-1151)
2104	E-Mail 5/12/2007 (CX-1218C)
2105	E-Mail 5/25/2007 (CX-1198C)
2106	Reserved
2107	E-Mail 7/25/2008 (CX-1101C)
2108	E-Mail 6/2/2008 (CX-1056C)
2109	E-Mail 2/22/2008 (CX-1054C)
2110	E-Mail 7/22/2008 (CX-1057C)
2111	Reserved
2112	Video Support (CX-0103)
2113	Microsoft Announces New Support for Silverlight (CX-1093)
2114	Move Networks Powers Seven of Top Ten Online Broadcast TV Networks (CX-1201C)
2115	Reserved
2116	E-Mail 2/2/2009 (CX-1196C)
2117	E-Mail 2/13/2009 (CX-1197C)
2118	E-Mail 6/14/2007 (CX-1199C)
2119	E-Mail 4/21/2008 (CX-1200C)
2120	Display Commemorating BYU.tv Launch Using Move ABR Technology
2121	Fox Switches (Ericson Dep. Exhibit 1)
2122	Delivering a Better Viewing Experience (CX-1102)
2123	Declaration of MOVE President and CEO John Edwards

Ex. No.	Description of Document
2124	Deposition Testimony of John Edwards in <i>In re Certain Fitness Devices, Streaming Components Thereof, and Systems Containing Same</i> , Inv. No. 337-TA-1265 (taken Nov. 12, 2021)
2125	Declaration of E. Flaucher of Microsoft in <i>In re Certain Fitness Devices, Streaming Components Thereof, and Systems Containing Same</i> , Inv. No. 337-TA-1265
2126	Declaration of Peter Ratcliffe
2127	Declaration of Mark Mitchell
2128	Deposition Testimony of Mark Mitchell in <i>In re Certain Fitness Devices, Streaming Components Thereof, and Systems Containing Same</i> , Inv. No. 337-TA-1265 (taken December 02, 2021)
2129	Transcript of Deposition of Dr. Houh (February 6, 2025)
2130	Level 3 and Move 6.22.07 (CX-1071C)
2131	Request for Comments 8216, “HTTP Live Streaming,” Pantos & May (2017 ed.)
2132	Deposition Testimony of Greg Smith in <i>In re Certain Fitness Devices, Streaming Components Thereof, and Systems Containing Same</i> , Inv. No. 337-TA-1265 (taken Nov. 09, 2021)
2133	Leaning Demonstrative.mp4
2134	<i>Aylo Freesites Ltd v. DISH Technologies L.L.C.</i> , IPR2024-00940, Paper 1 (Petition 1 of 2).
2135	segment_cif_001.h261.mp4
2136	akiyo_cif_full.y4m.mp4
2137	Request for Comments 2068, “Hypertext Transfer Protocol – HTTP/1.1,” Fielding et al. (Jan. 1997)
2138	Request for Comments 2616, “Hypertext Transfer Protocol – HTTP/1.1,” Fielding et al. (June 1999)
2139	U.S. Patent No. 6,678,332 (Gardere et al.)
2140	BT turns on to TV, The Register (Nov. 2, 2001).
2141	Declaration of Dr. Kevin Jeffay
2142	Echostar Acquires MOVE Networks

I. INTRODUCTION

Every petitioner in an *inter partes* review (“IPR”) bears the burden of demonstrating unpatentability by a preponderance of the evidence based on the theories disclosed in the petition. Petitioner fails to meet that standard here.

Patent Owner (“PO”) acquired the company MOVE Networks, Inc. (“MOVE”), including the challenged patents, as part of PO’s efforts to develop and launch the Sling TV streaming services. MOVE developed the adaptive-bitrate (“ABR”) technology of the challenged claims, revolutionizing how content is delivered and experienced over the Internet by allowing user’s devices, e.g., smartphones, to dynamically adjust between different quality levels to achieve continuous playback of video content. Industry leaders like Microsoft, ESPN, and Level 3 praised MOVE’s contribution to Internet video streaming, tying it specifically to MOVE’s patented ABR technology.¹ Petitioner gives short shrift to the voluminous objective evidence of non-obviousness, despite this being one of the four requisite tenets of any *Graham v. John Deere* obviousness analysis.

This analysis is particularly relevant here, where Petitioner’s only challenges are under 35 U.S.C. §103, combining the Leaning reference (EX1004) with the skill of a POSITA or a secondary reference to assert invalidity of the claims. As Petitioner

¹ Herein, Section IV details how multiple categories of objective indicia establish the non-obviousness of the challenged claims.

admits, Leaning fails to *disclose* each and every limitation of those claims. Indeed, this proceeding is one of four related IPR proceedings² (the “Leaning IPR’s”) challenging a total of 75 claims relating to the same ABR technology. And none of the Leaning IPR petitions rely on 35 U.S.C. § 102 as a basis for invalidity. Each petition was therefore required to demonstrate how and why a POSITA would have modified Leaning to arrive at each missing limitation with a reasonable expectation of success, and to address objective indicia of nonobviousness arising from the success of PO’s video streaming service. But the petitions lack any meaningful analysis of the objective indicia.

All the Challenged Claims subject to the objective evidence of non-obviousness analysis here require shifting between a plurality of streams “to achieve continuous playback.” Petitioner fails to address this “continuous playback” limitation. Despite failing to address this limitation, the portions of Leaning that Petitioner does rely on disclose that, whenever there is a shift in playback quality, the system must “clear” the content player’s buffer and wait for it to refill before resuming playback. E.g., EX1004, 10. But waiting for a buffer to refill before resuming playback does not meet the “continuous playback” limitation. Instead, it is associated with the well-known technique known as “progressive downloading,”

² IPR2024-00940, IPR2024-00917, IPR2024-00918, and IPR2024-00919 assert Leaning (EX1004) as the primary reference and are set on a consolidated schedule.

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which was disclosed in the Background section of the Challenged Patent. EX1001, 1:62-2:5. And that technique is disparaged, and distinguished over, by the Challenged Patent because of its intrinsic delays. *Id.*, 2:39-48. By contrast, Leaning lauds the benefits of clearing its buffer and interrupting playback. Petitioner ignores that the Challenged Patent specifies avoiding the exact type of delay inherent in prior art buffering techniques like Leaning's. Far from addressing Leaning's deficiencies and articulating obviousness theories to address them, the Petition expressly relies on Leaning's disclosures that teach away from "continuous playback."

Petitioner also attempts to downplay the fact that it relies on Leaning's audio-related disclosures when addressing claimed "video" limitations. This disparity proves fatal to Petitioner's grounds because, as Leaning emphasizes, the techniques required to deliver video are "more complex" with "further implications" than audio. EX1004, 16:17-21. By ignoring these complexities and implications—some of which cause additional disruptions in playback—Petitioner fails to carry its burden of showing that **any** of the teachings it relies on are applicable to video in the first instance, much less that they disclose "continuous playback" when rate switching.

Petitioner also falls short of meeting its burden on several other claim limitations, including use of multiple TCP connections, initially requesting "low quality files to enable instant playback," upshifting "according to an amount of contiguously available files," and anticipating and "pre-request[ing]" files. Leaning simply does not disclose or suggest these limitations. And with the exception of the

claimed multiple TCP connections, Petitioner does not offer any argument whatsoever as to why or how Leaning might be modified to render obvious these deficiencies, either in view of what was known in the art—i.e., single-reference obviousness—or in view of a secondary reference.

In view of these glaring omissions, PO anticipates that Petitioner will spend the rest of this proceeding attempting to backfill its Petition with obviousness theories that were not raised in the Petition. That is improper. *Ariosa Diagnostics v. Verinata Health, Inc.*, 805 F.3d 1359, 1367 (Fed. Cir. 2015). The question of whether the theories set forth in the Petition establish, by a preponderance of the evidence, obviousness of the “continuous playback” limitation, as well as the other unmet limitations identified herein, must therefore be resolved in PO’s favor.

II. BACKGROUND

A. The Challenged Patent

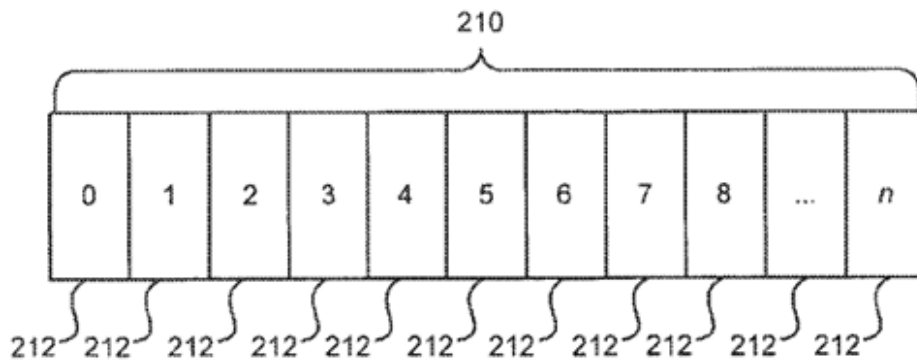
The Challenged Patent is directed to “alleviat[ing] the problems of reliability, efficiency, and latency” when “video streaming over packet switched networks such as the Internet.” EX1001, 1:18-21, 2:39-41. The focus is on “the viewing or listening experience of the user.” *Id.*, 2:20-21; *see also id.*, 2:27-29. As the Challenged Patent explains, “[u]sers generally ... tend to want to see or hear ... media file[s] instantaneously,” and without any “break” or “slowdown” in playback. *Id.*, 1:49-50, 2:13-15, 2:20-21. The Challenged Patent notes that three previously-attempted techniques—downloading, conventional streaming, and progressive downloads—

failed to address the “problems and needs in the art,” which the Challenged Patent overcomes by enabling continuous streaming playback. *See id.*, 1:31-2:5, 2:52-55.

1. Downloading Rather Than Streaming

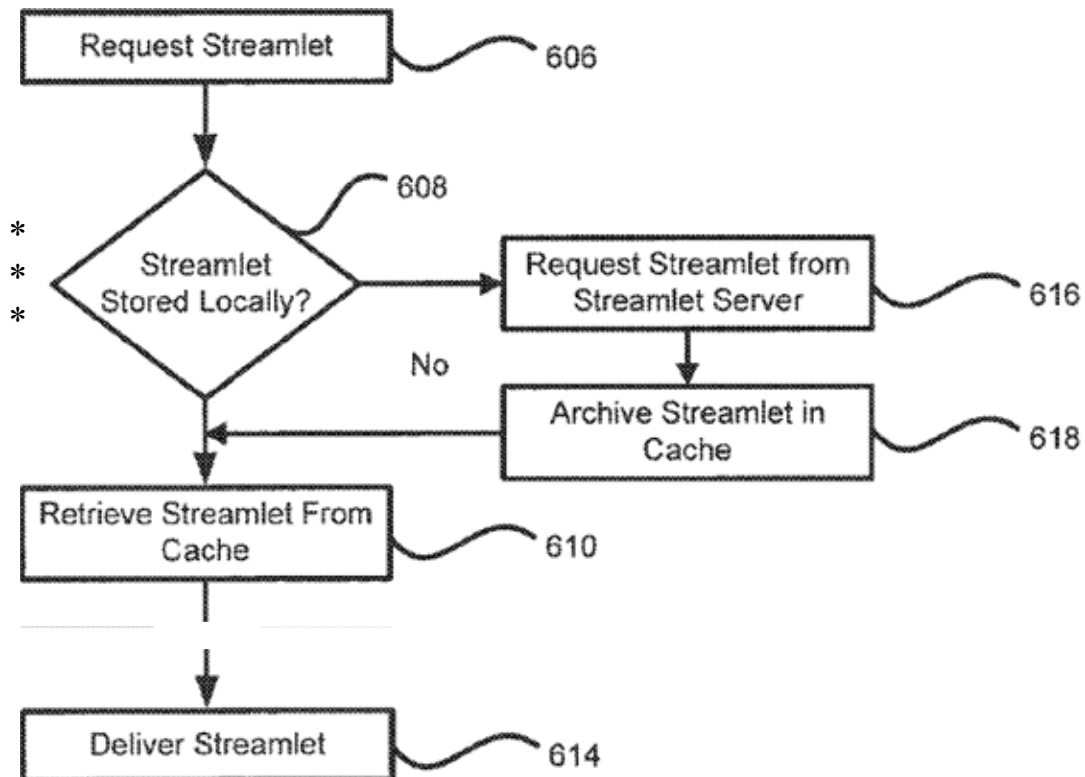
The first previously-attempted technique addressed by the Challenged Patent is “[d]ownloading *complete* media files,” which “can take large amounts of time,” resulting in a long latency period before playback. EX1001, 1:44-46, 1:54-58.³ The Challenged Patent addresses these drawbacks by time-dividing media files into smaller portions, or “streamlets,” and allowing playback to begin *as soon as a single streamlet is received*, rather than waiting for the entire media file to download.

As depicted below, the patent discloses exemplary streamlets **212** as being “independent media object[s]” that correspond to 2-second portions of a larger stream **210**. *Id.*, 6:58-63, Fig. 2c.



³ Emphasis added throughout, unless noted.

The Challenged Patent also discloses an exemplary process for requesting (Step 606), downloading (Step 618), and playing back (Steps 610 & 614) a single streamlet. *Id.*, 11:35-67, Fig. 6.

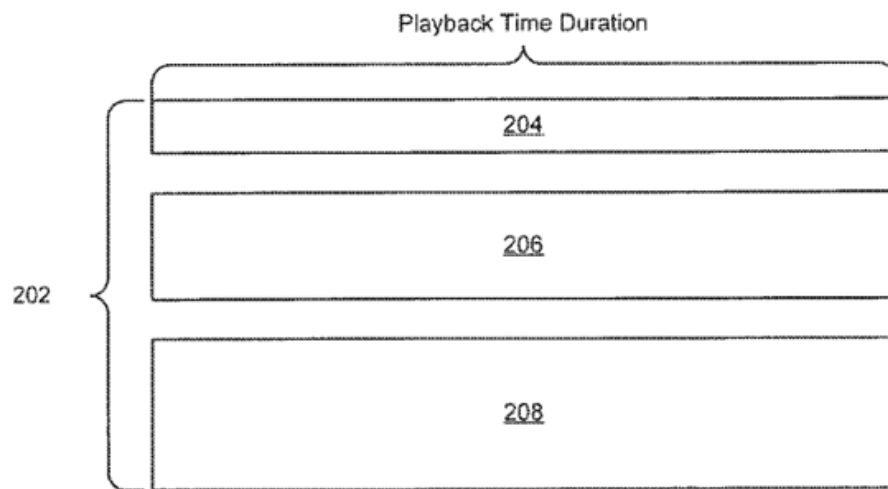


The Challenged Patent allows playback to begin upon receipt of a single 2-second streamlet, as evidenced by the singular form of “streamlet” in the figure above and the accompanying written description. The specification contrasts this with an “alternative” embodiment in which “a plurality of streamlets” are requested for staging before playback. *See, e.g.*, EX1001, 11:40-44.

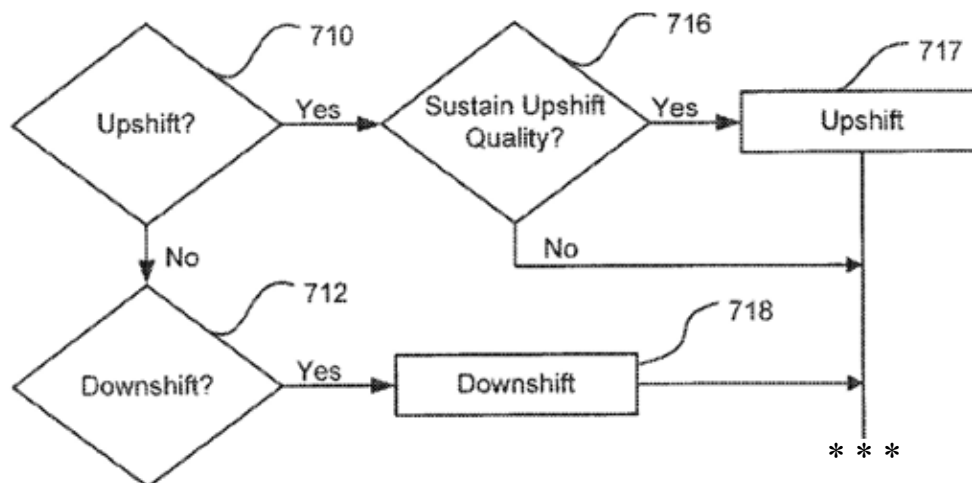
2. Non-Adaptive Streaming

Conventional streaming involves “deliver[ing] content ... to a user ... *as the data is received*,” which is “vulnerable to network failures or congestion” that can

result in “delays or losses” during playback. EX1001, 1:31-33, 1:60-61, 2:13-18. To allow for effectively instantaneous and continuous playback of content despite network congestion, the Challenged Patent adopts an adaptive bitrate streaming approach, entailing the creation of different copies of its streamlets at different bitrates (e.g. low, medium, and high quality) and inserting a step into the process (Step **610**) that responds to changes in network conditions. *Id.*, 6:48-52, Fig. 2b.



In particular, the specification describes a process for determining whether to perform a rate shift. *Id.*, Fig. 7.; *Id.*, 3:11-15, 3:20-2.



The inventors also realized that, by dividing the copies of video into streamlets, the video stream could be delivered over multiple TCP/IP⁴ connections, further improving performance over a congested network. EX1001, 9:34-35; 10:15-18. That way, “[w]hen a TCP connection fails completely” or “a request is not being satisfied in a timely manner, a redundant request may be sent on a different connection for the same streamlet 212.” *Id.* at 9:59-63. This “achieve[s] the latency-reduction efficiency benefits of pipelining while maintaining the independence of each streamlet **212** request,” which further ensures continuous playback. *Id.*, 10:15-18.

3. Progressive Downloading

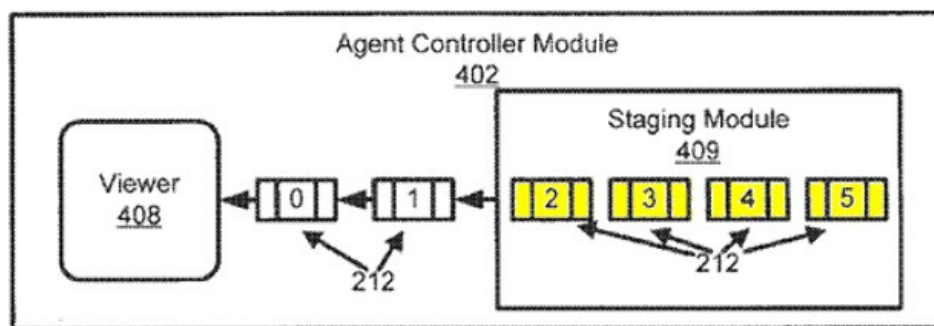
The Challenged Patent also explains how it overcomes the shortcomings of a third type of content delivery—progressive downloading. That technique allows playback to begin before the content is “*completely downloaded.*” EX1001, 1:62-2:1. But it “is not a complete or fully acceptable solution to the problem of media presentation over a network” because it “*waits* to begin playback until there is enough of the file downloaded” into a buffer so playback can begin without “catch[ing] up” to (overtaking) the download, which results in playback disruption while the buffer refilled. *Id.*, 1:64-2:1. These delays “can be substantial depending on network conditions.” EX1001, 2:2-5.

⁴ Transmission Control Protocol/Internet Protocol.

The invention of the Challenged Patent avoids these known issues with progressive downloading because the patent discloses (i) shifting between different bitrates in response to changes in network conditions, rather than waiting to re-buffer the same bitrate version of the stream (*see supra* § II.A.2), **and** (ii) allowing playback to begin after only a single streamlet of the new bitrate has been received (*see supra* § II.A.1).

4. ABR Streaming to Achieve Continuous Playback

The Challenged Patent discloses avoiding disruptions and achieving continuous playback by buffering any received, but not yet played, streamlets in its “staging module” (depicted below) and arranging them in the correct order for playback, even if a decision to shift to a different bitrate is made. This allows for arranging streamlets of different quality levels in the buffer. EX1001, Fig. 4 (highlighting added).



Before shifting bitrates, the Challenged Patent examines “the amount of contiguously available [un-played] streamlets that have been sequentially arranged by the staging module” (which the patent describes as a “***read ahead*** margin”) and “discourage[s] upshifting until a larger read ahead margin may be established.”

EX1001, 12:43-53; 1:64-2:1. Thus, the adaptive-rate shifting streaming technology of the Challenged Patent relies on the time it will take to play those streamlets to determine whether a shift to a new bitrate should be performed.

The Challenged Patent also discloses that another technique for achieving continuous playback is to “request streamlets at any interval less than the length of the time index,” so that smaller streamlets are received. *Id.*, 8:46-57. These techniques “enable[] a ‘fast-start’ capability with no buffering wait when starting,” including when starting a stream of a different bitrate. *Id.*, 8:50-57.

During prosecution of the '772 Patent, which issued from the parent application of the Challenged Patent, PO amended each independent claim of that patent to require the making of shifting determinations “to achieve continuous playback of the video using [the files] of the highest quality one of the copies determined sustainable at that time,” explaining that this requirement distinguished over the prior art methodologies. IPR2024-00919, Paper 3 ('772 Patent Petition) at 8-9 (describing “continuous playback” amendment and related applicant argument during prosecution). PO made the same pertinent amendment to each independent claim of the Challenged Patent, noting to the Examiner that the Board had found the prior art failed to disclose the amended claims of the '772 Patent. EX1002, 222-25, 229-30.

B. Leaning

Leaning is directed to delivering digitally coded material using a buffering methodology akin to the “progressive download” technique discussed above. EX2141, ¶47. Indeed, every embodiment disclosed in Leaning “*waits* to begin playback until there is enough of the file downloaded,” like the prior techniques described in the Challenged Patent. *Id.*; EX1001, 1:64-2:5.

Leaning includes a flowchart of pseudo-code disclosing, step-by-step, its process for audio rate shifting. *See* EX1004, 9-11. Although Leaning discusses possible modifications—e.g., omitting “the first of the three AND conditions” in one step (*id.*, 15:7-8)—the inscrutable nature of the Petition makes it impossible to determine which, if any modification, is part of Petitioner’s invalidity grounds.

Regardless, several critical steps that contrast sharply with the Challenged Patent remain unchanged throughout all of Leaning’s embodiments. These result in temporal and content-based discontinuities on playback.

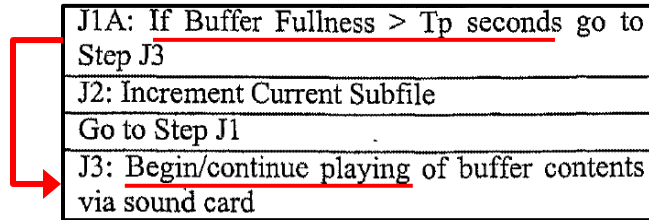
1. Leaning’s Temporal Discontinuities

Leaning discloses that playback—whether from the outset or after rate-switching, fast-forwarding, or rewinding—*will only occur* after the buffer fills with a least T_p seconds of content.⁵ In its pseudo-code, Leaning

⁵ To be sure, Leaning does not disclose or suggest T_p is a value relevant to determinations whether to upshift or downshift.

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discloses this as “If Buffer Fullness > T_p ”. *Id.*, 10 (annotations added).



Leaning describes T_p as the “playout time,” which is “set at 10 seconds” in Leaning’s only example. *Id.*, 5:20-21. And T_p “determines the *degree of buffering* that the terminal performs.” *Id.*, 5:21-22. Thus, Leaning discloses “buffering” at least 10 seconds of content before beginning or resuming audio playback after any rate switch or fastforward/rewind operation.

Additionally, Leaning discloses clearing its audio buffer *every time* its system performs a rate shift (e.g., “Stepup” or “Stepdown” in the pseudo-code) or a fastforward/rewind (e.g., “jump” in the pseudo-code). EX1004, 10-11. Below are excerpts from Leaning showing these “clear buffer” requirements. *Id.* (annotations added).

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```
If UserCommand = Jump(j%)then:  
  Clear buffer;  
  Set CurrentSubfile =  
  Integer[(LFI+1)*j/100];  
  go to Step J1
```

```
Stepup:  
Clear Buffer  
Set RateD = RateC  
Set StemD = StemC  
Set RateC = RateU  
Set StemC = StemU  
Set RateU = next higher rate in list or zero if  
none  
Set StemU = Stem + "/" + item in rate list  
corresponding to this rate  
Go to Step J1A
```

```
Stepdown:  
Clear Buffer  
Set RateU = RateC  
Set StemU = StemC  
Set RateC = RateD  
Set StemC = StemD  
Set RateD = next lowerr rate in list or zero if  
none  
Set StemD = Stem + "/" + item in rate list  
corresponding to this rate  
Go to Step J1A
```

Leaning explains that shifting bitrates “when the buffer is already empty is *advantageous* as the sound card is *not playing* anything and it may be necessary to reconfigure it.” *Id.*, 8:20-23. And with respect to fastforward/rewind, Leaning explains that “[w]e *prefer ... to suspend decoding and clear the buffer* so that the new request [for a sub-file] is sent immediately.” *Id.*, 11:19-20.

The “Clear Buffer” command is executed during all rate shift and fast-forward/rewind operations. After each of those operations, Leaning’s pseudocode returns to the “If Buffer Fullness > T_P” inquiry, as depicted below. EX1004, 10-11 (annotations and highlighting added).

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Start Here

User	Terminal	Server
	Set Current Subfile = 000000.bin	
	J1: Set URL = StemC + Current Subfile	
	Request this URL	

* * * *

	Decode received subfile	
	Write to buffer	
	J1A: If Buffer Fullness > Tp seconds go to Step J3	
	J2: Increment Current Subfile	
	Go to Step J1	
	J3: Begin/continue playing of buffer contents via sound card	
	J4: If Buffer Fullness < Tp seconds go to Step J2	
	If BufferFullness = 0 AND MRate < CurrentRate AND BufferLow% > Td go to Stepdown	
	If MRate > NextRate AND NextRate > 0 goto Stepup	
Input of user commands	If UserCommand = Pause then: Stop reading from buffer; Loop until Usercommand = Resume; go to J3	
	If UserCommand = Jump(j%)then: Clear buffer; Set CurrentSubfile = Integer[(LFI+1)*j/100]; go to Step J1	
	Go to Step J1A	
	Stepup: Clear Buffer Set RateD = RateC Set StemD = StemC Set RateC = RateU Set StemC = StemU Set RateU = next higher rate in list or zero if none Set StemU = Stem + "/" + item in rate list corresponding to this rate Go to Step J1A	
	Stepdown: Clear Buffer Set RateU = RateC Set StemU = StemC Set RateC = RateD Set StemC = StemD Set RateD = next lowerr rate in list or zero if none Set StemD = Stem + "/" + item in rate list corresponding to this rate Go to Step J1A	

These features of Leaning ensure that, during and after any rate shift or jump, Leaning halts audio playback until the buffer fills beyond the “playout time T_p ”—i.e., until there is another 10 seconds of content downloaded and stored in the buffer. Leaning is explicit that *the user will not experience continuous playback*: “If, during this process, the buffer becomes empty, the player program simply *ceases playing until further data arrives.*” *Id.*, 6:10-11; *see also id.*, 8:20-23 (“the sound card is *not playing anything*” when “the buffer is already empty”); EX2129 (Houh Tr.) 91:19-92:5 (“if the buffer becomes empty the player program *ceases playing....*”).

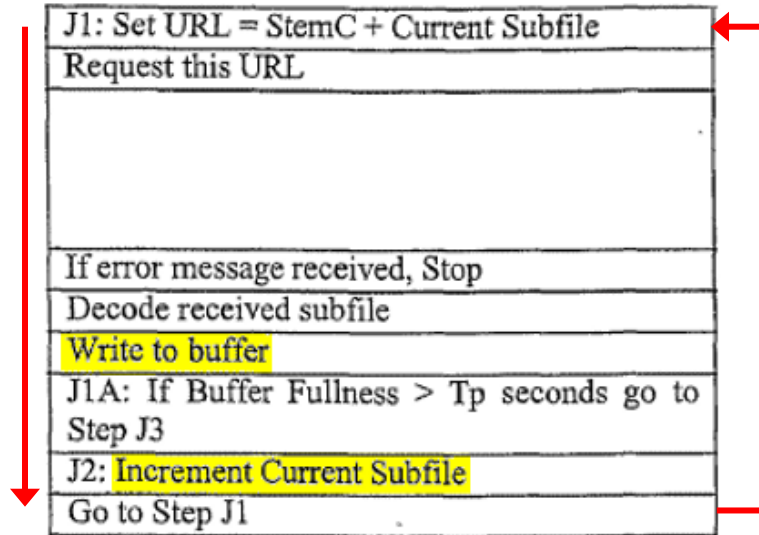
Thus, Leaning’s buffering methodology suffers from the same failings as conventional progressive downloading—namely, *temporal discontinuity* in playback—which the Challenged Patent explains “is not a complete or fully acceptable solution to the problem of media presentation over a network.” EX1001, 2:2-5.

2. Leaning’s Content-Based Discontinuities

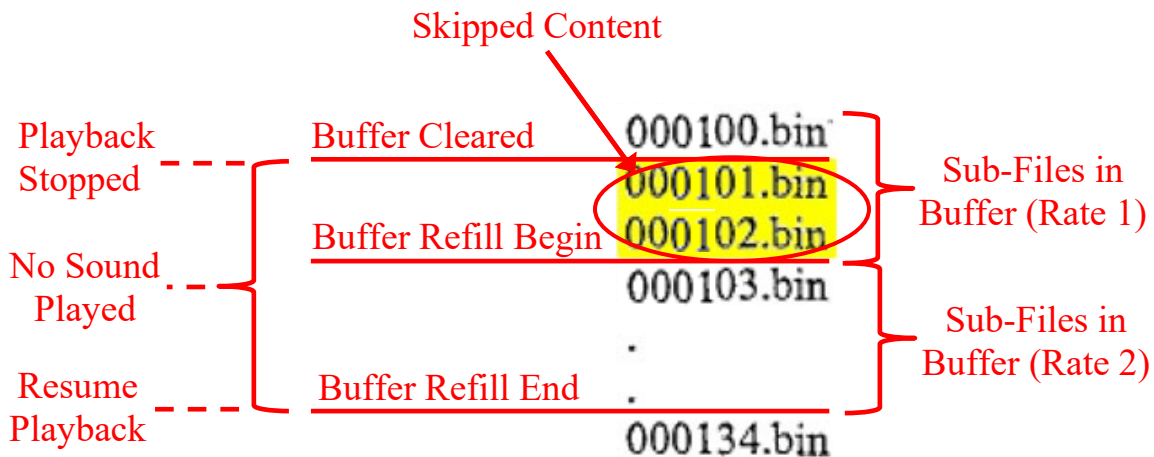
Because Leaning also *clears* its buffer during playback, there also is a *content-based discontinuity* in which any sub-files stored in the buffer at the time the rate shift occurs will be skipped because they will be purged from the buffer. EX2141, ¶78.

This content-based discontinuity occurs not only because Leaning clears its buffer, but also because Leaning increments the sub-file number sequentially every

time a sub-file is written to the buffer, *without accounting for the buffer being cleared*. EX1004, 10 (annotations added); EX2141, ¶79.



This means that the next sub-file requested after a rate shift occurs will be the sub-file *after* the last sub-file stored in the buffer, which may not have been played yet, as depicted below. EX1004, 3:12-18 (annotations added and “100” added to initial four sub-file names to simplify illustration).



In this example, Leaning would perform an upshift (Stepup) after requesting sub-file “00102.bin” but before sub-files “000101.bin” and “000102.bin” are played

back, resulting in sub-files “000101.bin” and “000102.bin” being cleared from the buffer and skipped. Playback would resume at sub-file “000103.bin” after the buffer refills. EX2141, ¶79. The user therefore experiences both a temporal and a content gap.⁶

C. Claim Construction

No construction of any claim term is required because the Petitioner fails to meet its burden of showing that each and every limitation of the Challenged Claims is disclosed in the prior art under any construction, including their own.

III. THE PETITION FAILS TO DEMONSTRATE THAT ANY CLAIMS OF THE CHALLENGED PATENT ARE UNPATENTABLE

Petitioner relies solely on Leaning combined with the knowledge of a POSITA as allegedly disclosing or suggesting every limitation of every claim of the Challenged Patent, except the multiple TCP connections recited in dependent Claims 9 and 11. But Leaning fails to disclose or suggest at least the following limitations, not found in any of the secondary references relied upon by Petitioner.

A. Petitioner Failed to Address the “Continuous Playback” Limitation

⁶ Examples of Leaning’s temporal and content-based discontinuities are illustrated in the demonstrative of Leaning’s pseudocode flowchart submitted herewith as EX2133. EX2141, ¶79, n.6.

1. Leaning Fails to Disclose or Suggest “Continuous Playback”

Each independent claim in the Challenged Patent recites making determinations to “shift the playback quality ... to achieve continuous playback.” The Challenged Patent discusses several ways in which this may be achieved. *Supra* §II.A. And while each of these exemplary techniques separately enables claims directed to a “shift ... to achieve continuous playback,” the independent claims that include this recitation are not limited to any one of these techniques.⁷

Regardless, Petitioner fails to address this limitation at all. And because PO has not previously argued the merits, this limitation also was not discussed in the Institution Decision. Paper 14. The only mention of the “continuous” requirement in Petitioner’s analysis of element 1[D]⁸ is to state that it is “explained above” regarding elements 1[C][1]/[2]. Pet., 36. But those sections do not address the “continuous playback” requirement. *See id.*, 33-36. Indeed, the word “continuous” does not appear anywhere in the Petitioner’s analysis other than its conclusory

⁷ The dependent claims are addressed to some of these specific techniques. *See* Claims 2, 5, 6, 9, and 11.

⁸ For element 8[C][3], which also includes a “continuous playback” limitation, Petitioner simply incorporates its argument for element 1[D] by reference without any additional argument. Pet., 50. Thus, the arguments here apply equally to independent Claim 8 and, more specifically, element 8[C][3].

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assertion that the claim language is disclosed in Leaning. Thus, Petitioner fails to carry its burden.

The only portions of Leaning that Petitioner does explicitly analyze in elements 1[C] and 1[D] relate to Leaning's audio pseudo-code, including its "Clear Buffer" commands. Pet., 37-38. However, this cannot satisfy the "continuous" requirement. Element 1[D] recites: "making the successive determinations to shift the playback quality based on the factor to achieve continuous playback of the video using the files of the highest quality one of the copies determined sustainable at that time so that the media player upshifts to a higher quality one of the different copies when the factor is greater than a first threshold and downshifts to a lower quality one of the different copies when the factor is less than a second threshold," with highlighting added to distinguish between the different limitations of this element. Below is the entirety of what Petitioner argues with respect to each, carrying through the above highlighting for clarity.

Element 1[D]	Petitioner's Argument ⁹
"making the successive determinations ... using the files of the highest quality one of the copies determined sustainable at that time"	"Leaning teaches choosing the highest quality copy that is sustainable (<i>i.e.</i>, if measured rate > current rate AND measured rate > next highest rate for period of time, then shift up until no longer true—meaning shift up to highest sustainable version)." "Leaning discloses looping 'Stepup' until the

⁹ In support of these arguments, Petitioner cites elements 1[C][1]-1[C][2], Leaning, 8:17-26, 9:3-7, 9-11, claims 4-6, and Houh Decl. (EX1003), ¶¶81-82.

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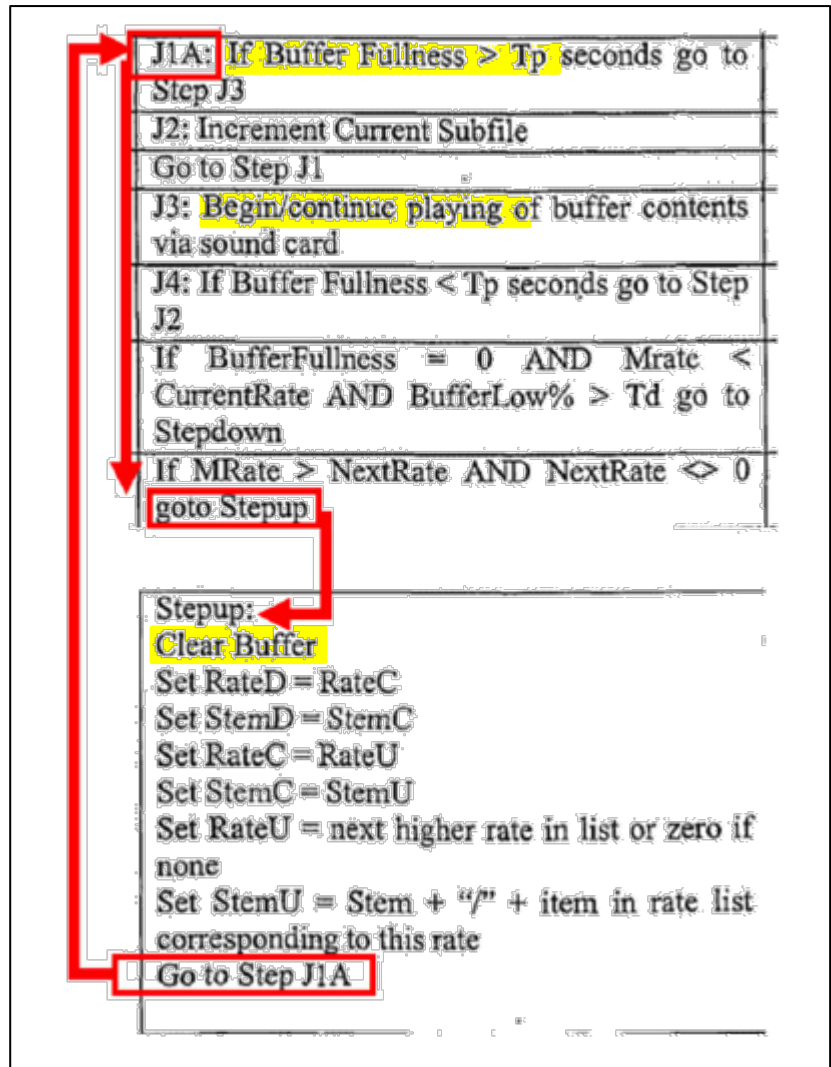
	highest sustainable rate is achieved up to the highest available rate (by setting RateU to zero).”
“to shift the playback quality based on the factor to achieve continuous playback of the video”	—
“so that the media player upshifts to a higher quality one of the different copies when the factor is greater than a first threshold”	“... Leaning’s process flowchart below shows that the player on the terminal beginning with step J1A moves through the process and if ‘MRate [measured rate] is greater than NextRate [next highest rate] AND NextRate $\neq$ 0 [there exists a next higher rate] then go to Stepup; and the Stepup process shifts up by changing the RateC [current rate] to the RateU [next highest rate] and changes RateU to the next higher rate, or to ‘0’ if the current rate is the highest rate then loops back to step J1A and continues the process ...” (bracketing original to Petition) “Leaning further discloses that that the media player (player program) upshifts to a higher quality one of the different copies when the factor (the ‘measured rate’ factor) is greater than a first threshold (the ‘next higher rate’ for a given period of time)”
“so that the media player ... downshifts to a lower quality one of the different copies when the factor is less than a second threshold”	“Leaning further discloses that that the media player (player program) ... downshifts to a lower quality one of the different copies when the factor is less than a second threshold (‘current rate’ (and when the Buffer Low Percentage more than a Step Down Threshold)).”

As apparent from the above, none of Petitioner's arguments (here or with respect to element 1[C]) address the "continuous playback" limitation.¹⁰

Petitioner also includes a demonstrative (shown below), lifted from Leaning's pseudo-code. But again, Petitioner focuses on the upshift requirement of element 1[D], completely ignoring the "continuous playback" requirement.

¹⁰ Petitioner acknowledged the import of the "continuous playback" limitation in summarizing the prosecution history of the Challenged Patent's parent in IPR2024-00919, Paper 3 at 8-9.

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DEMONSTRATIVE



Pet., 38 (citing EX1004, 10) (red annotations original to Petition, yellow highlighting added). Indeed, Petitioner ignores the yellow highlighted portions of the demonstrative, which establish that *every time* Leaning performs the purported upshift, at the “Stepup” routine, it clears the buffer (“Clear Buffer”) and then *waits* until the buffer is refilled (“If Buffer Fullness > T_P”) before resuming playback (“Begin/continue playing”). This parallels the “progressive download” approach disparaged by the Challenged Patent, albeit with potentially different bitrate content.

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Petitioner's own demonstrative therefore shows that Leaning's playback is *not* "continuous," during a rate shift, as required by element 1[D]. Instead, during *every shift*, Leaning consistently teaches clearing the buffer then restarting the process to re-fill the buffer with T_p seconds of content. This explicitly causes the loss of audio content and introduces both temporal and content discontinuities. EX2141, ¶72.¹¹ Petitioner's inability to show that Leaning discloses "continuous" streaming is not surprising because, as explained above, Petitioner's cited portions of Leaning are not concerned with continuous streaming at all. *See supra* §II.B.

Notably, the Petition here is a copy-cat of another petition that third-party Aylo Freesites Ltd ("Aylo") filed on January 30, 2024. More than a year later, Aylo was forced at the European Patent Office to rely on new portions of Leaning to address the same "continuous playback" limitation at issue in this IPR. In doing so, Aylo argued that the precise portions of Leaning's flowchart relied on in this IPR actually disclose a glaring *two-minute discontinuity* at *every upshift*. Aylo specifically states: "Since [Leaning's] upshift simply relates to the next sub-file being requested from the directory in which the higher quality copy is stored ([Leaning], page 9, top), clearing the buffer would mean that for each upshift, there

¹¹ For element 1[D], Petitioner also cites paragraphs 81-82 of Dr. Houh's declaration (EX1003). Those paragraphs are a verbatim reproduction of the Petition's analysis and therefore suffer from the same deficiency.

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is a jump in the file by at least 120 seconds or 2 minutes.” EX2016 (EPO Response) at 8-9; *see* EX2141, ¶¶81-82. Thus, Petitioner’s cited portions of Leaning, e.g., its flowchart, cannot disclose “shifting ... to achieve **continuous** playback” if it actually disrupts playback at every shift, as Aylo admits.

In short, to support its mapping to elements 1[C] and 1[D], Petitioner expressly relies on the very disclosures of Leaning that **disrupt** playback. EX2141, ¶65. Because Leaning intentionally creates the exact type of interruptions in playback that the claimed invention avoids, Petitioner cannot (as it attempts to do) rely on Leaning for this missing element. *See Wonderland Nurserygoods Co. v. Baby Trend, Inc.*, 727 F. App’x 1017, 1020 (Fed. Cir. 2018) (finding that “[s]ubstantial evidence does not support the Board’s finding that” a prior art reference “discloses a single, continuous piece”); *cf Google Inc. v. Koninklijke Philips N.V.*, 2017 WL 2437675, at *6 (PTAB June 5, 2017) (“Petitioner’s ... testimony [is] insufficient to show that a disclosure of substantially continuous scrolling necessarily constitutes a disclosure of non-continuous scrolling.”).

Moreover, this defect is fatal to the Petition because, “[u]nlike district court litigation—where parties have greater freedom to revise and develop their arguments over time and in response to newly discovered material—the expedited nature of IPRs bring with it an obligation for petitioners to **make their case in their petition** to institute.” *Intelligent Bio-Systems, Inc. v. Illumina Cambridge Ltd.*, 821 F.3d 1359, 1369 (Fed. Cir. 2016); *see In re NuVasive, Inc.*, 841 F.3d 966, 971 (Fed. Cir.

2016) (holding PO is “entitled to notice of and a fair opportunity to meet the grounds of rejection [as presented in the petition], based on due-process and APA guarantees”). Petitioner cannot belatedly raise an argument purporting to address the “continuous playback” limitation after failing to advance such an argument in its initial Petition.

Furthermore, Petitioner is foreclosed from introducing modifications or alternative Leaning mappings after exclusively relying on a specific Leaning embodiment as purportedly disclosing this limitation without modification. Pet. 36. Indeed, Petitioner’s expert, Dr. Houh, acknowledged during cross-examination that “the specification of Leaning describes many alternatives and different ways” to perform rate shifting. EX2129 at 90:15-91:14. Having picked and relied upon only one of those ways in the Petition, with no discussion of any “alternatives” or modifications to the selected Leaning embodiment, Petitioner cannot now modify its theory and insert one of Leaning’s various “alternatives” in the place of its chosen embodiment or otherwise argue that it should somehow be combined or modified to read on the claims. *Yita LLC v. MacNeil IP LLC*, 69 F.4th 1356, 1366-67 (Fed. Cir. Jun. 6, 2023) (Precedential) (affirming Board decision not to consider new reply argument that a POSITA would have modified the prior art; finding same was a “meaningfully distinct contention” from petition argument limited to what the prior art reference disclosed).

2. Petitioner Fails to Carry Its Burden of Showing that Leaning's Teachings Regarding Delivering *Audio* Can Be Applied to the Claimed Requirements for Delivering *Video*.

Every claim of the Challenged Patent is directed to rate shifting *video*. Yet, Petitioner cites almost exclusively to Leaning's discussion of rate shifting *audio* in its invalidity arguments. While Petitioner contends (*for the entirely different element 1[A][3]*) that the "same principle may be applied to the delivery of video recordings," the shortcomings of Leaning's buffer-filling methodology discussed above are compounded when applied to the delivery of video recordings. EX1004, 16:6-7; *see also* Pet., 20 (citing EX1004, 16:6-12); EX2141, ¶84.

Leaning itself acknowledges that there are "further implications" when applying this "same principle" to video recordings. *Id.*, 16:17-18. Petitioner fails to consider these "further implications" and, therefore, fails to carry its burden of showing that the principles it relies on in Leaning with respect to *audio* could also achieve "continuous playback" when delivering *video* with a reasonable expectation of success. EX2141, ¶67; EX1004, 16:6-18 (cited at Pet., 17, 20).¹² These "further

¹² Leaning's passage 16:6-7 immediately follows its teachings toward the inclusion of subtitles/image thumbnails with audio subfiles (EX1004, 15:9-16:5). Petitioner fails to explain how or why a POSITA would interpret 16:6-7 of Leaning as applying all its audio streaming principles to video, rather than simply applying the subtitle/image principle to video.

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implications” include “serious mistracking of the decoder,”¹³ which is yet another manner in which Leaning’s rate shifting interrupts “playback.”¹⁴ EX1004, 16:20-31; EX2141, ¶67. And although Petitioner also cites to another portion of Leaning that also discusses video, it is directed to fast forwarding and rewinding functionality, which are a distinct (and separately claimed) functionality from rate shifting. *See* Pet., 44 (citing EX1004, 16:11-18:17 “functionality for fast forward and fast reverse modes”); EX2141, ¶85. Petitioner also fails to show the relevance of these teachings to rate shifting. Petitioner bore the burden to provide a detailed explanation in its Petition of how each challenged claim is unpatentable under the statutory grounds identified, and failed to do so.¹⁵

¹³ As Dr. Jeffay explains, the large size of video as compared to audio necessitates compression using complex video coding algorithms, which produce bitstreams that are not amenable to “switching” or rate shifting. EX2141, ¶¶89, 147-49 (citing EX2139, 10:18-32).

¹⁴ Mistracking is explained *infra* at §III.A.3.

¹⁵ To be clear, neither Leaning nor the Petition suggests that clearing the buffer can be omitted for video files. Leaning explains how clearing the playback buffer is “advantageous” during a “rate shift” because it provides time to “reconfigure” the “sound card” and to retrieve the next sub-file “immediately.” EX1004, 8:20-23, 11:19-20; EX2141. EX2141, ¶¶49, 89. A POSITA would have understood that those teachings applied equally to video cards, like Leaning’s video card 36 (EX1004, 4:9-10), which also would have needed to be cleared and reset to decode

3. **Petitioner's Reliance on Leaning's Teaching to *Encode Then Segment Video Cannot Achieve "Continuous Playback"***

The *audio*-based content partitioning technique relied on by Petitioner in Leaning involves two steps, which are performed in an order that precludes the ability to achieve continuous playback when applied to *video*. Specifically, the same source content is encoded at several bitrates and then "partitioned" into sub-files:

In order to provide for rate switching, the person preparing the file for loading onto the server prepares several source files - by *encoding* the same PCM file several times at different rates. He *then partitions* each source file into sub-files

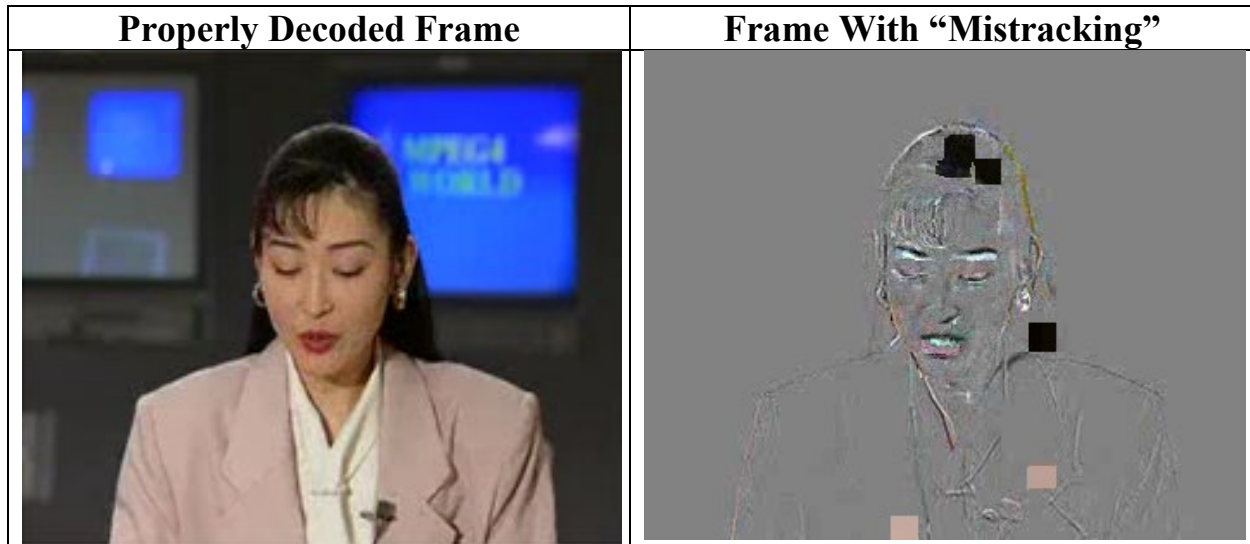
EX1004, 6:21-23; EX2141, ¶93. In other words, Leaning's disclosed approach to *audio* segmentation involves "encoding ... then partition[ing]." And Petitioner relies exclusively on this approach to arrive at the claimed "files." Pet., 20-22. But Petitioner fails to address that partitioning *video* files in this manner would prevent the decoder from properly decoding any partitioned files received after a rate switch, yielding discontinuity and undesirable artifacts in playback. EX2141, ¶94.

the new bitstream. EX2141, ¶¶89-90. Petitioner's expert, Dr. Houh, admitted on cross-examination that (i) Leaning expressly discloses clearing the sound card buffer when rate switching, and (ii) Leaning does not disclose or suggest that the corresponding video card buffer would *not* be cleared for rate switching. EX2020 (Houh Tr.) 103:18-104:9. Clearing the buffer results in the same playback interruptions in video files as occurs with audio files. EX2141, ¶¶88-90.

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Leaning refers to this problem as “mistracking.” EX1004, 16:30. “Mistracking” arises for video, but not audio, because each frame of an audio file is *independently* decodable without any dependencies between frames. EX2141, ¶99. Owing to its far greater amount of data, MPEG video is encoded using a mixture of *independently decodable* frames (“intra-frames” or “I-Frames”), and *dependently decodable* frames (“inter-frames” or “P-Frames”), the latter of which can only be decoded if the decoder has access to other surrounding frames. *Id.* As Leaning explains, problems arise when the player has to decode a dependently decodable video frame for which the decoder does not have the surrounding frames it depends from. *Id.*; EX1004, 16:26-31. Leaning expressly discloses that “mistracking” will occur when rate switching between videos compressed via these “inter-frame” coding techniques. EX2141, ¶99.

The results of “mistracking” are dramatic, as demonstrated by the images below, where the left image shows a properly decoded frame taken from a complete media file and the right image shows the same frame taken from a portion of that same media file. EX2141, ¶94.



The left image was decoded sequentially from the beginning of the media file, while the right frame was decoded sequentially from the beginning of the portion of the media file, rather than the beginning of the media file. The result is that the right image was decoded without the benefit of the preceding I-Frame needed to decode it, which results in a significant loss in image data.

Setting aside that Petitioner does not identify or rely upon any specific video encoding embodiment, the “mistracking” problem infects each video compression format mentioned in Leaning. EX2141, ¶100. As Dr. Houh explained during cross-examination, “the mistracking problem” occurs regardless of encoding format “when a terminal gets a predictively coded frame for which it does not have the preceding frame.” EX2129, 115:18-21. This occurs with H.261-encoded video because that standard “do[es] not provide for the frequent, regular inclusion of intra-frames [or I-Frames].” EX2141, ¶100; EX1004, 16:26-31. And this occurs with MPEG-encoded video because, as a POSITA would understand, generating multiple

copies of an MPEG-encoded video at different bitrates does not produce copies where the I-Frames are at the same frame location within each respective copy. EX2141, ¶101. Thus, video encoded in either H.261 or MPEG formats and then segmented necessarily results in sub-files comprising P-Frames without the prerequisite frames required for decoding. Furthermore, even if copies of an encoded MPEG video were segmented at I-Frame boundaries, switching between sub-files of those copies would still result in discontinuous playback because those sub-file boundaries are not time-aligned.

Critically, Petitioner failed to address this “serious mistracking” problem for video as expressly disclosed by Leaning, failed to show any disclosure of video rate switching in Leaning that would resolve “mistracking,” and failed to explain how or why a POSITA would modify Leaning’s teaching to resolve “mistracking.” Without any cognizable theory to overcome Leaning’s disclosure of *dis*continuous media playback due to “mistracking,” Petitioner has failed to meet its burden to show unpatentability.

B. Leaning Fails to Disclose Requesting Streamlets via “multiple Transmission Control Protocol (TCP) connections” / “a plurality of different TCP connections”

Dependent Claim 2 recites that “the at least one TCP connection comprises multiple Transmission Control protocol (TCP) connections.” Dependent Claims 9 and 11 recite similar features. As the Challenged Patent explains, “a break in the continuity of a TCP connection can have serious consequences when the data must

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be delivered in real-time,” and “delays or losses in a TCP connection” can cause breaks or slowdowns in data transmission that are “detrimental to the viewing or listening experience of the user and therefore ... not acceptable.” EX1001, 2:13-21. The Challenged Patent avoids these delays/losses and maintains continuous playback by using multiple TCP/IP connections to retrieve content. *Id.*, 9:34-35.

More specifically, the Challenged Patent describes making a new, redundant content request on a different TCP connection when a content request “fails completely” or “is not satisfied in a timely manner” via the original TCP connection. EX1001, 9:59-63. “[E]fficiency is raised significantly and latency is virtually eliminated” when multiple TCP connections are used in this manner. *Id.*, 9:43-47.

Leaning, on the other hand, never mentions, nor has any use for, multiple TCP connections. To be sure, Leaning explicitly states that it “need contain no ... provision” for “the masking of errors due to packet loss,” which allows its system to use “an ordinary ‘web server’” to implement its playback process. EX1004, 2:27-32. Leaning discloses that receiving error messages from the server is how each of its client terminals manages the playback of subfiles.

As Leaning explains, its playback process “is repeated until a ‘file not found error’ is returned” by the server to each client terminal. EX1004, 6:1-2. A POSITA would readily appreciate that “an ordinary ‘web server’” would generate a standard “HTTP 404 – File not found” error message under these circumstances. EX2141, ¶109. Leaning’s use of standard “error message[s]” also is reflected in its pseudo-

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code flowchart, which shows that such a message is created when a requested subfile does not exist, causing the user terminal to “Stop” the playback process when it receives this “error message.” EX1004, 10 (highlighting added).

Terminal	Server
Request this URL	
	If requested subfile exists, Send requested subfile; otherwise send error message
If error message received, Stop	

Thus, rather than seeking to avoid receiving error messages, Leaning seeks to create and use them to show the end of a content file.

A TCP error message also may satisfy the “If error message received, Stop” condition in Leaning’s playback process. EX2141, ¶110. If it does not, the playback process would simply stall while waiting for the requested sub-file to be received and decoded—i.e., “Decode received subfile”—as also depicted in Leaning’s pseudo-code flowchart. EX1004, 10 (annotations and highlighting added).

Terminal	Server
Set Current Subfile = 000000.bin	
J1: Set URL = StemC + Current Subfile	
Request this URL	
	If requested subfile exists, Send requested subfile; otherwise send error message
If error message received, Stop	
Decode received subfile	
Write to buffer	

In turn, this results in the buffer emptying while previously downloaded content continues to play out. And, “[i]f, during this process, the buffer becomes empty, the player program simply ceases playing until further data arrives.” *Id.*, 6:3-4. By specifying the occurrence of these types of playback interruptions, Leaning further demonstrates its disinterest in addressing transmission errors of any type, and its corresponding disinterest in using multiple TCP connections to request sub-files.

Furthermore, Leaning describes requesting sub-files individually, *one-at-a-time* in a predefined sequence, such that “there is *no expectation* that a sub-file will be followed by a sub-file other than that which immediately follows it in the *original sequence*.” EX1004, 12:9-11.¹⁶ That there is “no expectation” of receiving sub-files in any order other than their “original sequence” also confirms that Leaning fails to contemplate the use of multiple TCP connections. This is further confirmed by Leaning’s lack of any discussion of how to handle the receipt of sub-files via multiple TCP connections, such as the Challenged Patent’s disclosure of a “staging module” that is “configured to arrange the streamlets **212** in order of ascending playback time.” EX1001, 8:41-42.

¹⁶ The result is that Leaning’s user terminal has no need to know the filenames in advance before requesting those sub-files from the server. EX1004, 5:6-8 (“[T]his system is organised [sic] on the basis that the sub-files are named in the manner indicated above, so that the terminal does not need to be informed of the filenames.”).

Notwithstanding the foregoing, Petitioner and its expert contend that a POSITA would have understood Leaning's teachings of a "terminal requesting sequential subfiles from an ordinary web server using the HTTP 1.0 protocol ... would require using multiple TCP connections because each HTTP request in HTTP 1.0 *must establish a new TCP connection*" Pet., 40 (cross-citing to Pet., 19, EX1003, ¶59). This is plainly wrong. As Dr. Jeffay explains Leaning does not disclose use of HTTP 1.0. EX2141, ¶112. Instead a POSITA would have understood that Leaning's reference to "HTTP" refers to HTTP 1.1, which was in widespread use at the time and, by default, used *persistent* TCP connections wherein a client could make *multiple requests of a server on a single TCP connection*. EX2141, ¶112. Thus, Leaning's references to "HTTP" do not constitute a suggestion that parallel connections are used and, given the ubiquity of persistent HTTP connections at the time, actually teach away from such use. *Id.*

C. Leaning Fails to Initially Request Low Quality Streamlets/Files to Enable Instant Playback

Dependent Claim 7 recites that the claimed media player is configured to "initially request low quality files to enable instant playback of the video, and to subsequently upshift to a better quality copy of the video according to the performance factor." Claim 7 depends directly from Claim 1. And as Claim 1 recites, "the performance factor" of Claim 7 is "a factor indicative of the *current* ability to sustain the streaming of the video using the files from different ones of the copies,

wherein the set of one or more factors relate to the *performance of the network*.” In other words, the claimed “performance factor” indicates the “current ... performance of the network.”

A POSITA would understand that the claimed media player “initially request[s] low quality files” to ensure that playback can begin “instant[ly]” even if the “current ... performance of the network” is poor. EX2141, ¶115. That is because a POSITA would understand that, if the “initially request[ed]” files are of a quality that is higher than the “current ... performance of the network” can support, downloading will be delayed such that “instant playback” is not possible. *Id.*

As shown *supra* in §III.A, Leaning requires filling its buffer past the playout time T_P , and thus does not disclose “instant playback.” And nowhere does Leaning describe bypassing its playout time T_P process before beginning playback. Thus, even if the first sub-file Leaning requests were of a low quality, Leaning could not achieve “instant playback,” as required by Claim 7 of the Challenged Patent.

Furthermore, Leaning fails to disclose “initially request[ing]” a sub-file of a low bitrate in the first instance. The portion of Leaning that Petitioner relies on as allegedly disclosing this limitation describes “[i]nitially” requesting a sub-file with a bitrate of 24 kbit/s. Pet., 47 (quoting EX1004, 8:6-11). Leaning discloses four bitrate options with 24 kbit/s being the second highest option. EX1004, 6:14-16; *see also id.*, 6:27-7:5 (depicting the same range of data rates in the “subdirectory” of the index file). And as Leaning acknowledges, requesting higher quality—i.e., larger—

sub-files results in “extra delay” when starting playback. EX1004, 12:31-33 (“[E]xcessively large sub-files are disadvantageous in requiring a larger buffer and in causing *extra delay* when starting play.”). Thus, Leaning describes initially requesting *high* quality files, not “*low* quality files,” which increases delays and makes “instant playback” impossible.

Leaning therefore fails to disclose or suggest a media player that is configured to “initially request low quality files to enable instant playback of the video,” as recited in Claim 7.

D. Leaning Fails to Disclose Upshifting “according to an amount of contiguously available files”

Dependent Claim 5 recites that “the media player is configured to *upshift* to the higher quality copy when ... the media player determines that the higher quality playback can be sustained according to an amount of *contiguously available files stored by the media player*.” The specification of the Challenged Patent describes an “amount of contiguously available streamlets” as a “*read ahead* margin” and explains how it is used “to discourage upshifting until a larger read ahead margin may be established to withstand network disruptions.” EX1001, 12:43-53. Leaning fails to disclose or suggest considering such a “read ahead margin” when performing an “upshift.”

To perform the claimed “upshift,” Petitioner relies on Leaning’s Stepup routine. Pet., 33-34, 42-44. Leaning describes performing a Stepup only if two

conditions are met: (i) the bitrate measured for a given period (MRate) exceeds the next higher bitrate (NextRate); and (ii) the next higher bitrate (NextRate) is not zero, as depicted in Leaning's pseudo-code flowchart. EX1004, 10; *see also id.*, 9:24-26.

If MRate > NextRate AND NextRate $\neq$ 0
goto Stepup

The only period Leaning describes for measuring bitrates is 120 seconds. *Id.*, 9:24-26. Thus, Leaning describes looking at bitrates of transmissions from the *preceding* two minutes when performing an upshift, rather than the amount of files stored in its buffer for playback. Leaning does not look at the files available for playback in its buffer before making a rate shift because, as discussed *supra* at § III.A, Leaning clears its buffer—i.e., calls a “Clear Buffer” command—as the first step of *any* rate shift (up or down), which would render pointless any attempt to use buffer fullness as a factor in determining whether to upshift (Stepup). EX2141, ¶¶ 80, 125.

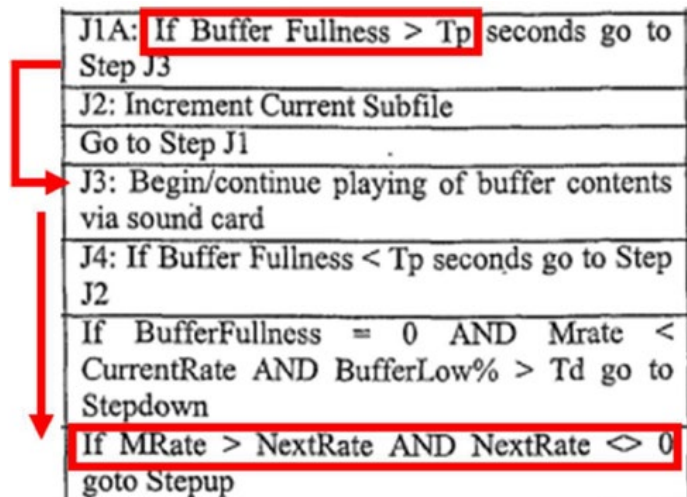
For Claim 5, Petitioner solely focuses on Leaning's playback process at Steps **J1A** and **J3** of its flowchart. For example, Petitioner asserts Leaning “*only allows* for shifting up and/or continuing playing if ‘Buffer Fullness > T_p seconds’” at Step **J1A**. Pet., 43. That is simply not true. Instead, a POSITA would understand that Leaning performs its upshift (Stepup) routine regardless of whether the inquiries performed at Steps **J1A** and **J3**—i.e., “Buffer Fullness > T_p seconds”—are answered

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in the affirmative.¹⁷ EX2141. Only this would allow upshifts to occur in the portions of Leaning relied upon by Petitioner. Thus, an upshift in Leaning is dependent entirely on data rates, not buffer fullness at Step **J1A**.

If one were to adopt Petitioner's flawed logic, then downshifting also would occur only if "Buffer Fullness > T_p seconds" at step **J1A**. That is because the *downshifting* (Stepdown) inquiry is performed *before* the *upshifting* (Stepup) inquiry, as depicted in Petitioner's own annotated portion of Leaning's pseudo-code flowchart below.

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Pet., 43 (annotations in Petition). And if downshifting could only occur if "Buffer Fullness > T_p seconds" at step **J1A**, a *downshift* could *never* occur in this example

¹⁷ The same is true for Leaning's Stepdown routine and Step J4, which refers to "Buffer Fullness < T_p seconds." EX1004, 10.

because “Buffer Fullness = 0”—one of the conditions precedent for a *downshift*—would never occur under these circumstances. Certainly, Leaning would not have included this condition in its pseudo-code flowchart if it could never be met under any circumstances.¹⁸

At bottom, Leaning’s upward rate change routine does not depend on, nor is it influenced by, the amount of data determined to be in the buffer at Step **J1A**. This is confirmed by the fact that Leaning’s buffer is cleared as the first step in its each rate change routine, rendering the contents of the buffer meaningless. Leaning therefore fails to disclose or suggest that “the media player is configured to upshift to the higher quality copy when ... the media player determines that the higher quality playback can be sustained according to an amount of contiguously available files stored by the media player,” as recited in dependent Claim 5.

E. Leaning Fails to “anticipate file requests and pre-request files”

Dependent Claim 6 recites that the claimed media player is configured to “*anticipate* file requests and *pre-request* files to enable fast-forward, skip randomly, and rewind functionality.” The Challenged Patent explains this concept as “the agent controller module **402** ... *anticipat[ing]* streamlet **212** requests and *pre-request[s]* streamlets **212**” before they are actually needed, such as “in anticipation of the end

¹⁸ PO recognizes that Leaning discusses omitting this requirement in an alternative embodiment. *See* EX1004, 15:7-8. But there would be no reason to include this requirement in *any* embodiment if it could *never* be met.

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user **104** selecting new content to view.” EX1001, 8:46-50, 8:57-62. Nowhere does Leaning disclose or suggest such a concept, particularly in the context of “fast-forward, skip randomly, and rewind functionality.”

Rather than anticipating and pre-requesting streamlets, as disclosed in the Challenged Patent, Leaning describes enabling “fast forward or fast reverse” by providing an entirely different set of video sub-files encoded at different bitrates and “amending the sub-file address” to denote that difference. EX1004, 16:11-16. “On fast forward play at, for example, 5 times normal speed, one encodes only every 5th frame.” *Id.*, 16:33-17:1. Leaning describes giving the resulting sub-files a subdirectory address with the suffix “x5” in it, as depicted below.

Directory	Subdirectory	Filename
mpg_name	096k_x1	000000.bin
		000001.bin
		...
		000134.bin
	096k_x5	000000.bin
		...
	.	000134.bin

Id., 17:16-19. This is an entirely different approach to fast forwarding and rewinding than the “anticipat[ing]” and “pre-request[ing]” functionality recited in Claim 6.

Leaning’s “jump” routine, which Petitioner analogizes to the claimed “fast-forward,” “rewind,” and “skip randomly” functionality, also does not involve “anticipat[ing]” and “pre-request[ing]” streamlets. Pet., 45. Instead, as discussed *supra* at § III.A and depicted below, Leaning’s “jump” routine requires clearing the buffer—just like Leaning’s Stepup and Stepdown routines.

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If UserCommand = Jump(j%)then: <u>Clear buffer;</u> Set CurrentSubfile = Integer[(LFI+1)*j/100]; go to Step J1
--

EX1004, 10 (annotation added); *see also id.*, 11:12-20. As also discussed *supra* at § III.A, Leaning lauds its buffer-clearing step, explaining with respect to the “jump” process that “[w]e prefer, in the case of the jump, to suspend decoding and clear the buffer so that the new request [for a sub-file] is sent *immediately*.” *Id.*, 11. This shows that Leaning does not “anticipate” or “pre-request” the next sub-file needed to perform a “jump,” as those sub-files would be cleared from the buffer before they could even be used.

Even if, *arguendo*, Leaning’s discussion of storing a certain number of sub-files in a buffer before beginning playback could be considered “pre-request[ing],” there is nothing “anticipate[d]” by Leaning in this regard. Leaning clears its buffer as the first step in its rate shifting routines and its “jump” routines. This defeats the purpose of “anticipat[ing]” sub-files because any sub-files that are “pre-request[ed]” on that basis will be discarded, rather than used for playback. Instead, Leaning’s considerations in this regard are entirely backward-looking or, in the case of a “jump,” determined on the fly.

For its “jump” routine, for example, Leaning responds to a user “moving a cursor to a desired point on a displayed bar,” which simply cannot be predicted in advance. *Id.*, 11:12-17. EX2141, ¶136. Leaning’s Stepup routine looks backward at

the 120-second measured bitrate (MRate) *prior to* making the upshift determination. EX1004, 8:24-26, 10. And Leaning's Stepdown routine looks at the current state of the buffer—i.e., “Buffer Fullness = 0,” and optionally at the same measured bitrate (MRate) and whether “the measured Buffer Low Percentage exceeds a Step Down Threshold”—*prior to* making the downshift determination—i.e., “BufferLow% > T_d.” *Id.*, 8:18-28, 10. Thus, Leaning fails to disclose or suggest a media player that is configured to “*anticipate* file requests and *pre-request* files,” particularly in the context of “fast-forward, skip randomly, and rewind functionality.”

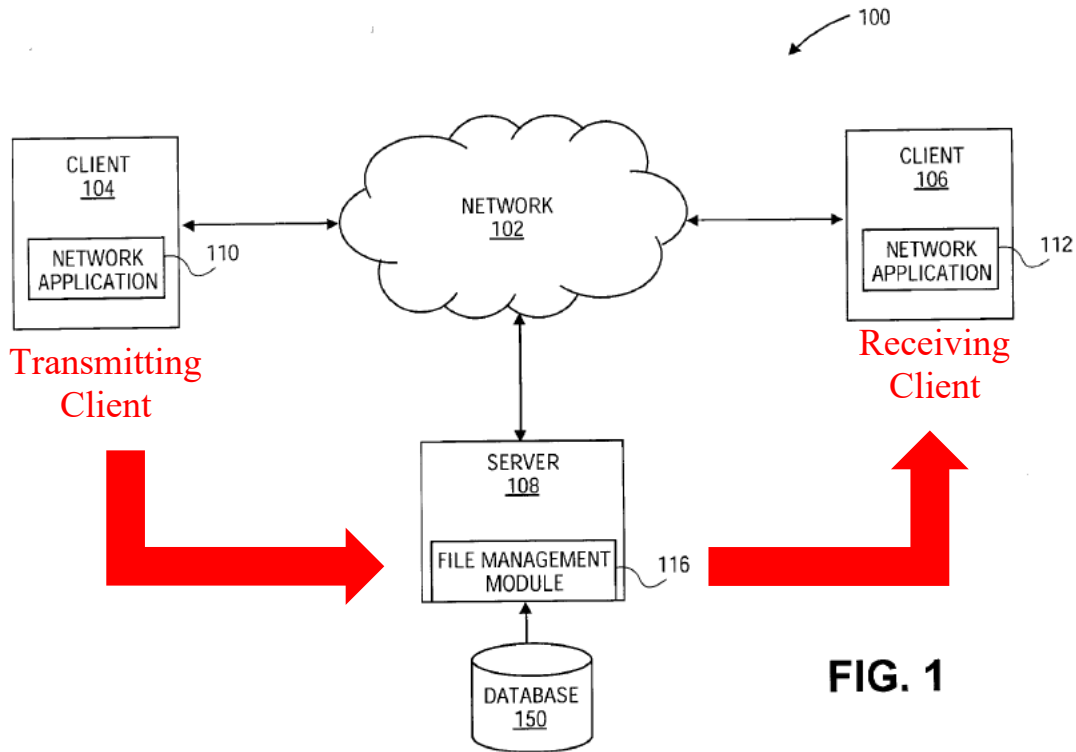
F. Gamble Fails to Cure the Deficiencies of Leaning

In Ground 2, Petitioner relies on the combination of Leaning and Gamble as allegedly rendering obvious the portion of dependent Claims 9 and 11 pertaining to requesting “sub-parts” of files via different TCP connections. Pet., 58-60.¹⁹ This combination fails because, like Leaning, Gamble also does not disclose or suggest “*requesting* the plurality of sequential files ... over different ones of the plurality of different TCP connections.”

Gamble is, instead, directed to “data processing systems ... for transferring large data files over parallel connections.” EX1020, ¶[0001]. Gamble's disclosed file transfer techniques involve “transferring [a] data file **702A** at a client **104** to

¹⁹ Petitioner does not challenge Claim 2, which also recites “*multiple* Transmission Control protocol (TCP) connections,” under Ground 2.

client **106** via a server **108**,” as depicted below. *Id.*, ¶[0042], FIG. 1 (annotations added).



“Initially, a send buffer” is created at Gamble’s transmitting client to store “segments of [a] data file.” *Id.*, ¶[0045]. The “send buffer” includes “four sub-sections **B1** through **B4** to store N=4 [] segments.” *Id.* Next, each “segment in sub-buffers **B1** through **B4** is sent on one of the N=4 parallel connections to server **108**,” where the segments are stored in “stream buffers” and “transmitted” to receiving client **106** over corresponding “independent” connections before the data file is reconstructed at the receiving client. *Id.*, ¶[0049]. Thus, while Gamble discusses *transmitting* “segments” of a larger file over multiple “connections,” Gamble fails

to disclose or suggest “**requesting**” segments, files, or even sub-files over multiple TCP connections, as claimed. EX2141, ¶174.

Furthermore, in Gamble, it is the **transmitting** client that establishes “parallel connections” for sending each segment to the receiving client (via that intermediate server). EX1020, ¶¶[0021], [0039]; EX2141, ¶175. The transmitting client does all this **without receiving any segment requests** from the **receiving** client. In fact, Gamble is silent on any request at all from the receiving client, much less requests over multiple TCP connections. Accordingly, Gamble fails to disclose or suggest “receiving” requests over multiple TCP connections, as claimed.

Petitioner contends that a POSITA “would have been motivated to configure Leaning’s apparatus to request sub-parts ... over different TCP connections ... as taught by Gamble.” Pet., 59. But, as discussed directly above, Gamble does not disclose or suggest any such client “requests” for sub-parts. Moreover, Petitioner fails to account for Gamble’s “server **108**” (the “intermediate server” above), and how or why a POSITA would have incorporated that critical element of Gamble into Leaning’s system. EX2141, ¶176. Accordingly, Petitioner’s combination fails.

IV. **STRONG EVIDENCE OF OBJECTIVE INDICIA PRECLUDE OBVIOUSNESS**

No fewer than five categories of objective indicia constitute independent evidence of nonobviousness of the Challenged Claims. *Apple Inc. v. Samsung Elecs. Co.*, 839 F.3d 1034, 1048 (Fed. Cir. 2016) (“Objective indicia of nonobviousness must be considered in every case where present”). *MOVE Networks, Inc.*

(“MOVE”) is the predecessor owner of the patents and first commercialized the patented technology. MOVE revolutionized how content is delivered and experienced over the Internet by successfully developing the Emmy-winning adaptive-bitrate (“ABR”) technology of the Challenged Patents, which are fundamental to modern Internet streaming, and provide for scalable Internet video streaming without freezing, delays, or other errors. Mr. Major, a pioneer in networking technology and Chief Scientist at Novell and later named a Cisco Fellow, developed this solution and realized his concept would support fast startup of playback, intelligent shift on-the-fly between different video qualities in response to changing network conditions, and a continuous playback of content that would not freeze or buffer. EX2020 ¶¶10-16, 20. Microsoft explained that “MOVE has developed an adaptive streaming technology that *seamlessly* adjusts image quality to fit available bandwidth on each viewer’s Internet connection, creating a *high-quality* Internet television *viewing experience*.” EX2070, 2; EX2141, ¶257.

MOVE’s Media-Player, which embodied the patented ABR technology, was commercially launched in 2006. EX2024. Using the patented ABR technology recited in the Challenged Claims, news articles analyzing ABC.com detailed that a viewer using MOVE’s Media-Player noticed “*continuous* playback—no noticeable buffering,” “Near-Immediate and *Continuous* Video Delivery,” and a dramatically improved viewing experience with both high-bandwidth and low-bandwidth connections. EX2022, 11; EX2122; EX2070, 2; EX2020 ¶¶11, 13. For the first time,

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viewers could enjoy streaming video content in a manner rivaling that of traditional cable and satellite delivery. *See, e.g.*, EX2070, 2. In 2010, one of PO's predecessors acquired MOVE—including the challenged patent—for \$45 million, and used the underlying technology and patent to launch Sling TV, one of the first streaming services for live television channels in the United States. EX2142; EX2020 ¶15; EX2100 ¶30; EX2023 (recognizing Sling TV as a “pioneer”).

Despite the ample objective evidence of non-obviousness here, which includes a prior finding of validity and infringement of the ABR Patents in a related proceeding discussed below at Section IV.A, Petitioner and its technical declarant, Dr. Houh, fail to even acknowledge this evidence in arguing that the challenged claims are obvious. *Cf.* Paper 1; EX1003; EX2141, ¶186.

**A. The ITC Credited the Same Evidence as Conclusively
Demonstrating Nexus and Objective Indicia for Nonobviousness
for the ABR Patents.**

Given the strength of the invention, including the very patent challenged here, the ABR Patents were found valid and infringed by the International Trade Commission in a Section 337 Investigation that Petitioner identified as a “related proceeding” (*See* Pet., 1-2) in a well-reasoned 271-page decision. EX1009. Specifically, the ITC relied on the same evidence presented below including Dr. Jeffay's claim charts to find that the evidence demonstrated nexus and that “*the objective evidence indicates a person of skill in the art at the time of the invention would not have found the invention to be obvious in view of those references.*”

EX1009, 213-17 (internal citations omitted); *see also* EX2007, 2 (adopting same); EX2141, ¶¶187, 191. The Respondents in that ITC Investigation, Peloton, lululemon, and MIRROR, each took a license to the ABR Patents with Peloton paying \$75 Million for a license including the patent challenged here. EX2141, ¶247.

B. The Streaming Products Offered by PO (and Predecessor MOVE) Embody the Claimed Invention.

“[A] patentee is entitled to a rebuttable presumption of nexus between the asserted evidence of objective indicia and a patent claim if the patentee shows that the asserted evidence is tied to a specific product and that the product ‘*is* the invention disclosed and claimed.’” *Fox Factory Inc. v. SRAM, LLC*, 944 F.3d 1366, 1373 (Fed. Cir. 2019). The coextensive requirement does not require a patentee to prove perfect correspondence between the product and a patent claim, but to “demonstrate that ‘the product is essentially the claimed invention.’” *Quanergy Sys., Inc. v. Velodyne Lidar USA, Inc.*, 24 F.4th 1406, 1417–18 (Fed. Cir. 2022) (citation omitted). Co-extensiveness “falls along a spectrum.” *Fox Factory*, 944 F.3d at 1373-74. MOVE’s contemporaneous documents show that MOVE’s Media-Player embodied, and was coextensive with, the Challenged Claims. *See* EX2141, ¶¶193-209; EX2022 (MOVE Tech Overview); EX2021 (Streaming Media Technology); *see also* EX2071. To this end, PO provides DISH’s and the ITC’s analysis showing how MOVE’s Media-Player and Sling TV embody MOVE’s patented ABR

technology, practices each limitation, and are coextensive with the challenged claims. EX2071 (Exemplary Claim Chart); *see also* EX1009 101-12 (ITC finding that Sling TV Apps practice claim 1 of the Challenged Patent). Dr. Jeffay provides his expert analysis of MOVE's Media-Player practicing an independent claim on an element-by-element basis and that it is co-extensive with the claimed invention. *See* EX2071; EX2141, ¶¶193-209; *cf. Echelon Fitness Multimedia, LLC v. Peloton Interactive, Inc.*, IPR2020-01541, Paper 54 at 50–64 (PTAB Mar. 2, 2022) (finding a patentee, relying on internal documents and expert testimony from Dr. Houh, the same expert for Petitioner, established patentee's product practiced each claim limitation and nexus existed to product's commercial success). Here, each of the critical features are claimed within the Challenged Claims and no critical unclaimed features remain; the MOVE Media Player is essentially the claimed invention. EX2141, ¶¶205. DISH is therefore entitled to a presumption of nexus. EX2141, ¶¶192-209, 209; EX2071; *see* EX1009, 101-12; *Fox Factory*, 944 F.3d at 1373; *Google LLC v. DDC Tech., LLC*, IPR2023-00709, Paper 76, at 38 (P.T.A.B. Nov. 4, 2024) (finding evidence of claim charts and testimony from named inventor was sufficient to find patentee was entitled to a presumption of nexus).

Even without a presumption of nexus, PO's voluminous evidence demonstrates that the objective indicia are the "direct result of the unique characteristics of the claimed invention." *Fox Factory*, 944 F.3d at 1373-74; EX1009, 212; EX2021; EX2141, ¶¶210-217. Critically, the evidence demonstrates

that the success of MOVE's Media-Player is directly tied to the claimed unique combination including the "continuous playback" feature. Industry participants praised the fluidity with which playback occurred: While "the Verizons of the world [were] installing fiber to deliver IPTV over a closed network," MOVE was focused on "improving what [it] call[ed] '*quality of experience*' for online media delivery over public networks." EX2048 (MOVE Quality Solution); EX2141, ¶216. "*The key*," one article writes, "*is in [MOVE's] plug-in*...Because it puts the end-user environment in control, it can determine the best end-user experience *intelligently...ensur[ing] fluidity of playback*." *Id.* EX2141, ¶216. Another news article explains that users praised MOVE's Media-Player as "especially impressive," and they tied this praise to the benefits offered by MOVE's Media-Player (e.g., HD video, instant-startup time, continuous playback, longer viewership, infrastructure scalability), and the combination of claimed features used to intelligently request and deliver the video content. *Cf.* EX2034; *see also* EX2048. EX2033 (Move a Next Gen. Content Dist. Platform); EX2069, 12. *Compare* EX2022 (discussing technical advantages of claimed features, including "continuous playback") *with* EX2039 ("Move-enabled streams will dynamically adapt...without buffering").

Moreover, as Dr. Jeffay further explains, the secondary considerations evidence is the direct result of the unique characteristics of the claimed invention in MOVE's Media-Player that led to high-quality video delivery, fast start-up times, less buffering, continuous playback, and "a dramatically improved viewing

experience for high-end and low-end connections” because it used ABR technology disclosed in the Challenged Patent. EX2141, ¶¶190, 213, 215, 265. With these features, MOVE’s Media-Player offered “a *smooth end user experience* as the Move Media-Player up-shift[ed] and down-shift[ed] in response to network and client CPU availability” to achieve continuous playback. EX2141, ¶¶194, 196, 201. A nexus analysis is not limited to only discussing novel features, but rather “the invention as a whole.” *Volvo Penta of the Americas, LLC v. Brunswick Corp.*, 81 F.4th 1202, 1212 (Fed. Cir. 2023).

MOVE’s success is the result of the unique characteristics of the claimed invention, and not the result of other parallel advances, such as improved bandwidth availability. *See* EX2041; *see also* EX2141, ¶¶210, 214, 221-222, 229, 236. In fact, e-mails from industry executives expressly dispel such a myth and explain the struggles other content providers suffered from despite having “enough bandwidth.” EX2041; *see also* EX2141, ¶¶210, 221-222, 229, 236. For example, a Senior Vice President from Level 3, after being impressed with MOVE’s Media-Player, questioned: “[t]here is enough bandwidth, but they cannot get the results you do.” EX2041. *Cf.* EX2048; EX2099, ¶¶ 8–11; EX2100, ¶ 29. Others, like BYU Broadcasting’s Manager of Business Intelligence, commented that the “stream using the MOVE Media Player was ‘definitely better than our Windows Media stream *by leaps and bounds*.’” EX2127 ¶ 4 (quoting EX2128 at 90:17-91:6); *see also* EX2141, ¶¶239. Indeed, MOVE was handling “more than a million full episode streams a

week and viewership [w]as doubl[ing] every month” and was delivering roughly as much data as YouTube “but more than the Web sites of CNN, NBC, and CBS.” EX2034; EX2141, ¶214. Each of these networks had access to parallel advances such as available bandwidth; no one could rival MOVE’s Media-Player.

The industry considered MOVE’s Media-Player as superior because it could “stream videos at an adaptive rate, which means the quality of the video depends on your CPU and bandwidth, as opposed to Flash videos that look the same no matter how good your resources are.” EX2141, ¶¶213-217; EX2051 (ABC Adds Full Screen Mode to Online Shows); *see also* EX2141, ¶¶235, 272; EX2052 (Move Article); EX2105 at 4 (“I am very happy to be off flash.”), 6 (“[MOVE] could really help Apple make the device a better streaming platform...They don’t have any provision for play listing, rich playback control, client side ad insertion, etc.”). As such, the Board should find a presumption of nexus or a direct connection between the evidence of secondary considerations and the unique characteristics of the claimed invention as specifically demonstrated under each category below.

C. Five Categories of Objective Evidence Support Non-Obviousness

1. Long-Felt but Unmet Need and Failure of Others

The patented ABR technology achieved success where others failed. EX2141, ¶¶218-229; *see also* EX2020, ¶¶6-28, 13; EX2099 ¶¶8-12. The claimed invention achieved continuous playback of streaming video when others could not. *See Apple*, 839 F.3d at 1053 (“it is reasonable to infer the need would not have persisted had

the solution been obvious.”). In this regard, “longfelt need is closely related to the failure of others.” *In re Cyclobenzaprine Hydrochloride Extended-Release Capsule Patent Litig.*, 676 F.3d 1063, 1082-83 (Fed. Cir. 2012). “Evidence is particularly probative of obviousness when it demonstrates **both** that a demand existed for the patented invention, and that others tried but failed to satisfy that demand.” *Id.* That is the case here, including with Petitioner’s primary reference—Leaning.

Leaning is one of British Telecom’s (“BT”) Patent Cooperation Treaty (“PCT”) publications. EX1004, 1. Notably, the Chief IP counsel for BT, Peter Ratcliffe, has confirmed after a reasonable search that BT had no records that the video aspects of Leaning were ever commercialized or that the Leaning reference has been specifically licensed. *See* EX2126 ¶¶10-11; *see infra* §IV.H. *See also* EX2141, ¶225. If Leaning had already solved the problem of continuous playback of video, as Petitioner argues, it stands to reason that BT would have some evidence that it commercialized that approach and received the success and praise that MOVE eventually did. The fact that no records show BT ever commercialized the invention is highly probative evidence of non-obviousness, particularly when compared to the high praise received by MOVE’s Media-Player.

Before the introduction of MOVE’s Media-Player claimed in the challenged patent, the quality, fluidity, and reliability of streaming video technology was inferior to that of traditional television. EX2141, ¶¶219, 221, 224, 227, 229; EX2020, ¶¶ 6-10, 12. The resulting need for a way to watch TV shows (nearly

30 minutes or an hour in length) and movies (one to two hours in length) in higher quality over the Internet was unmet because prior attempts suffered from buffering, hesitancy, delays, stalling, freezing, and unresponsiveness. EX2141, ¶¶223-224. *See generally* EX2020 ¶11; EX2021; EX2034. There was a clear need for continuous playback of the content, and the lack thereof resulted in little to no video streaming over the Internet. *Cf.* EX2034. Users often gave up after prolonged waiting or unresponsiveness. *E.g.*, EX2141, ¶¶220, 223. The length of an average video streaming session was limited to only a few minutes. *See, e.g.*, EX2034 (Better than YouTube) (“3 or 4 minutes”); EX2035, 1 (“under three minutes”); EX2036, 2 (“close[] to three minutes”); EX2141, ¶¶220, 247. Another study of Internet video streams at the time concluded more than half of “viewers were frustrated with the experience,” “have an immediate fatal error,” and experience rebuffering that interrupts the video. EX2077, 1.

Faced with “consumer’s real, pent-up demand for HD content,” EX2037, the industry recognized that “whoever can solve or bypass these problems [with network bottlenecks and slow connection speeds at people’s homes] will become adopted by more video sites as the demand for HD video continues to rise.” EX2058; EX2141, ¶220. Ultimately, it was the claimed ABR technology that the industry first deemed “good enough” to do what “many in Hollywood and Silicon Valley have so far been unable to do: take Internet video from its YouTube origins to a full-fledged television service with dozens of channels” that rivaled the uninterrupted experience

typical of cable, satellite, and terrestrial television. EX2038 (*WSJ Pushing to Bring TV to the Internet* article, which specifically links MOVE's advantage to the combination of MOVE's claimed features that provide continuous playback of the content including for "broadcast-quality video via the Web, in Internet protocol data packets"); EX2141, ¶220. The evidence demonstrates how MOVE's Media-Player achieved continuous playback, using streamlets which addressed the industry's long-felt need.

The president of Level 3's Content Markets Group, one of the largest industry content delivery network providers, called MOVE's Media-Player "a significant technology enhancement -- a true step forward -- in the delivery of HD content over the Internet" because of the continuous playback of the content. EX2039; EX2141, ¶¶217, 226, 259, 274. The technology was considered "groundbreaking" because, as noted in 2008 for the ESPN 360 online video player powered by MOVE, it would provide "a better live video experience for fans than that currently offered by any other service," such that even "a slow wireless connection" could "get a relatively good looking picture and more importantly, and entirely fluid stream." EX2040; *see also* EX2039 (explaining how MOVE's claimed ABR technology provides a "graceful transition – up and down – that most users will not even notice"); EX2141, ¶251. Thus, MOVE's Media-Player was able to achieve what others in the industry couldn't—continuous playback of content without buffering or freezing of content. EX2141, ¶223-227, 232. Thus, there is a direct nexus for this evidence and

comments from Level 3 to the unique characteristics of the claimed invention that allowed MOVE's Media-Player to smoothly shift between bitrates while still providing continuous playback. *See WBIP LLC*, 829 F.3d at 1331 (“the claimed combination as a whole [can] serve[] as a nexus for the objective evidence” and “proof of nexus is not limited to only when objective evidence is tied to the supposedly ‘new’ feature(s)”).

Competing technologies attempted but failed to meet this same need for the combination of claim elements to achieve continuous playback using streamlets. EX2020 ¶¶7-10; EX2141, ¶¶225-229; EX2034; EX2036; EX2041; EX2103; EX2033; EX2084; EX2053. These inferior technologies often required infrastructure that was expensive, in both cost and bandwidth consumption, even with higher bandwidth available. EX2141, ¶¶221, 229; EX2020, ¶7. But no competing technology could achieve the same quality experience provided by MOVE's Media-Player with the patented ABR technology, including continuous playback. EX2141, ¶¶222, 223, 226; EX2020, ¶23. For example, after a demonstration of MOVE's Media-Player to Level 3, a senior vice president at Level 3 asked MOVE personnel “why are the current streaming protocols broken,” further commenting that “[t]here is enough bandwidth but they cannot get the results you [MOVE] do.” EX2041; EX2141, ¶229. Bloggers also “raved” about MOVE's Media-Player and its ability to remove the “technical barriers to delivering online HDTV.” EX2045; EX2043.

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After “adaptive bitrate streaming [was] brought to the fore by MOVE,” companies quickly adopted the technology at the expense of abandoning prior approaches. EX2046; EX2036, 2; EX2062; EX2141, ¶¶227, 265. For example, ABC.com abandoned its previous commitment to Adobe Flash in favor of integrating the claimed ABR technology into its website for continuous playback of its content. EX2044; EX2141, ¶¶234-235. And Microsoft, despite investing heavily in sophisticated streaming solutions for years, not only integrated MOVE’s ABR technology into its Silverlight product, it also asked to license the technology disclosed in the provisional application to which this very patent family claims priority. EX2125; EX2042; EX2043; EX2141, ¶¶227-228. Additionally, after being shown MOVE’s Media-Player under non-disclosure agreement (“NDA”), Apple declined to enter a business relationship with MOVE yet subsequently developed the HLS Standard, which is “very similar to what MOVE had developed and was using as a proposed standard.” EX2100 ¶¶20-27; EX2102, 113:5-9, 138:13-18; 155:1-15; 156:6-15; EX2073, 38:20-40:7; *E.g.*, EX1009 at 80-99, 114-126 (concluding that use of HLS standard for ABR streaming infringes two of PO’s ABR Patents—the ’564 and ’156 Patents). If there were no long felt and unmet need to solve the issues of latency, reliability, and buffering, then these giants would not have invested in MOVE’s technology so heavily, developed their own competing ABR technologies using MOVE’s as a model, or sought to standardize their solutions across their devices.

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While companies like ABC and Microsoft transitioned to the claimed ABR technology despite having dedicated substantial time and resources to the developing of their own technologies, others gave up altogether. *See* EX2141, ¶223. For example, each of AOL and CBS tried and failed to develop a streaming solution. *Id.*; *see also* EX2047. Unlike the continuous playback achieved by the claimed invention, RealNetworks broadcasts were said to be “too choppy and too fuzzy, with a viewing window far too small to enjoy.” EX2103 (Baseball Tests Online Broadcasts, NY Times).

Changes in customer usage patterns further demonstrates MOVE's fulfilment of the previously unmet need for high-quality streaming (and nexus to the claimed invention). EX2141, ¶¶220; EX2074. Following the adoption of the claimed ABR technology, users began spending nearly an hour per session streaming content, as opposed to the few minutes spent previously. EX2141, ¶¶220, 222, 246; EX2036, 2 (“more than 50 minutes”); EX2035, 1 (“more than 50 minutes”); *see also* EX2034 (“22 minutes a session, compared with 3 or 4 minutes” previously); EX2048 (“It also means people watch longer.”). In other words, MOVE proved that, “if you offer Internet viewers high quality, full-screen video content, they might sit still and watch an hourlong program.” EX2036, 2; EX2141, ¶246. This evidence is predicated upon the Challenged Patent's novel solution of adaptively shifting bitrates while ensuring continuous playback of streamlets, and thus is directly tied to the claimed features. *See, e.g.*, EX2036; EX2077 (describing MOVE's Media-Player as providing “a

continuous, high-quality stream unattainable with competing technologies” and a player that “exceeds any other platform.”) EX2077, 1-2.

2. Surprising Results

MOVE's Media-Player achieved what many thought impossible and contributed to a major shift in the industry away from cable/satellite packages to internet streaming (*i.e.*, cord-cutting). *See generally* EX2141, ¶¶230-237. *See also* EX2032; EX2037. Indeed, users of MOVE's Media-Player embodying the claimed ABR technology expressed a substantial amount of surprise when they first experienced MOVE's Media-Player. EX2141, ¶¶232-233; EX2032, 1 (describing ABC.com's implementation of MOVE's product as “shockingly good” and “spectacular”); EX2044. One user, who previously “thought we would be waiting years to see viable streaming HD technology,” stated he “was a bit shocked to . . . find [the show] Lost streaming across a” flat-screen computer monitor in crisp, clear glory using MOVE's Media-Player, and that he couldn't “remember the last time that technology actually surprised [him] by arriving before [he] expected it.” EX2037; EX2141, ¶233. This evidence has a direct nexus to the continuous playback requirement of the Challenged Claims. EX2141, ¶230.

MOVE's Media-Player also was recognized as superior when compared to other streaming technologies at the time because of the continuous playback it provided. EX2141, ¶¶230, 234-237. For example, commentators observed that ABC's online player “clearly deliver[ed] a better, sharper picture” than NBC's

player, which “clearly doesn’t come close to the quality that ABC is offering” because NBC “relies on Adobe’s Flash to stream their video.” EX2141, ¶234; *see also* EX2049 (ABC Becomes First Network HD Streamer). Furthermore, ABC’s online player was called “[o]ne of the most spectacular” because it relied on MOVE’s ABR technology, which breaks the video up into “streamlets” to achieve a higher quality picture and continuous playback. EX2082 (ABC.com Streamlettes); EX2053 (“Kudos to ABC for being a frontrunner in providing quality content to their customers”). This evidence also has a direct nexus to the continuous playback requirement of the Challenged Claims.

3. Commercial Success

The unique combination of claimed features embodied in the MOVE Media-Player led to its commercial success. *See, e.g.*, EX2141, ¶¶214, 238-263. For example, by providing continuous playback and smooth shifting between bitrates, MOVE’s Media-Player provided “the best streaming experience possible” and is credited as the main reason ABC switched to that player. EX2050.

Within months of its 2006 commercial launch, MOVE’s Media-Player was being used to deliver roughly as much data as YouTube and more data than the web sites of CNN, NBC, and CBS, none of which used the MOVE Media-Player. *See* EX2141, ¶¶214, 224, 235, 241, 272; EX2034. MOVE was handling “more than a million full episode streams a week” with a sustained “viewership [that] [w]as doubl[ing] every month.” EX2034; EX2141, ¶¶241, 242. As a result, the number of

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times the shows had been streamed had risen to more than 34 million by March 2008 and users were averaging 50 minutes or more per session. EX2035. This evidence directly demonstrates the claimed “continuous playback” as the reason for the success of MOVE’s Media-Player.

The commercial success of the claimed ABR technology is also demonstrated by the number of companies that adopted the technology after it was made commercially available. *See generally* EX2141, ¶¶242, 244, 251, 255, 258, 260-261. In addition to ABC’s switching from Adobe Flash to MOVE’s Media-Player and Microsoft’s integrating the patented ABR technology into its existing Silverlight product, as discussed *supra* at §IV.B, other leading content providers also adopted the patented ABR technology after its commercial release, including Fox, Level 3, and ESPN. EX2141, ¶¶242-247, 250-251, 260. MOVE’s customer-base then quickly expanded to include numerous other content providers, including the Oprah Book Club, Televisa, the CW, Comcast, and ProSieben. EX2141, ¶¶258-261; EX2024 (MOVE Awarded Fundamental Patent). As a result, MOVE’s “customers include[d] some of the largest media companies in the world.” EX2055 (Microsoft Unlocks the Power of the Web), 2. This evidence has a direct nexus to the “continuous playback” claimed, because the success depended on MOVE’s solution that allowed fluid, uninterrupted playback using streamlets.

The commercial success of the claimed ABR technology is further demonstrated by its success attracting investors in the technology. EX2141, ¶258;

EX2057. In addition to a “strategic alliance” with Level 3 in June 2007, Microsoft took an equity stake in MOVE in August 2008, adding to MOVE’s previous funding of nearly \$70 million from Cisco, Comcast Interactive Media, Disney, and others. EX2070; EX2141, ¶¶257-258; EX2086. Microsoft recognized MOVE as the “leader in HTTP-based video delivery” because of MOVE’s “adaptive streaming technology that seamlessly adjusts image quality to fit available bandwidth on each viewer’s Internet connection” to achieve continuous playback. EX2070, EX2141, ¶257; EX2059; EX2060. And Microsoft specified that collaborating with MOVE would give it a “competitive edge in a crowded marketplace.” EX2055, 4. All this demonstrates that Microsoft sought to expand the distribution of its own product by piggybacking on MOVE’s innovations and resulting success. This evidence has a direct nexus to the continuous playback requirement of the challenged claims.

When MOVE announced the award of the first patent in the family of the ABR Patents, the industry noted that “MOVE Networks just got a lot more valuable on the intellectual property front.” EX2062; EX2024; EX2141, ¶266. That same article recognized that “[t]he awarding of the patent ... could pose a threat to Adobe, Microsoft, and Apple and many other companies that have rolled out adaptive streaming technology of their own.” EX2062, 1. Shortly after in October 2010, Microsoft solicited a license to MOVE’s ABR technology covered by the ’783 Application, which includes the same disclosure as the challenged ABR Patents and

which ultimately issued as the '772 Patent. EX2125 (Microsoft ITC Decl.), ¶4; *see also* EX2141, ¶262. MOVE declined to grant the license. EX2125 ¶4.

MOVE and the ABR Patents were subsequently acquired by PO's predecessor and used to create Sling TV, a successful Internet streaming television platform. EX2142; EX2020 ¶15; EX2141, ¶263. DISH has since licensed the ABR patents to ViacomCBS, Univision Communications, Peloton, lululemon, iFit, and others. EX2063 at 23 n.100, EX2093; EX2094; EX2095; EX2141, ¶260. This type of licensing activity also favors a finding of nonobviousness. *Metabolite Lab 'ys, Inc. v. Lab 'y Corp. of Am. Holdings*, 370 F.3d 1354, 1368 (Fed. Cir. 2004).

4. Copying

The objective evidence suggests that competitors adopted MOVE's patented ABR technology. *See generally* EX2141, ¶¶264-269. Copying, particularly by competitors, can indicate non-obviousness. *WBIP, LLC*, 829 F.3d 1317 at 1336 (Fed. Cir. 2016). "Evidence of access and substantial similarity is evidence of copying." *Medtronic, Inc. v. Teleflex Innovations S.a.r.l.*, 70 F.4th 1331, 1340 (Fed. Cir. 2023). MOVE disclosed its ABR technology to Apple in 2006 under multiple NDAs. EX2141, ¶¶266-267; EX2065; EX2066. Although Apple declined to enter a business relationship with MOVE, it subsequently embraced adaptive bitrate streaming and developed the HLS Standard, which the ITC found is "very similar to what MOVE had developed and was using as a proposed standard." EX2073, 38:20-40:7 EX2100 ¶¶20-27; EX2102, 113:5-9, 138:13-18; 155:1-15; 156:6-15; EX2046. The HLS

Standard published by Apple states in its introduction that “HTTP Live Streaming provides a reliable, cost-effective means of delivering *continuous* and long-form video over the Internet” and “[u]sing this protocol, a client can receive a *continuous* stream of media.” EX2131, 4; EX2141, ¶267.

Similarly, Microsoft decided to implement its own version of HTTP-based ABR streaming technology, called “Smooth Streaming,” shortly after its collaborations with MOVE and gaining access to the patented ABR technology. EX2067 (Email 2.23.09); EX2042 (Email 6.16.07); EX2043 (Email 11.26.07); EX2141, ¶268.

Both Apple and Microsoft pitched their ABR technologies as providing nearly the exact same benefits as MOVE’s Media-Player. EX2141¶¶266-269; EX2077 (Email 2.23.09); EX2056 (The Lowdown on Apple); EX2062.

5. Industry Praise and Peer Recognition

Industry praise is evidence of nonobviousness because “[i]ndustry participants, especially competitors, are not likely to praise an obvious advance over the known art.” *Apple Inc. v. Samsung Elecs. Co., Ltd.*, 839 F.3d 1034, 1053 (Fed. Cir. 2016) (en banc). The industry praised MOVE’s patented approach of using an intelligent client that “determine[d] the best end-user experience intelligently.” EX2048. *See generally* EX2141, ¶¶270-281. When users praised MOVE’s Media-Player as being “especially impressive,” they tied this praise to the combination of claimed features, which smoothly shifted between bitrates and provided fluid,

uninterrupted playback. EX2033 (Move a Next Gen. Content Dist Platform). EX2141, ¶271. Those in the industry also recognized that “MOVE delivers its video as a standard web object that’s cached in small bits—making its service *infinitely more ISP-friendly* than traditional streaming technology. MOVE also doesn’t use special media servers and adjusts the video quality based on available bandwidth. This means *no buffering, no stalling*.” EX2036, 2; EX2141, ¶¶272-273. Indeed, MOVE was considered to be “at the forefront” of Internet streaming due to its patented approach to “break[ing] up the video into bits” and providing continuous playback. EX2034; EX2050.

Similarly, the industry recognized MOVE’s Media-Player as superior because it would “stream videos at an adaptive rate...” and provide continuous playback. EX2051; *see also* EX2141, ¶271. This praise is directly tied to the claimed features of the patented ABR technology to smoothly shift rates and provide continuous playback. *See generally* EX2141, ¶¶271-280.

In addition to the praise noted above, MOVE’s Media-Player using the claimed technology to achieve continuous playback also received numerous awards in the highly competitive streaming industry, including awards from AlwaysOn’s OnHollywood 100, OnMedia 100, Red Herring 100, Red Herring Global 100, and TechCrunchies. EX2010, ¶34; EX2141, ¶¶278-280. Each of these awards emphasized the “innovation” of MOVE’s Media-Player, which was praised for

delivering “the highest quality content and a preeminent viewing experience of online television,” linking directly to the continuous playback. EX2141, ¶278.

More recently, Sling TV, which implemented the patented ABR technology after the MOVE acquisition, was recognized as a “pioneer in adaptive bitrate streaming” and received “the Technology & Engineering Emmy Award” in the category of “Pioneering Development of Large Scale, Cloud Served, Broadcast Quality, Linear Channel Transmission” at the Technology & Engineering Emmy Awards on April 19, 2020. EX2141, ¶280; EX2020, ¶21; EX2023; EX2100 ¶21; EX2127 ¶21. Sling TV provides continuous playback of content, including live and on-demand broadcasts. EX1009, 101-12.

Content distributors and competitors also praised the patented ABR technology. *See* EX2141, ¶¶275-275. Level 3 praised MOVE’s Media-Player as a “significant technology enhancement ... in the delivery of HD content over the Internet.” EX2054 (Level 3 Streams and Other News). Level 3 in a Letter and Term Sheet to MOVE’s then-CEO John Edwards praised the difference between “traditional streaming” and using Flash, due to the ability of MOVE’s Media-Player to “automatically upshift[] and downshift[] to provide *continuous video playback* at the highest-quality profile possible.” EX2130; EX2041.

Similarly, Microsoft praised the patented ABR technology as “the highest-quality viewing experience available online—driving online revenue and a competitive edge in a crowded marketplace.” EX2055, 4; EX2141, ¶276. Microsoft

described the technology as “an adaptive streaming technology that seamlessly adjusts image quality to continuously fit available bandwidth on each viewer’s Internet connection.” EX2070, 4; EX2141, ¶276.

In addition, Tony Rallo, then-vice president of Technology Strategy for Televisa, stated: “Not only is MOVE’s technology superior to others we have used, but their ability to manage large scale setup and operations with flawless delivery is unmatched.” EX2052; EX2141, ¶277. The reference to flawless delivery again has a direct nexus to the “continuous playback” limitation of the Challenged Claims. This overwhelming evidence of industry praise for the claimed inventions weighs against an assertion that the same claimed invention would have been obvious. *Power-One, Inc. v. Artesyn Techs., Inc.*, 599 F.3d 1343, 1352 (Fed. Cir. 2010) (finding praise from a competitor tends to indicate the invention would not have been obvious).

Further, users praised the player for its “bottom-line technology advantage” of being “profoundly more efficient and less expensive,” and providing “a dramatically better viewing experience.” EX2036; EX2141, ¶¶273, 275. The viewing experience has a direct nexus-in-fact to the continuous playback requirement of the claims achieved by MOVE’s Media-Player.

D. British Telecom’s Failure to Commercialize Leaning’s Teachings Further Demonstrates Nonobviousness

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In contrast to the ample evidence of MOVE's revolutionary success, *see supra* §IV.C.1-5, the most direct and probative indicium of non-obviousness may be BT's failure to commercialize, license, or further develop the video teachings of Leaning, despite having had every incentive to do so in the early 2000s. *See* EX2135; EX1004, 1 (listing BT as Leaning's "Applicant").

As BT's Chief IP counsel, Peter Ratcliffe, explains in Exhibit 2126, "BT is one of the world's oldest telecommunications companies." EX2126 ¶4. "[D]ue to BT's significance in world history, BT has built [the BT Archives], an archive of records extensively documenting its research, development, history, and commercialization," and the BT archives include records such as minutes, advertising materials, photographs, and major collections of the company's history. *Id.* Despite BT's extensive record keeping protocols, Mr. Ratcliffe confirmed that he not only failed to "find any BT business record indicating that video implementation of [Leaning] (shown at pages 20-22) was ever licensed or commercialised," but Mr. Ratcliffe ***also confirmed with the Leaning inventors' direct manager that the video teachings were never commercialized.*** *Id.* ¶8. Thus, even though BT had every incentive to commercialize and develop an ABR streaming solution, BT's failure to commercialize the video aspects of Leaning demonstrates that Leaning falls short of rendering the challenged claims obvious.

V. CONCLUSION

For the foregoing reasons, Patent Owner respectfully requests the Board

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uphold the validity of the challenged claims of U.S. Patent No. 9,407,564.

Respectfully Submitted,

February 28, 2025

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CERTIFICATE OF SERVICE

Pursuant to 37 C.F.R. §§ 42.6(e), we certify that an electronic copy of the foregoing **PATENT OWNER'S RESPONSE** along with any accompanying exhibits was served on Petitioner's counsel of record at the following address:

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CERTIFICATION UNDER 37 C.F.R. § 42.24(d)

Pursuant to 37 C.F.R. § 42.24(d), the undersigned hereby certifies that the word count under §42.24(b)(1) for the foregoing Patent Owner Response to the Petition for *Inter Partes* Review totals 13,975 words, within the 14,000 word limit allowed under § 42.24(a)(1)(i).

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