Patent Owner's Presentation

fuboTV Media Inc. and Yanka Industries, Inc.

v.

DISH Technologies L.L.C.

IPR2024-00917 (U.S. Patent No. 10,757,156)
IPR2024-00918 (U.S. Patent No. 9,407,564)*
IPR2024-00919 (U.S. Patent No. 8,868,772)*

Patent Trial and Appeal Board
August 22, 2025

* WebGroup Czech Republic, a.s. and NKL Associates, s.r.o. filed petitions in IPR2025-00347 and -00348 and have been joined as parties to IPR2014-00918 and -00919, respectively.

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I. Summary

- IPR2024-00917 (U.S. Patent No. 10,757,156)
- IPR2024-00918 (U.S. Patent No. 9,407,564)
- IPR2024-00919 (U.S. Patent No. 8,868,772)

Summary of Arguments

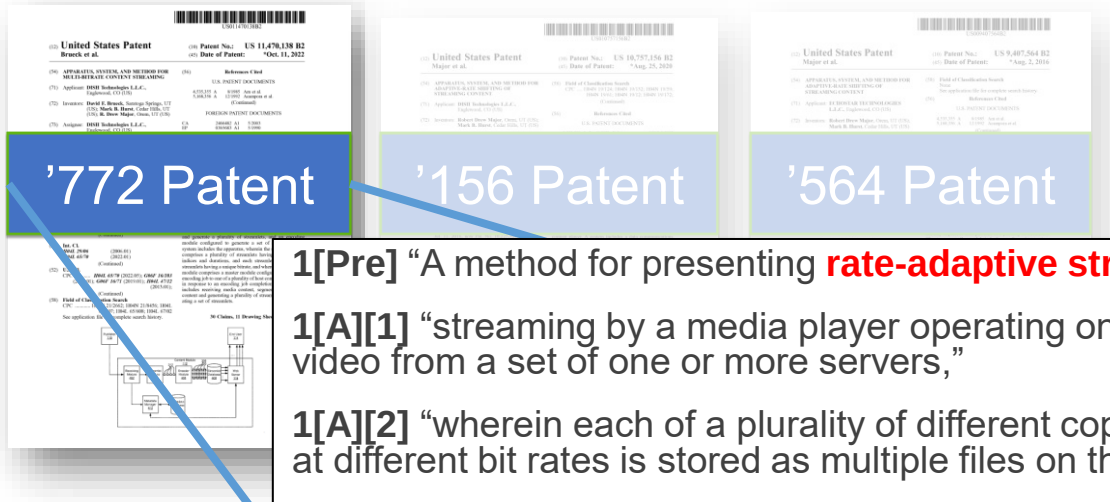
- **Leaning Fails to Disclose or Suggest "Continuous Playback"**
  - Each Challenged Claim Recites "shift … to achieve continuous playback."
  - Leaning discloses streaming content where playback is interrupted at each and every shift. Leaning does not disclose or suggest any embodiment with continuous video playback.
  - The Petition mapped directly to Leaning's "clear buffer" flowchart with interrupted playback and without any modifications.
- **Untimely Arguments Raised in Reply** – Petitioner's raises untimely claim construction and obviousness theories on "continuous playback"
  - Four new obviousness modifications to Leaning.
  - Regardless of timing, these theories still fail.

Summary of Grounds

- **Obviousness** – Petitioner challenges all claims under §103 relying on **Leaning**
  - Substantially the same Leaning-based single-reference obviousness challenge to independent claims across all three cases
  - Secondary references for certain dependent claims
    - **'564 and '772 Patents (IPR2024-00918 and -00919)** – Petitioner adds **Gamble** in combination with Leaning to allegedly show dependent claim limitations reciting requesting "sub-parts" of files/streamlets over different TCP connections
    - **'156 Patent (IPR2024-00917)** – Petitioner adds **Ala-Honkola** in combination with Leaning to allegedly show requesting streamlets via "multiple" TCP connections
- **Objective Indicia** – Petitioner never addresses DISH's overwhelming objective evidence of nonobviousness except that it lacks a "nexus" with the Challenged Claims

Summary of Challenged Claims

- Each Challenged Claim requires shifting playback quality to achieve "continuous playback" of the video



1[Pre] "A method for presenting **rate-adaptive streams**…"

1[A][1] "streaming by a media player operating on an end user station a video from a set of one or more servers,"

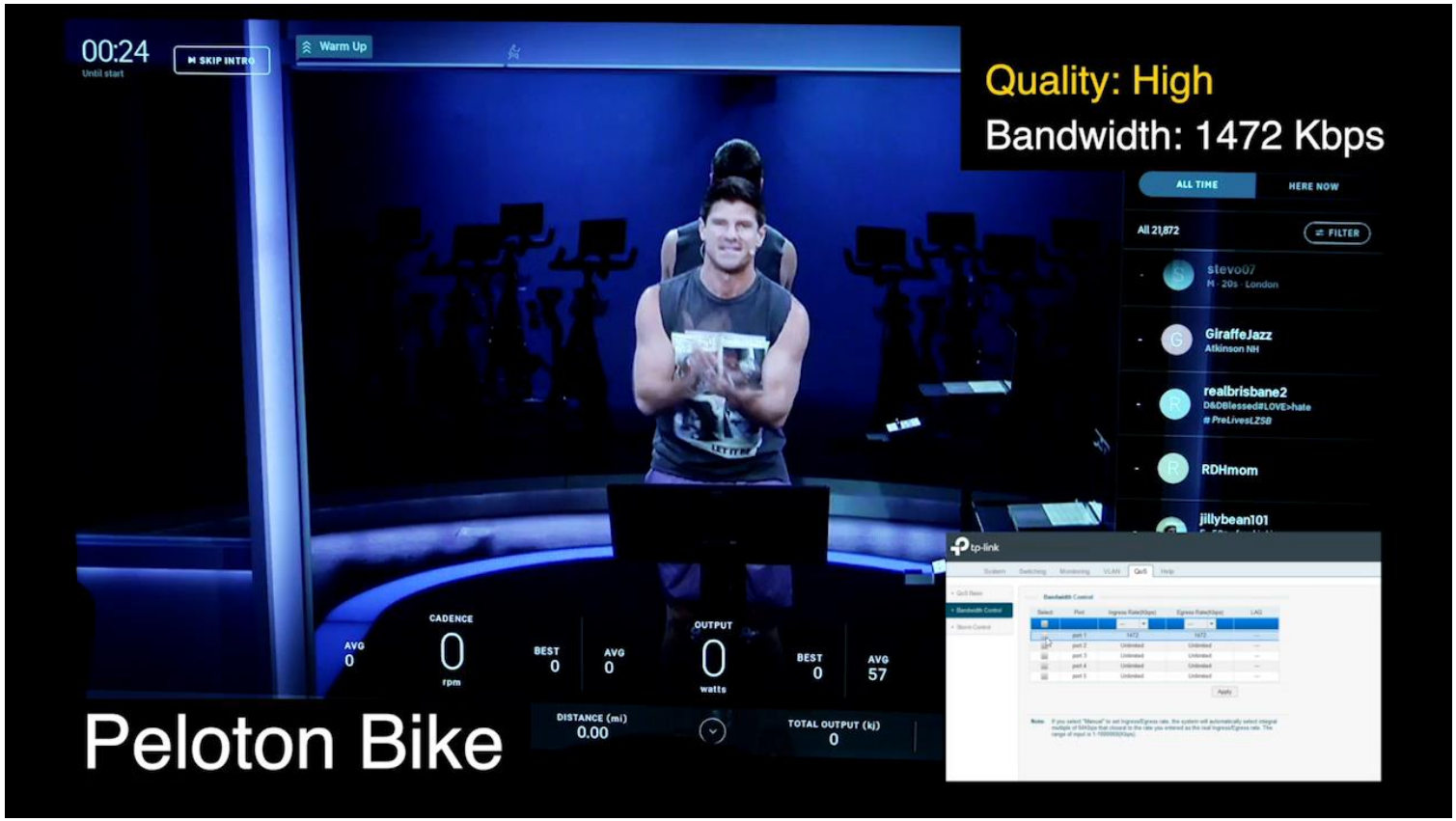
1[A][2] "wherein each of a plurality of different copies of the video encoded at different bit rates is stored as multiple files on the set of servers"

1[D] "repeatedly generating a set of one or more factors indicative of the current ability to sustain the streaming of the video using the files from different ones of the copies, …"

1[E] "making the successive determinations to shift the playback quality based on at least one of the set of factors **to achieve continuous playback of the video** using the files of the highest quality one of the copies determined sustainable at that time…"

II. Overview of DISH's ABR Technology Recited by the Challenged Claims

ABR in “Continuous” Operation

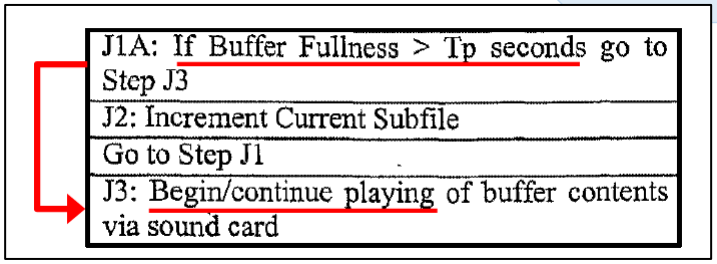


EX2018

III. Overview of Asserted Prior Art

WO 2002/049343 ("Leaning")

- Leaning is not directed to continuous playback or display.
- Every embodiment disclosed in Leaning stops playback at each rate shift and only resumes playback once a threshold is reached.
- Leaning delivers primarily MP3 audio.
- Leaning acknowledges that the techniques required for video are "more complex" with "further implications" than audio.



EX1004 at 10 (annotations added); '772 POR at 16-17; EX2141, ¶ 48

The delivery of video recordings does however have further implications for file partitioning if switching or jumps are to be permitted. In the case of recordings where each frame of a picture is coded independently, it is sufficient that a sub-file contains a whole number of frames of a picture. If compression involving inter-frame techniques is in use, however, the situation is more complex. Some such systems (for example the MPEG standards) generate a mixture of independently coded frames ("intra-frames") and predictively coded frames; in this case each sub-file should preferably begin with an intra-frame.

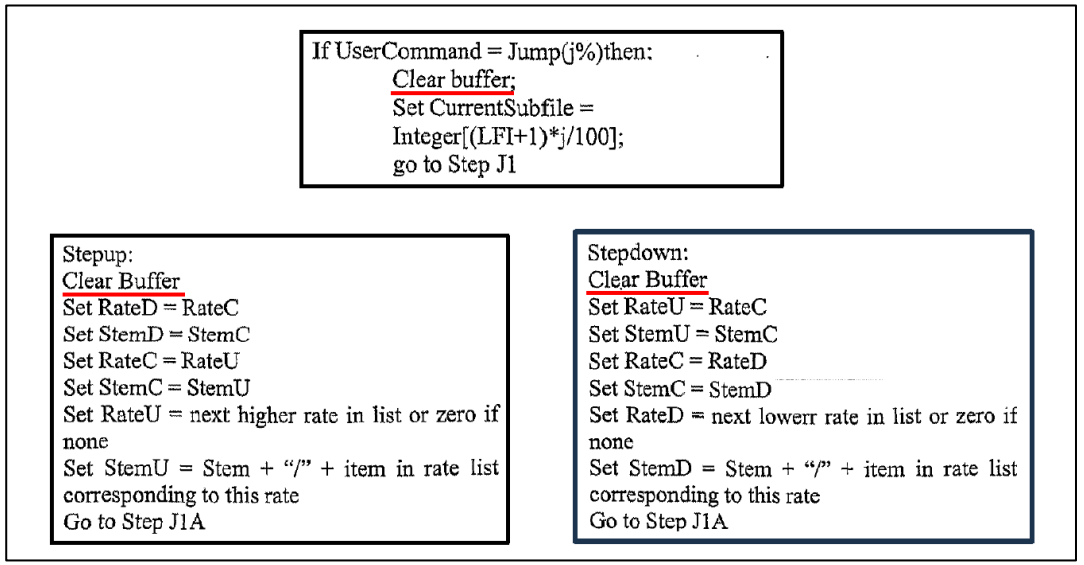
In the case of inter-frame coding systems such as the ITU H.261 standard, which do not provide for the frequent, regular inclusion of intra-frames, this is not possible. This is because – taking rate-switching as an example, if one were to request sub-file n of a higher bit rate recording followed by sub-file n+1 of a lower bit-rate recording, the first frame of the lower bit-rate sub-file would have been coded on an inter-frame basis using the last decoded frame of sub-file n of the lower rate recording, which of course the terminal does not have at its disposal – it has the last decoded frame of sub-file n of the higher rate recording. Thus serious mistracking of the decoder would occur.

EX1004 at 16:17-31 (annotations added); '772 POR at 8; EX2141, ¶ 67

'772 POR at 8, 13-14, 16-17; EX2141 (Jeffay Declaration), ¶¶ 42, 47-48, 67; EX1004 (Leaning) at 1:3-4, 9-11, 16:6-31; EX1001 ('772 Patent) at 1:64-2:5.

Leaning "Clear Buffer" Teachings

- Every time Leaning performs a rate shift (e.g., "Stepup" or "Stepdown") or "jump," Leaning discloses that the buffer is cleared.
- 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."
- Leaning's solution prefers "to suspend decoding and clear the buffer so that the new request [for a sub-file] is sent immediately."

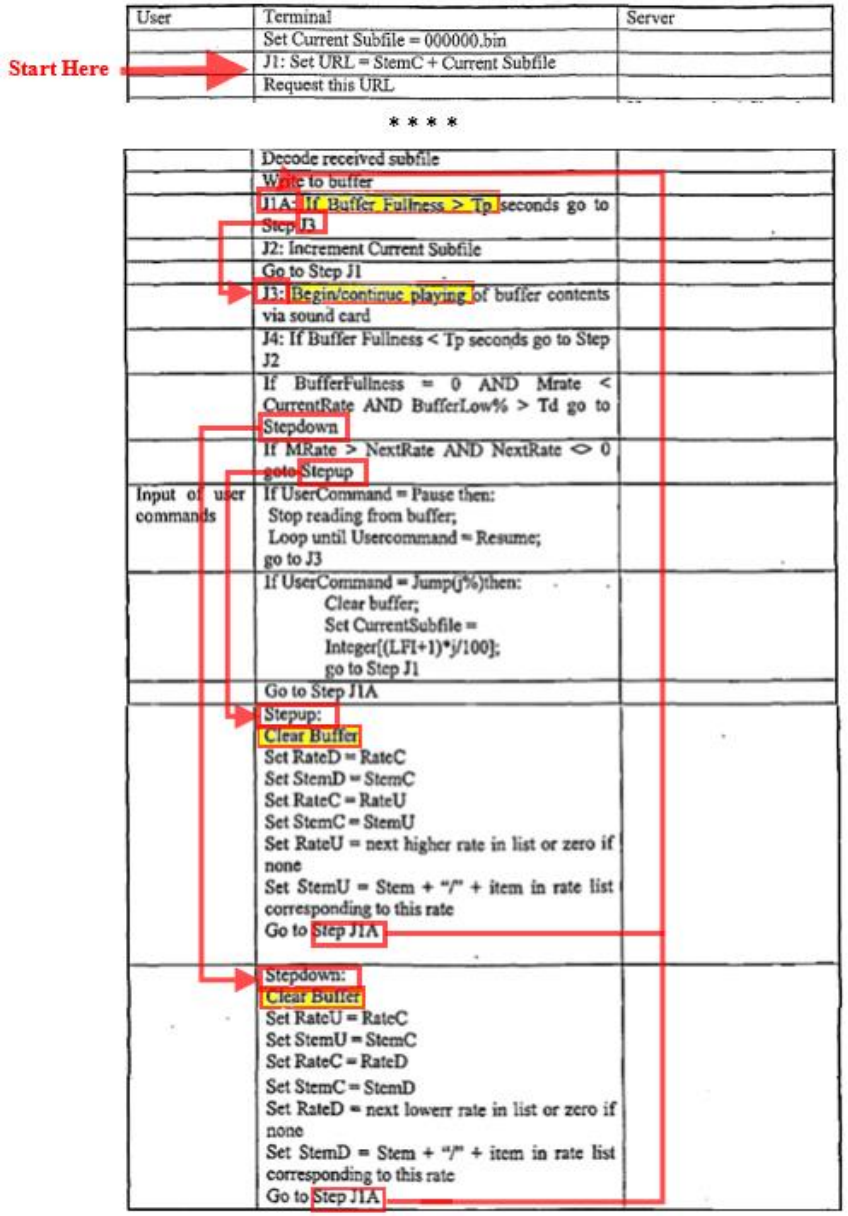


EX1004 (Leaning), at 10-11 (annotations added); EX2141 (Jeffay Declaration), ¶ 49; '772 POR at 17-18; '772 Sur-Reply at 11-13

'772 POR at 17-20, 24-27; EX2141 (Jeffay Declaration), ¶¶42, 47-50; EX1004 (Leaning) at 1:3-4, 2:5-7, 8:20-23, 11:19-20; EX1001 ('772 Patent) at 1:64-2:5.

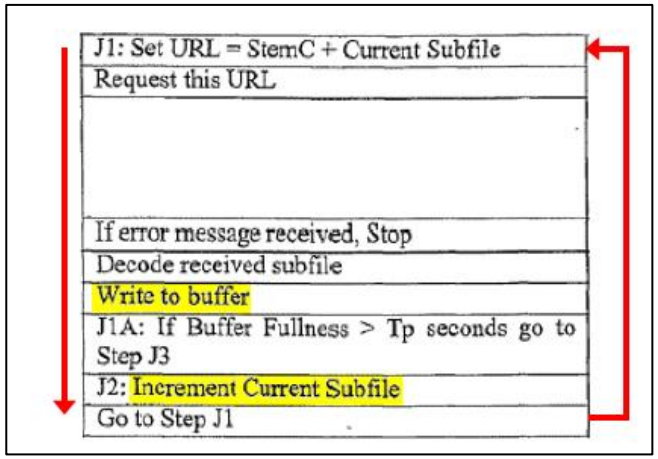
Leaning's "Clear Buffer" Causes Temporal Discontinuity

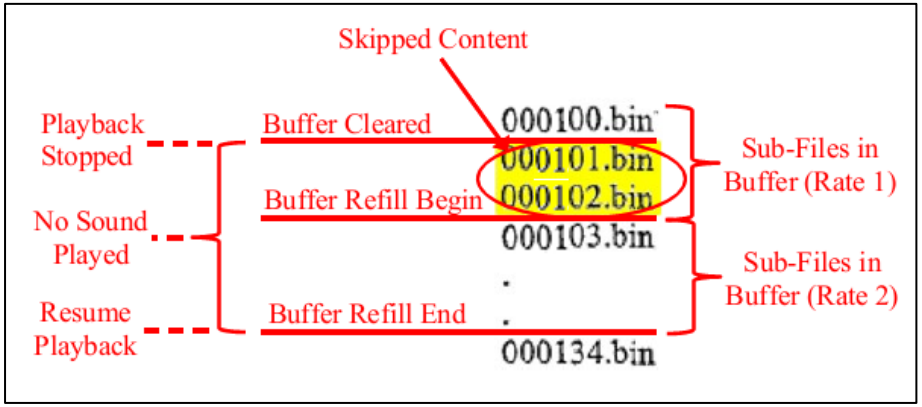
EX1004 at 10-11 (annotations and highlighting added); '772 POR at 19; EX2141 (Jeffay Declaration), ¶ 50



Leaning's "Clear Buffer" Causes Discontinuity in the Content

- In addition to clearing its buffer, Leaning increments the sub-file number sequentially every time a subfile is written to the buffer.
- Leaning does not account for the buffer being cleared.
- Leaning would upshift (Stepup) after requesting subfile "000102.bin" and playback would resume at sub-file "000103.bin" after the buffer refills, but before sub-files "000101.bin" and "000102.bin" are played back.





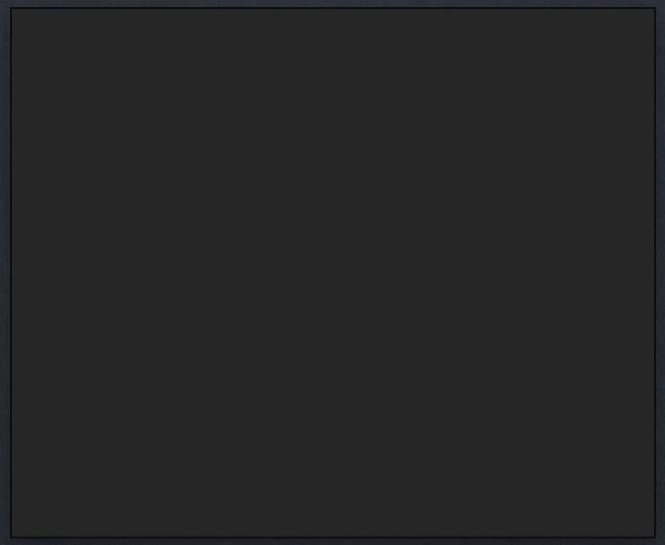
'772 POR at 20-22; EX1004 at 3:12-18, 10 (annotations added); EX2141 (Jeffay Declaration), ¶ 79

Leaning's Temporal and Content-Based Discontinuities

J1: Set URL = StemC + Current Subfile
Request this URL
* * *
If error message received, Stop
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

Stepup: Clear Buffer * * * 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 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

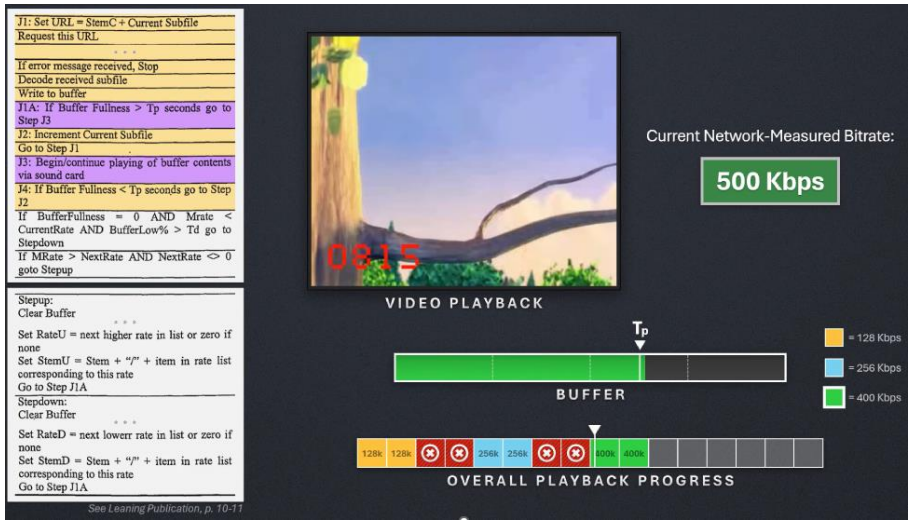
See Leaning Publication, p. 10-11



EX2133; '772 POR at 22, n.6; EX2141, ¶ 79, n.6

Leaning's Express Interruptions

Leaning's Playback is Interrupted



Screenshot of EX2133 at 1:26

Claims Require Continuous Playback

making the successive determinations to shift the playback quality based on at least one of the set of factors to achieve continuous playback of the video using the files of the highest quality one of the copies determined sustainable at that time; and

'772 EX1001 (772 Patent) at 13:21-62

Leaning's "Serious Mistracking" Issue

- Leaning discloses creating audio and video subfiles by encoding the source file at "different rates" and "then partition[ing] each source file 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, as before. These can be loaded onto the server in separate directories corresponding to the different rate, as in the following example structure, where "008k", "024k" in the directory name indicates a rate of 8 kbit/s or 24 kbit/s and so on.

EX1004 at 6:21-23

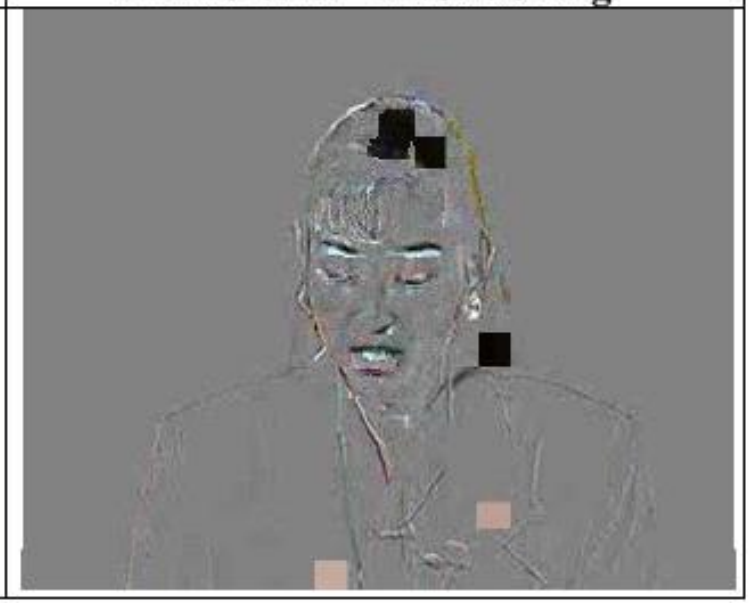
- But Leaning acknowledges that partitioning video files in this manner would prevent the decoder from properly decoding any video received after a rate switch, yielding "serious mistracking" in the decoded video:

> In the case of inter-frame coding systems such as the ITU H.261 standard, which do not provide for the frequent, regular inclusion of intra-frames, this is not possible. This is because – taking rate-switching as an example, if one were to request sub-file n of a higher bit rate recording followed by sub-file n+1 of a lower bit-rate recording, the first frame of the lower bit-rate sub-file would have been coded on an inter-frame basis using the last decoded frame of sub-file n of the lower rate recording, which of course the terminal does not have at its disposal – it has the last decoded frame of sub-file n of the higher rate recording. Thus serious mistracking of the decoder would occur.

EX1004 at 16:30

'772 POR at 32-34; EX2141 (Jeffay Declaration), ¶ 93-100

Leaning's "Serious Mistracking" Issue

Properly Decoded Frame	Frame With "Mistracking"
	

Screenshot of EX2135

Leaning's "Serious Mistracking" Issue

RATE SHIFT

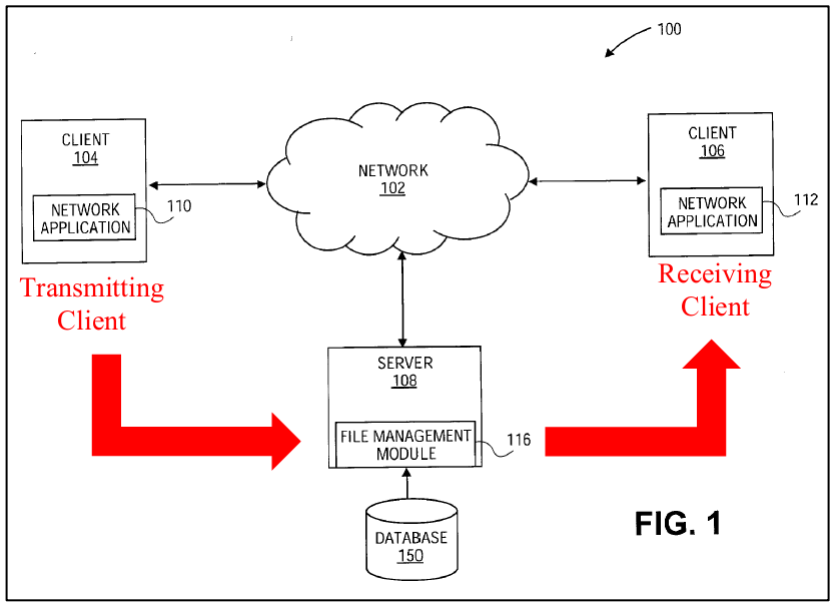


Demonstrative video only – no audio

EX2135, EX2136

U.S. Patent Pub. No. US 2004/0093420 ("Gamble")

- Gamble is directed to "data processing systems … for transferring large data files over parallel connections." Gamble's disclosed file transfer techniques involve "transferring [a] data file 702A at a client 104 to client 106 via a server 108." A "send buffer" is created at Gamble's transmitting client to store "segments of [a] data file." The segments are each sent on one of the parallel connections to server 108." The segments are then "transmitted" to receiving client 106 over corresponding "independent" connections before the data file is reconstructed at the receiving client.
- But Gamble fails to disclose or suggest individual requests for segments or sub-parts of segments as required by certain Challenged Claims.



EX1020, Fig. 1 (annotations added); '772 POR at 45; EX2141, ¶ 173

EX1020 (Gamble), ¶ [0001], [0042], [0045], [0049], Fig. 1; '772 POR at 44-47; EX2141, ¶¶ 52, 173-174

IV. Invalidity – Leaning

Petitioner's Leaning-Based Arguments Fail

Petitioner relies on Leaning combined with knowledge of a POSITA to disclose or render obvious every limitation of the Challenged Claims

Ground	Reference(s)	Challenged Claims	Basis
1	Leaning	1-21	103
2	Leaning and Gamble	2 and 9	103

But Leaning fails to disclose numerous elements, including:

- shifting to achieve "continuous playback"
- requesting files/streamlets via a "plurality of TCP connections"
- initially requesting "low quality" streamlets/files "to enable instant playback," and
- "arranging the streamlets … in order of ascending presentation time"

'772 POR at 23-44

Leaning Fails to Disclose or Suggest "Continuous Playback"

Leaning Fails to Disclose Shifting to Achieve "Continuous Playback"

Patent/Claims	Representative Element
'772 Patent, Independent Claim (1)	Claim 1: " A method for presenting rate-adaptive streams, the method comprising, … making the successive determinations to shift the playback quality based on at least one of the set of factors ***to achieve continuous playback*** of the video using the files of the highest quality one of the copies determined sustainable at that time…"
'564 Patent, All Independent Claims (1, 8)	Claim 1: "An end user station for adaptive-rate content streaming of digital content from a video server over a network, …wherein the media player streams the video by … 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…"
'156 Patent, All Independent Claims (1,13)	Claim 1: "An apparatus for rendering a video that is adaptively received as a digital stream from a video server over a network, … wherein the media player streams the video by … adapting the successive determinations to shift the playback quality based on the factor ***to achieve continuous playback*** of the video using the streamlets of the highest quality copy of the video that is determined to be sustainable at that time"

'772 POR at 23-30; '772 Sur-Reply at 8-9

Petition Failed to Address "Continuous Playback" Requirement

The Petition makes only one mention of the "continuous" requirement, referring to other elements. But those sections do not address the "continuous playback" requirement.

'772 Patent Claim Element 1[E]

Element 1[E]	Petitioner's Argument[8]
"making the successive determinations"	"Leaning discloses looping 'Stepup' until the highest sustainable rate is achieved up to the highest available rate (by setting RateU to zero)."
"to shift the playback quality based on at least one of the set of factors"	"[T]he excerpted and annotated portion of Leaning's process flow chart 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 <> 0 [there exists a next higher rate] then goto 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."
"to achieve continuous playback of the video"	—
"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.e.*, 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)."

'772 POR at 23-25

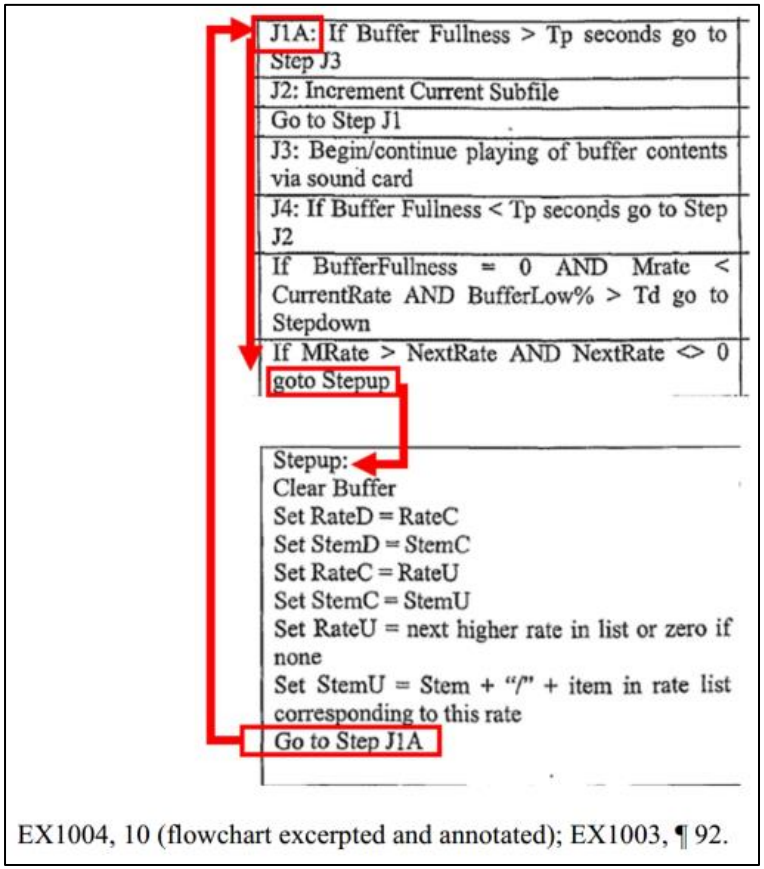
The Petition's Sole Mention:

> **j. 1[E]**
>
> Leaning teaches 1[E]. As explained above, Leaning discloses making the successive determinations to shift the playback quality based on the factor to achieve continuous playback of the video using the files (subfiles) of the highest quality copy of the video that is determined to be sustainable at that time. *See* 1[C]-1[D]. Leaning

Pet., 39

Petition Failed to Address "Continuous Playback" Requirement

The Petition includes an excerpt of Leaning's pseudo-code. But again, it ignores the "continuous playback" requirement and certain portions of Leaning. '772 POR at 25-26.



EX1004, 10 (flowchart excerpted and annotated); EX1003, ¶ 92.

'772 Pet. at 40.

subfile may be dependent upon successive determinations. More particularly, the player program makes multiple determinations one after the other before shifting up in quality and before shifting down in quality. EX1003, ¶ 88.

For example, when determining to shift down, the Player determines (1) if the buffer is empty, (2) if the measured rate is less than the current rate, and (3) if the measured Buffer Low Percentage more than a Step Down Threshold before shifting down; when determining to shift up, the Player determines (1) if the measured rate

'772 Pet. at 36.

sustainable). For example, the excerpted and annotated portion of Leaning's process flow chart 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 <> 0 [there exists a next higher rate] then goto 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. Thus, Leaning discloses looping "Stepup" until the highest sustainable rate is achieved up to the highest available rate (by setting RateU to zero). EX1004, 9-11; EX1003, ¶ 92.

'772 Pet. at 39-40.

Petitioner Cannot Abandon Original Position of Plain and Ordinary Meaning for Claim Terms

The Petition contended that no constructions were necessary and Petitioner's expert applied the ordinary and customary meaning of the claim terms.

> Petitioners submit that, for purposes of institution, no constructions are necessary. However, Petitioners acknowledge that in the ITC Investigation between Patent Owner and iFIT Inc. asserting family members of the '772 Patent, the Chief Administrative Law Judge ("ALJ") construed "a factor indicative of the current ability to sustain the streaming [of the video … wherein the set of one or more factors relate to the performance of the network]" according to its plain and ordinary meaning, "*e.g.*, one or more factors relating to the performance of the network that is indicative of an ability to sustain the streaming of the video." EX1009, 53-61. The ALJ also construed "repeatedly generating a factor" as "generating a factor more than once" and construed "successive determinations" according to its plain and ordinary meaning. *Id.*, 61-64.

Pet. at 14

> 53. For purposes of this declaration, I have applied the ordinary and customary meaning of the claims when read in light of the '772 Patent and the prosecution history of the '772 Patent, as understood by a POSITA at the time of the invention.

EX1003 (Houh Dec.) at ¶ 53

Petitioner Cannot Abandon Original Position of Plain and Ordinary Meaning for Claim Terms

Petitioner acknowledged that the ITC construed certain terms that are present in the Challenged Claims. Pet. at 14. Petitioner's Reply position is inconsistent with the ITC's interpretation of "continuous playback" as "uninterrupted viewing of the content." EX1009 at 56.

Petitioners submit that, for purposes of institution, no constructions are necessary. However, Petitioners acknowledge that in the ITC Investigation between Patent Owner and iFIT Inc. asserting family members of the '772 Patent, the Chief Administrative Law Judge ("ALJ") construed "a factor indicative of the current ability to sustain the streaming [of the video … wherein the set of one or more factors relate to the performance of the network]" according to its plain and ordinary meaning, "*e.g.*, one or more factors relating to the performance of the network that is indicative of an ability to sustain the streaming of the video." EX1009, 53-61. The ALJ also construed "repeatedly generating a factor" as "generating a factor more than once" and construed "successive determinations" according to its plain and ordinary meaning. *Id.*, 61-64.

Pet. at 14

a) "sustain the streaming of the video"

Respondents contend a person of ordinary skill in the art would not have understood the scope of the phrase "sustain the streaming of the video." Resps. Br. at 36.[11] But respondents' own

[11] Respondents concede "at least in concept, a person of skill may have understood what it means to 'achieve continuous playback' (uninterrupted viewing of the content)." Resps. Br. at 37-38.

EX1009 at 56 (highlighting added).

Petitioner Cannot Abandon Original Position of Plain and Ordinary Meaning for Claim Terms

In Reply, Petitioner argued that "continuous playback" is merely "aspirational" and "not limiting." Reply at 1.

2) Anticipating a Poor User Experience for Continuous Playback

Applicant respectfully submits that Radford discloses manually selecting the quality of the streamed data *in response to a poor viewing experience* (e.g., the streamed data deteriorates or is marred by interruptions). Radford, page 4, paragraphs 29 and 31. In contrast, claim 20 recites, as part of "automatically and progressively requesting," regularly generating performance factors indicative of the current ability to sustain the streaming of the video using different ones of the copies, and making the successive determinations to shift the playback quality based on the performance factors **to achieve continuous playback of the video** using portions of the highest quality one of the copies determined sustainable at that time". As such, Radford fails to disclose at least this limitation.

EX1002 at 118 (emphasis in original; highlighting added)

Challenged Claims expressly recite that "continuous playback" must be "achieve[d]."

This claim language was added by amendment to overcome prior art during prosecution.

On September 11, 2008, Applicant conducted an interview and revised the claims, arguing Radford no longer anticipates or renders obvious the claims as amended because Radford does not disclose automatically and progressively requesting video portions, achieving continuous playback, or multiple TCP connections. *Id.*, 110-122.

Pet. at 8-9

The Petition previously acknowledged and cited this part of the prosecution history.

'772 Sur-Reply at 4-6 (citing *Personalized Media Commc'ns, LLC v. Apple Inc.*, 952 F.3d 1336, 1341 (Fed. Cir. 2020) (features distinguished during prosecution are more likely limiting)

Petitioner Cannot Abandon Original Position of Plain and Ordinary Meaning for Claim Terms

In Reply, Petitioner also argued that the specification and file history do not suggest that "continuous playback" refers to uninterrupted playback. Reply at 2.

- Petitioner incorrectly concludes that Applicant only distinguished between manual (prior art) or automatic (claims). Reply at 2; *see* top right.
- Applicant separately emphasized that the amended claims required shifting quality "to achieve continuous playback" vs. the prior art that was "marred by interruptions." Sur-Reply at 5-6; *see* bottom right.

Applicant Remarks During Prosecution of '772 Patent:

1) Automatic and Progressively Requesting Subsequent Portions

Applicant respectfully submits that Radford discloses manually controlling the quality of the video being delivered by *allowing the user to manually select* one of the multiple content files (e.g., high quality video, low quality video, slide show presentation, audio only) by clicking on one of the buttons on the user interface. Radford, page 4, paragraphs 29-31, Figure 2, elements 230-250. In contrast, claim 20 recites "automatically and progressively requesting … portions of the video by requesting from different ones of the copies". As such, Radford fails to disclose at least this limitation.

2) Anticipating a Poor User Experience for Continuous Playback

Applicant respectfully submits that Radford discloses manually selecting the quality of the streamed data *in response to a poor viewing experience* (e.g., the streamed data deteriorates or is marred by interruptions). Radford, page 4, paragraphs 29 and 31. In contrast, claim 20 recites, as part of "automatically and progressively requesting," regularly generating performance factors indicative of the current ability to sustain the streaming of the video using different ones of the copies, and making the successive determinations to shift the playback quality based on the performance factors **to achieve continuous playback of the video** using portions of the highest quality one of the copies determined sustainable at that time". As such, Radford fails to disclose at least this limitation.

EX1002 at 118 (emphasis in original; highlighting added)

“Continuous Playback” is Limiting

- Petitioner also argues in Reply that Patent Owner’s arguments assume that the meaning of “continuous playback” “requires that the playback is completely uninterrupted in time and content.” Reply at 1.
- Patent Owner reads “continuous” as anyone, including courts and Petitioner’s own expert would, as excluding interruptions.

Continuous

The Court construes the term “continuous” as “playing one segment of a video followed by the playing of another segment in an uninterrupted sequence.”

’772 Sur-Reply, at 7; *Nissim Corp. v. Clearplay, Inc.*, No. 04-21140-CIV, 2005 WL 6220714, at *3 (S.D. Fla. Mar. 7, 2005).

So you've been handed now what's been marked as Exhibit 2200, correct?

A Well, I do see a sticker on this document that says "Exhibit 2200."

Q Perfect.

And it's entitled "Declaration of Dr. Henry H. Houh in Support of Petition for Inter Partes Review of US Patent No. 7,166,062," correct?

A Yes.

*****

Q The last sentence of that paragraph, which begins on page 83 and carries over, reads, "A POSITA would understand that data that is smooth and continuous is substantially uninterrupted because any interruption would cause disruption or jerkiness."

Did I read that correctly?

*****

A I think you -- you read it correctly. And this is in regards to another patent that I think is Studor, which is talking about terrain

EX2150 (Houh2 Tr.) at 148:19-150:12

DISH's MOVE Player Embodies Challenged Claims

- Petitioner adopts a fallback argument that the MOVE player sometimes exhibited playback stalls in extreme circumstances. Reply at 3. This is irrelevant.
- Regardless, as found by the ITC, DISH's objective evidence shows the MOVE player consistently wowed users with its smooth end user experience. EX1009 at 213; *see also* POR, 51-52; 54-70.

claimed method. While we express no view on the ultimate question whether Vitalink's DLS system infringes Claim 6, either literally or by equivalents, it should be noted that any future infringement analysis respecting the assigning step should be undertaken with due attention to the principle that an accused product that sometimes, but not always, embodies a claimed method nonetheless infringes. *See Paper Converting Mach. Co. v. Magna–Graphics Corp.*, 745 F.2d 11, 20, 223 USPQ 591, 597 (Fed.Cir.1984) ("[I]mperfect

Bell Communications Research, Inc. v. Vitalink Commc'ns Corp., 55 F.3d 615, 622-623 (Fed. Cir. 1995)

'772 Sur-Reply at 7-8.

ITC Findings

In contrast, Dr. Jeffay demonstrated through corroborating evidence that Move's success is tied to the "unique characteristics of the claimed invention." *See Fox Factory*, 944 F.3d at 1373-74. As Dr. Jeffay testified, the Move system was described as early as 2008 as offering " a smooth end user experience as the Move Media Player up-shifts and down-shifts in response to network and client CPU availability." CX-0008C (Jeffay RWS) at Q/A 304 (quoting CX-1096C (Move Networks Tech Overview) at 19). Moreover, the Move Media Player's encoding technique allowed streaming via HTTP, and the use of "[s]imple HTTP protocol transfer of media files from standard Web servers rather than deployment of expensive media servers' reduces cost and complexity." *Id.* at Q/A 324 (quoting CX-1096C at 22). DISH further adduced evidence demonstrating that the Move Media Player was recognized as superior in streaming performance relative to its competitors, rebutting respondents' argument that "advancements in compression and encoding technologies," etc. account for the Move Media Player's success. *See* CX-1047C

EX1009 at 213

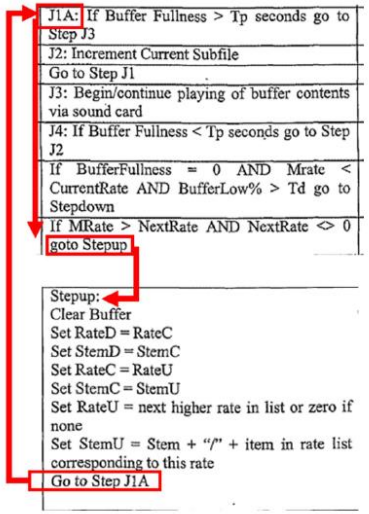
Leaning Fails to Disclose or Suggest "Continuous Playback"

The Petition and Petitioner's initial expert declaration rely on Leaning's pseudo-code "Stepup" and "Stepdown" procedures ***without any proposed modification***.

j. 1[E]

Leaning teaches 1[E]. As explained above, Leaning discloses making the successive determinations to shift the playback quality based on the factor to achieve continuous playback of the video using the files (subfiles) of the highest quality copy of the video that is determined to be sustainable at that time. *See* 1[C]-1[D]. Leaning teaches choosing the highest quality copy that is sustainable (*i.e.*, 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). EX1004, 8:24-26 ("if the measured rate exceeds not only the current rate **but also the next higher rate** for a given period of time . . . **increase the current rate**."), 9:3-7, 9-11 (flowchart showing successive determinations to shift up to highest rate deemed sustainable). For example, the excerpted and annotated portion of Leaning's process flow chart 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 <> 0 [there exists a next higher rate] then goto 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. Thus, Leaning discloses looping "Stepup" until the highest sustainable rate is

achieved up to the highest available rate (by setting RateU to zero). EX1004, 9-11; EX1003, ¶ 92.



EX1004, 10 (flowchart excerpted and annotated); EX1003, ¶ 92.

The Petition pointed to discontinuous code without modification

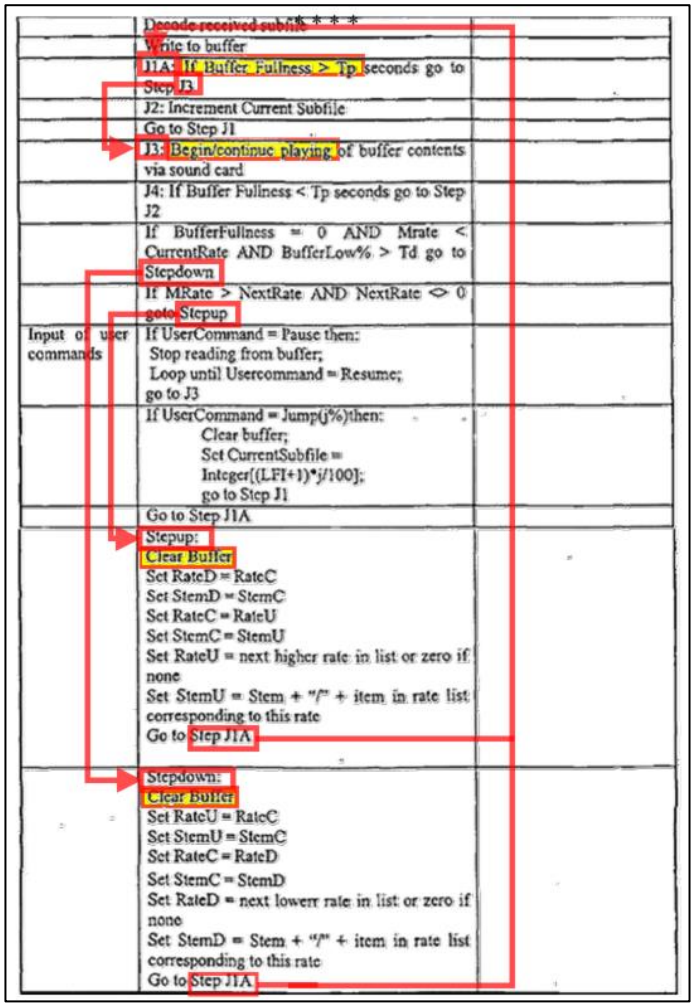
Pet at 39-40; *see also* EX1003, ¶92 (same)

Leaning Fails to Disclose or Suggest "Continuous Playback"

Dr. Jeffay explains that Petitioner's expert testimony uses a demonstrative from Leaning but ignores the yellow highlighted portions. EX2141, ¶ 72.

Every time Leaning upshifts at the "Stepup" routine, it clears the buffer ("Clear Buffer")

Leaning waits until the buffer is refilled ("If Buffer Fullness > T_P") before resuming playback ("Begin/continue playing")



Pet at 39-40; EX1003, ¶¶50–54; '772 POR at 23-30

Leaning Fails to Disclose or Suggest "Continuous Playback"

Dr. Jeffay further explains that Leaning consistently teaches clearing and re-filling a playback buffer as part of every shift. This mirrors the "progressive download" approach disparaged by the Challenged Patents. EX2141, ¶ 63.

Existing Approach with Reliability, Efficiency, and Latency Challenges

Another technology, known as "progressive downloads," attempts to combine the strengths of the above two technologies. When a progressive download is initiated, the media file download begins, and the media player waits to begin playback until there is enough of the file downloaded that playback can begin with the hope that the remainder of the file will be completely downloaded before playback "catches up." This waiting period before playback can be substantial depending on network conditions, and therefore is not a complete or fully acceptable solution to the problem of media presentation over a network.

EX1001 (772 Patent) at 1:62-2:5

Challenged Patents' Solution

The policy determination about whether or not to upshift **710** playback quality begins by comparing $\phi_{current}$ with a trigger threshold Θ_{up}. If $\phi_{current} \geq \Theta_{up}$, then an up shift to the next higher quality stream may be considered **716**. In one embodiment, the trigger threshold Θ_{up} is determined by a combination of factors relating to the current read ahead margin (i.e. the amount of contiguously available streamlets that have been sequentially arranged by the staging module **409** for presentation at the current playback time index), and a minimum safety margin. In one embodiment, the minimum safety margin may be 24 seconds. The smaller the read ahead margin, the larger Θ_{up} is to discourage upshifting until a larger read ahead margin may be established to withstand network disruptions. If the agent controller module **402** is

EX1001 (772 Patent) at 12:41-53

Leaning Fails to Disclose or Suggestion "Continuous Playback"

Aylo Premium Ltd, RPI to original Petitioner Aylo Freesites Ltd, expressly acknowledged Leaning's discontinuous playback in submitting arguments before the European Patent Office (EPO) on a related patent.

Aylo admitted that Leaning discloses clearing up to 2 minutes of content from the buffer, resulting in dramatic content discontinuity during playback.

Europäisches Patentamt
European Patent Office
Office européen des brevets

Submission in opposition proceedings

- representing the opponent(s): Aylo Premium Ltd

This corresponds to at least 120 seconds of playing time[1]. Since the upshift simply relates to the next sub-file being requested from the directory in which the higher quality copy is stored (E12, page 9, top), clearing the buffer would mean that for each upshift, there is a jump in the file by at least 120 seconds or 2 minutes. This would not make any technical sense at all. Hence, already from the upshift criterion disclosed on page 8, lines 24-

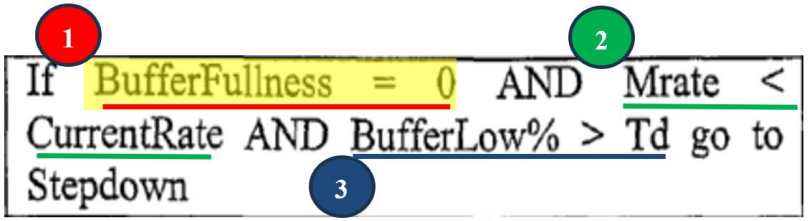
EX2016 (Aylo EPO Argument), at 9.

POR, 27-28; EX2141 (Jeffay Dec.), ¶ 81.

Leaning Fails to Disclose or Suggest "Continuous Playback"

In Reply, Petitioner proposes four new modifications to Leaning. None of these address Leaning's teaching that it will only perform "Stepdown" after multiple "buffer empties." This results in discontinuities prior to every downshift. Sur-Reply at 8-9; EX2141, ¶91.

Leaning's downshift test has three "AND" conditions



EX1004 (Leaning) at 10 (highlighting and annotations added)

Leaning explains that the third condition—"BufferLow%"—ensures multiple buffer empties occur prior to downshifting

The Buffer Low Percentage is the percentage of the time that the buffer contents represent less than 25% of the playout time (i.e. the buffer is getting close to being empty). If the Step Down Threshold is set to 0% then when the buffer empties the system always steps down when the other conditions are satisfied. Setting the Step Down Threshold to 5% (this is our preferred default value) means that if the buffer empties but the measured Buffer Low Percentage is greater than 5% it will not step down. Further buffer empties will obviously cause this measured rate to increase and will eventually empty the buffer again with a Buffer Low Percentage value exceeding 5% if the rate can not be sustained. Setting the value to 100% means the client will never step down.

EX1004 (Leaning), 8:27–9:2; EX2124, ¶ 91 (explaining the same)

The Petition expressly relies on this interruption-causing "BufferLow%" condition without modification. And Petitioner does not address this condition in Reply

'772 PO Sur-Reply, 11-12

Petitioner's Changing Arguments

Petition

A single, conclusory sentence that parrots the claim language.

j. 1[E]

Leaning teaches 1[E]. As explained above, Leaning discloses making the successive determinations to shift the playback quality based on the factor to achieve continuous playback of the video using the files (subfiles) of the highest quality copy of the video that is determined to be sustainable at that time. *See* 1[C]-1[D]. Leaning

Pet., 39

Identical

making the successive determinations to shift the playback quality based on at least one of the set of factors to achieve continuous playback of the video using the files of the highest quality one of the copies determined sustainable at that time; and

'772 Patent, claim 1

Reply

Four newly-minted obviousness modifications:

1. Avoiding the "clear buffer" command
2. "Up-Sampling" video
3. Altering T_P threshold
4. Modifying video codecs to avoid Leaning's express "mistracking" issues

Reply at 3-4; EX2124, ¶ 91; '772 Sur-Reply at 8-17

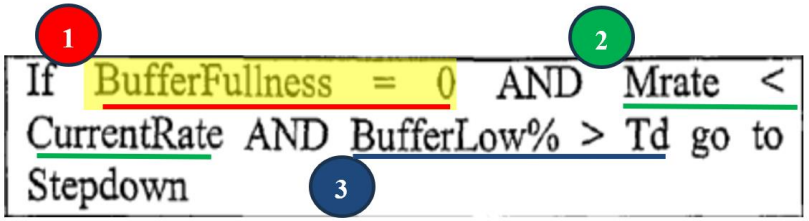
New Modification No. 1: Remove the "Clear Buffer" Command

In New Modification No. 1, Petitioner argues that a POSITA would remove Leaning's "clear buffer" instruction. Reply at 4.

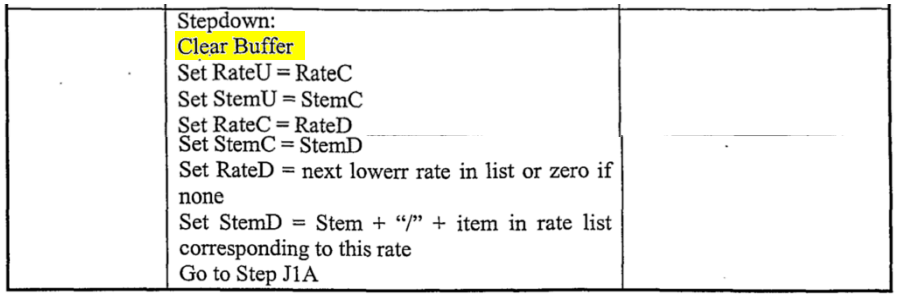
This relies on an alternate embodiment in Leaning.

The alternate embodiment "run[s]" the sound card "continuously at the highest sampling rate envisaged" to avoid "interruption[s]" in audio due to "re-setting" the sound card. Reply at 3-4; Houh2 ¶¶61-66.

But Leaning states this applies only to downshifts and Leaning's "BufferFullness=0" condition—it does not apply to the "Clear Buffer" command



EX1004 at 10 (highlighting and annotations added)



EX1004 at 10-11 (highlighting added)

Reply at 3-4; EX2124, ¶ 91; '772 Sur-Reply at 11-13; EX1004, 14:25-15:8

New Modification No. 1: Remove the "Clear Buffer" Command

Leaning discloses that the first of the three downshift conditions—"BufferFullness=0," requiring the buffer be empty—"would be omitted" in the alternative embodiment.

The "interruption" being avoided is solely the interruption due to underflow that occurs for the "BufferFullness=0" condition.

It does not avoid interruption resulting from the act of downshifting itself (i.e., clearing and refilling the buffer).

'772 Reply at 3-4; '772 Sur-Reply at 11-12

Changes of sampling rate (and indeed switching between mono and stereo operation) have some practical implications for operation of the audio interface 36. Many conventional sound cards, although capable of operation at a range of different settings, require re-setting in order to change sampling rate, and necessarily this causes an interruption in its audio output. Thus in a further modification, we propose that the sound card could be run continuously at the highest sampling rate envisaged. When the player program is supplying, to the buffer, data at a lower sampling rate, this data is then up-sampled to this highest rate before or after the buffer. Similarly, if the card is always operated in stereo mode, decoded mono signals can be fed in parallel so feed both the left and right channels of the sound card input. Again, if the number of bits per sample of the decoded signal is lower than expected by the card, the number of bits can be increased by padding with zeros.

Recollecting that the criteria discussed earlier for automatic data rate switching downwards envisaged a rate reduction only in cases of buffer underflow (involving therefore interruptions in the output), we note that with this modification such interruption can be avoided and therefore it is preferable to employ a criterion which anticipates underflow and avoids it in the majority of cases. In this case the first of the three AND conditions mentioned above (namely, that the buffer is empty) would be omitted.

EX1004, 14:25-15:8

New Modification No. 1: Remove the "Clear Buffer" Command

- Leaning's "clear buffer" command is performed in an embodiment using a single, fixed sampling rate.
- If the "clear buffer" command is only required to accommodate different sampling rates, as Petitioner contends, there would be no reason for Leaning to require buffer clearing in the very embodiment where sampling rate remains constant.

slightly. Note that in this embodiment of the invention, the available data rates, though they use different degrees of quantisation, and differ as to whether they encode in mono or stereo, all use the same audio sampling rate and in consequence the same frame size. Issues that need to be addressed when differing frame sizes are used are discussed below.

EX1004, 12:23-26

Leaning acknowledges that interruption is unavoidable and merely aims to reduce "extra delay"

As for the actual sub-file length, excessively short sub-files should preferably be avoided because (a) they create extra network traffic in the form of more requests, and (b) on certain types of packet networks - including IP networks – they are wasteful in that they have to be conveyed by smaller packets so that overhead represented by the requesting process and the packet header is proportionately greater. On the other hand, excessively large sub-files are disadvantageous in requiring a larger buffer and in causing extra delay when starting play and/or when jumps or rate changes are invoked. A sub-file size of between 30% and 130% of the playout time, or preferably around half the playout time (as in the examples given above), is found to be satisfactory.

EX1004, 12:31-33

Petitioner's theory is contradicted by Leaning's disclosures.

'772 Sur-Reply at 13

New Modification No. 2: Up-Sample Video

- In New Modification No. 2, Petitioner argues that a POSITA would have applied Leaning's audio-limited "up-sampling" logic to video in order to accommodate rate switching. Reply at 9-10.
- But Dr. Jeffay explains that video has no analog to audio "sampling rate" such that Leaning's suggestion to up-sample audio to avoid a reset does not, and cannot, extend to video. Sur-Reply at 13-14.

148. Whereas audio is a simple two-dimensional signal of an amplitude over time, video is a more complicated multi-dimensional signal: two spatial dimensions of pixels over time (a third dimension), multiplied by multiple color dimensions—such as red/green/blue or Y/U/V (luminance/chrominance) components. Thus, whereas concepts such as sampling rate in audio (the number of samples taken of the analog audio signal per unit of time) are well defined, the same is not true for video. The number of pixels in a video image (the image size) can change, as can the frame rate and the color depth (the number of represented colors) and the means of sampling and representing color can change.

EX2141, ¶ 148.

New Modification No. 2: Up-Sample Video

- A POSITA would understand that Leaning's video card would also need to be cleared when switching streams

89. To achieve continuous playback, the self-contained teaching of Leaning would have to be fundamentally changed. Indeed, a POSITA would have to abandon one of the central teachings of Leaning—specifically, the clearing of the buffer when changing the data rate. Leaning explains how clearing the playback buffer is "advantageous" and "may be necessary" during a "rate shift" because it provides time to "reconfigure" the "sound card" and to retrieve the next audio sub-file "immediately." EX1004, 8:20-23, 11:19-20. Although Leaning primarily addresses these benefits in the context of a "sound card," a POSITA would have understood that those teachings applied equally to hardware video cards at the time of Leaning for the decompression and display of full-motion, color video, which also would have needed to be cleared and reset in order to decode video according to the specific parameters of any new incoming bitstream. EX2139 ('332 Patent) at 10:18-32 ("for the decoder to adapt to the context" of "one MPEG transport stream to another," "undesirable audio and video discontinuities may result." "One attempt to solve this discontinuity problem is to reset the decoder, squelch the audio and freeze the video for a certain amount of time").

90. Leaning's teachings are entirely consistent with this technical requirement of video cards at the time of Leaning. Leaning recognizes that a video card would be required for video playback, and that "[f]or video delivery, a video card would be fitted in place of, or in addition to, the [sound] card." EX1004, 4:9-10. But Leaning does not make any special accommodation for video cards. Thus, when Leaning teaches to "clear [the] buffer," a POSITA would understand that instruction (possibly Leaning's "same principle" to also apply to the decode buffer of a video card in the same way it applies to a sound card). Indeed, Petitioner's expert, Dr. Houh, admitted during 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. EX2129 (Houh Tr.) 103:18-104:9.

EX2141, ¶¶ 89-90.

New Modification No. 2: Up-Sample Video

Dr. Jeffay explained why Petitioner is wrong – a POSITA would understand that, like Leaning's audio card, a video card would also need to be reset when switching

Leaning discloses hardware video cards

interface 35, and audio interface ("sound card") 36. For video delivery, a video card would be
10 fitted in place of, or in addition to, the card 36. In the disk store are programs which may be

EX1004, 4:9-10

Contemporaneous publications acknowledge "discontinuities" and confirm a "reset" was required for switching video streams

In the set-top application as shown in FIG. **2**, a problem arises when the viewer rapidly scans through the channels available from the decoder **61**. If a simple demultiplexer is used to switch from one MPEG transport stream to another from the cable **62**, a considerable time will be required for the decoder to adapt to the context of the new stream. During this adaptation process, undesirable audio and video discontinuities may result. One attempt to solve this discontinuity problem is to reset the decoder, squelch the audio, and freeze the video for a certain amount of time after switching from one MPEG transport stream to another. However, this approach will slow down the maximum rate at which the viewer can scan through the channels while looking for an interesting program to watch.

EX2139, 10:18-32

EX2141 (Jeffay Dec.) ¶ 89.

89. To achieve continuous playback, the self-contained teaching of Leaning would have to be fundamentally changed. Indeed, a POSITA would have to abandon one of the central teachings of Leaning—specifically, the clearing of the buffer when changing the data rate. Leaning explains how clearing the playback buffer is "advantageous" and "may be necessary" during a "rate shift" because it provides time to "reconfigure" the "sound card" and to retrieve the next audio sub-file "immediately." EX1004, 8:20-23, 11:19-20. Although Leaning primarily addresses these benefits in the context of a "sound card," a POSITA would have understood that those teachings applied equally to hardware video cards at the time of Leaning for the decompression and display of full-motion, color video, which also would have needed to be cleared and reset in order to decode video according to the specific parameters of any new incoming bitstream. EX2139 ('332 Patent) at 10:18-32 ("for the decoder to adapt to the context" of "one MPEG transport stream to another," "undesirable audio and video discontinuities may result." "One attempt to solve this discontinuity problem is to reset the decoder, squelch the audio and freeze the video for a certain amount of time").

POR, 31, n.12

New Modification No. 3: Alter T_P Threshold

- In New Modification No. 3, Petitioner argues that buffer delay could be avoided by setting T_P to 3 seconds instead of the 10-second value disclosed in Leaning. Reply at 5.
- For any T_P value, Leaning requires downloading an entire sub-file before playback can resume (temporal discontinuity).
- Reducing T_P may shorten interruption but does not eliminate it. Sur-Reply at 14-15.

7. The player program increments the filename to 000001.bin and requests, receives, decodes and stores this second sub-file as described in (4) and (5) above. It repeats this process until the contents of the buffer reach or exceed the playout time T_p. Note that it is not actually essential that the decoding occurs before the buffer but it simplifies matters as since the audio is decoded back to raw PCM then the duration of the buffered material is then explicitly known. It simplifies the control of the audio buffer if each of the sub-files is the same audio playback size.

8. Having reached the playout threshold T_P the decoded data are sent from the buffer to the audio interface 36 which plays the sound through a loudspeaker (not shown).

EX1004, 5:23-31

New Modification No. 3: Alter T_P Threshold

Because reducing T_P does not eliminate interruption, Petitioner then argues Leaning's "clear buffer" command does not actually clear (discard) the buffer contents. Instead, Petitioner argues that Leaning's "clear buffer" command simply waits until the buffered content finishes playing out. Reply at 5-6. This is implausible and contradicted by Leaning. Sur-Reply at 14-15.

"Clear Buffer" and "play[] buffer contents" are separate commands

Leaning does not wait for residual content to empty from the buffer

recording would result in a request for the 26th sub-file - i.e. 000025.bin. It will be apparent that this calculation is considerably simplified if each sub-file corresponds to the same fixed duration. We prefer, in the case of the jump, to suspend decoding and clear the buffer so that the new request is sent immediately, but this is not actually essential.

proportionately greater. On the other hand, excessively large sub-files are disadvantageous in requiring a larger buffer and in causing extra delay when starting play and/or when jumps or rate changes are invoked. A sub-file size of between 30% and 130% of the playout time, or preferably

EX1004, 11:19-20, 12:31-33; EX2129 at 97:24-98:24.

User	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	
	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	

EX1004, 10 (highlighting added).

New Modification No. 3: Alter T_P Threshold

This new theory is contradicted by Petitioner's expert's prior testimony in this case. He confirmed that "clear buffer" is performed in Leaning to ensure there is no "data in the buffer" when changing sampling rates. Sur-Reply at 14-15.

Dr. Houh's Testimony

Q. So it is your view that clear buffer on page 10 is to allow for resetting of the sound card?

A. I think generally if you reset a card like that it is kind of teaching that that is kind of what happens. Is that you have to reset the parameters, but the reason to clear the buffer is that if the data in the buffer were at the wrong -- a different sampling rate like say -- and the sampling rate was changed that, you know, you would either get an octave lower or octave higher if you reproduce it at a range -- the rate changed by a factor of two.

So if one followed the modification which is explicitly taught in Leaning but running it at the highest -- the highest rate, then it would not be necessary because the reason that -- you know, is that the data in the buffer if they are just raw audio samples, if you reproduce them at a different rate, it would change the way it sounds kind of like when someone breaths helium or when

EX2129 at 97:24-98:24.

New Modification No. 4: Avoid "Mistracking"

- In New Modification No. 4, Petitioner argues that a POSITA would have known how to implement Leaning's solution to avoid "mis-tracking." Reply at 7. Petitioner argues a POSITA would do this by modifying Leaning to
  (A) use "Motion JPEG2000" or
  (B) use some unidentified alternative codec that purportedly "hold[s] the group of pictures/frames for each sub-file constant across the encoding at different bit rates." Reply at 7.
- But this is purely speculative. Sur-Reply at 15-17.

Leaning acknowledges complexities in video streaming.

The delivery of video recordings does however have further implications for file partitioning if switching or jumps are to be permitted. In the case of recordings where each frame of a picture is coded independently, it is sufficient that a sub-file contains a whole number of frames of a picture. If compression involving inter-frame techniques is in use, however, the situation is more complex. Some such systems (for example the MPEG standards) generate a mixture of independently coded frames ("intra-frames") and predictively coded frames; in this case each sub-file should preferably begin with an intra-frame.

In the case of inter-frame coding systems such as the ITU H.261 standard, which do not provide for the frequent, regular inclusion of intra-frames, this is not possible. This is because – taking rate-switching as an example, if one were to request sub-file n of a higher bit rate recording followed by sub-file n+1 of a lower bit-rate recording, the first frame of the lower bit-rate sub-file would have been coded on an inter-frame basis using the last decoded frame of sub-file n of the lower rate recording, which of course the terminal does not have at its disposal – it has the last decoded frame of sub-file n of the higher rate recording. Thus serious mistracking of the decoder would occur.

New Modification No. 4(A): Use Motion JPEG2000

A POSITA would not have been motivated to modify Leaning to use "Motion JPEG2000." Sur-Reply at 15-17. Dr. Jeffay explained that Motion JPEG200 was not a practical option for streaming applications, like Leaning's, that required effective delivery of compressed content at high transmission rates. EX2141, ¶ 147.

Leaning disclosed use of MPEG.

recordings with an accompanying sound track. In the simpler version, where there is only one recording, the system differs from the audio version only in that the file is a video file (e.g. in H.261 or MPEG format) and the player program incorporates a video decoder. The manner of partitioning the file into sub-files is unchanged.

frames of a picture. If compression involving inter-frame techniques is in use, however, the situation is more complex. Some such systems (for example the MPEG standards) generate a mixture of independently coded frames ("intra-frames") and predictively coded frames; in this case each sub-file should preferably begin with an intra-frame.

EX1004, 16:7-10, 20-23

Motion JPEG2000 has a lower coding efficiency and achieves worse compression than MPEG.

Motion JPEG2000 is an extension of JPEG2000 for the coding of video sequences. It is based on an intra-frame wavelet transform. The reader is referred to [2] for a thorough presentation of JPEG2000. As it relies on intra-frame coding, Motion JPEG2000 has a lower coding efficiency at the benefit of a lower complexity. In

EX1046 at 1

JPEG, while designed for still images, is often applied to moving images, or video. Motion JPEG is possible if the compression/decompression algorithm is executed fast enough (on a fast chip or chip set) to keep up with the video data stream, but at typical compression ratios of about 16:1, there is not a considerable saving (compared to the 100:1 ratios of MPEG-1) and not good enough compression to play from a CD-ROM (which is constrained to transfer data at 150 kbps or 300 kbps, depending on rotation speed). However, full-motion JPEG will be employed in professional video processing, since there are no missing frames in the bit stream, and frame-by-frame editing can be precise. Note that JPEG does not address the question of audio tracks and audio/video synchronization.

EX1053 at 2

A POSITA would have had no reason to go outside Leaning's teachings to use a less efficient format that creates larger files.

New Modification No. 4(B): Encode Sub-Files to Begin With I-Frames

- For New Modification No. 4(B), Petitioner proposes modifying Leaning's sub-files to each begin with an ***I-Frame***. Reply, 7-8; Sur-Reply at 17.

The Petition expressly relies on Leaning's teaching of ***first*** encoding the content into multiple rates, ***then*** partitioning into subfiles:

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, as before. These can be loaded onto the

Leaning (EX1004), 6:21-23

c. 1[A][2]

Leaning teaches 1[A][2]. Leaning discloses that each of a plurality of different copies (two or more versions of the recording) of the video encoded at different bit rates (compression rates) is stored on the video server (sever 1). EX1004, 6:13-26

Pet., at 21; see also *id.*, at 22, 25, 35 (relying on same portion of Leaning)

New Modification No. 4(B): Encode Sub-Files to Begin With I-Frames

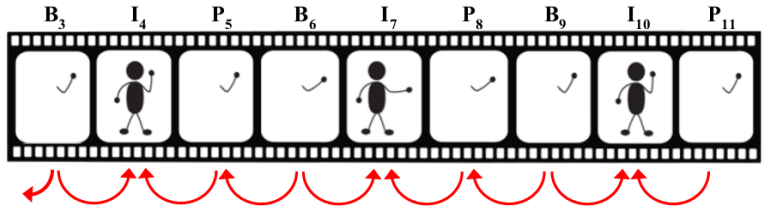
Following Leaning's teaching would lead to mistracking, even if the sub-files could somehow start with I-Frames

Dr. Jeffay explains that MPEG video files include B frames that would not decode correctly if sliced at I-Frame boundaries.

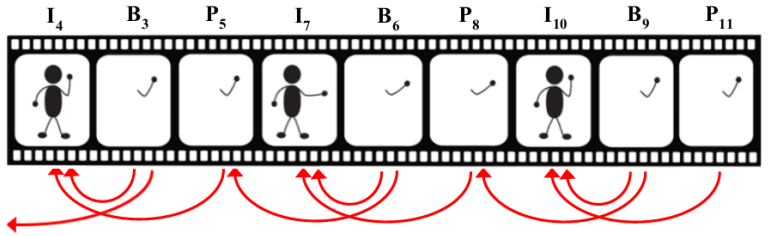
EX2141, ¶¶ 166-170

the results would still include mistracking at the decoder if a video is divided into sub-files with an I-frame at the beginning of each sub-file, as depicted below.

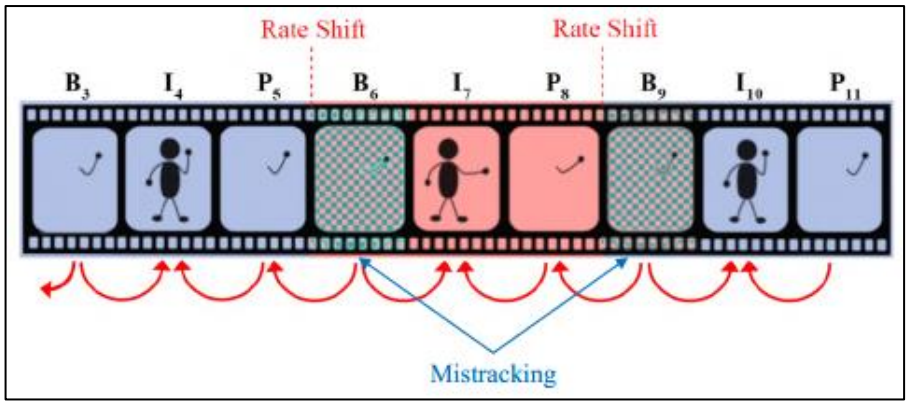
EX2141 ¶169

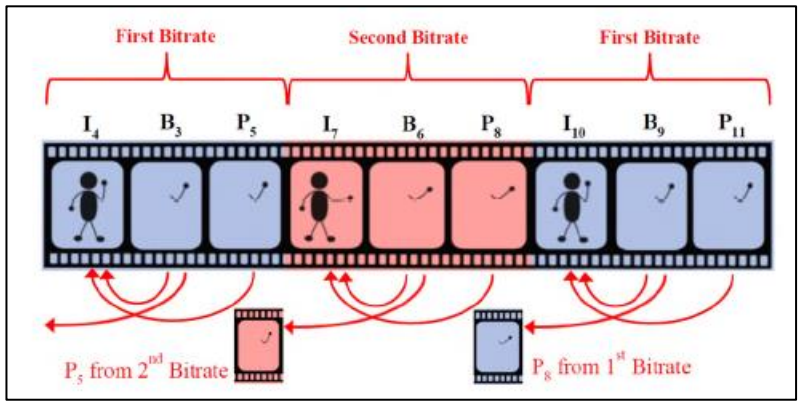


Encoded Sequence (Display Order)



Encoded Sequence (Transmission Order)





New Modification No. 4(B): Encode Sub-Files to Begin With I-Frames

Petitioner's expert also asserts that a POSITA would have known how to hold GOP (Group of Pictures) structures constant across encodings. EX1026, ¶ 94; Reply at 7-8. This is insufficient to establish a *prima facie* case of obviousness. Sur-Reply at 17.

No citations to contemporaneous reference, technical publication, or prior art

Only vague appeals to general video coding knowledge

Dr. Houh's Testimony

> 94. In encoding standards like MPEG, frames are grouped together into what is referred to as a group of pictures. A person of ordinary skill in the art would understand that one could hold the group of pictures constant across bitrates—the same frame at the start and the same frame at the end. The result would be that if, at one bitrate, a sub-file begins at an I-frame (intra-frame), the same would be true at different bitrates. Changing the bitrate would not affect where the I-frame is located.

EX1026, ¶ 94

Leaning Fails to Disclose or Render Obvious Use of a Plurality of TCP Connections

The Challenged Claims recite "***requesting*** by the media player a plurality of sequential ones of the files of one of the copies from the set of servers ***over a plurality of Transmission Control Protocol (TCP) connections*** based on the time indexes."

In the Petition, Petitioner argued that Leaning "teaches that the media player (player program) is configured to stream the video from the video server (server 1) over a plurality of TCP connections." Pet. at 31-32 (citing EX1004, 2:5-32).

The Challenged Patents acknowledge the challenge of delays/losses with TCP connections

> Generally, three basic challenges exist with regard to data transport streaming over a network such as the Internet that has a varying amount of data loss. The first challenge is reliability. Most streaming solutions use a TCP connection, or "virtual circuit," for transmitting data. A TCP connection provides a guaranteed delivery mechanism so that data sent from one endpoint will be delivered to the destination, even if portions are lost and retransmitted. A break in the continuity of a TCP connection can have serious consequences when the data must be delivered in real-time. When a network adapter detects delays or losses in a TCP connection, the adapter "backs off" from transmission attempts for a moment and then slowly resumes the original transmission pace. This behavior is an attempt to alleviate the perceived congestion. Such a slowdown is detrimental to the viewing or listening experience of the user and therefore is not acceptable.

EX1001, 2:6-21

Leaning Fails to Disclose or Render Obvious Use of a Plurality of TCP Connections

- Leaning does not mention, and has no use for, multiple TCP connections.
- Rather, 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; POR at 36-37.
- If an error is encountered, Leaning teaches to simply "Stop."

The Challenged Patents mitigate errors to maintain continuous playback by using multiple TCP/IP connections

When a TCP connection fails completely, a new request may be sent on a different connection for the same streamlet **212**. In a further embodiment, if 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**. If the first streamlet request's response arrives before the redundant request response, the redundant request can be aborted. If the redundant request response arrives before the first request response, the first request may be aborted.

EX1001, 9:59-67

Leaning "stops" if any "error" is received

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

EX1004, 10

Leaning Fails to Disclose or Render Obvious Use of a Plurality of TCP Connections

Leaning describes requesting sub-files individually, one-at-a-time in a predefined sequence. EX1004, 12:9-11.

> It is of interest to discuss further the process of partitioning the original file into sub-files. First, it should be noted that if (as in the first version described above), 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, then it matters little where the boundaries between the sub-files are located. In that case

EX1004, 12:9-11

This confirms that Leaning fails to contemplate use of multiple TCP connections and the adaptive architecture equipped to handle network failures involving multiple TCP connections, as required by the Challenged Claims. POR at 36-39; Sur-Reply at 18; EX2141 (Jeffay Decl.), ¶¶106-110.

Leaning Fails to Disclose or Render Obvious Use of a Plurality of TCP Connections

Petitioner argues that a POSITA would have understood "Leaning's teachings of a terminal connecting to an ordinary web server … to include teaching a plurality of TCP connections … because a POSITA would have known that ordinary web servers supported both HTTP and TCP … [and] each HTTP request in HTTP 1.0 must establish a new TCP connection." Pet., 32-33. This is incorrect.

Dr. Jeffay explains that:

- Leaning does not disclose use of HTTP 1.0
- HTTP 1.1 was standardized in January 1997
- HTTP 1.1 was in widespread use at the time of Leaning
- A POSITA would have understood Leaning's reference to HTTP to refer to HTTP 1.1

EX2141 (Jeffay Dec.) at ¶ 112

The ubiquity of persistent HTTP connections teaches away from use of parallel connections in Leaning.

> HTTP 1.1 used persistent TCP connections wherein a client could make multiple requests of a server on a single TCP connection. EX2137 (RFC 2068 – HTTP/1.1 (1997)). In fact, by 2000, even in HTTP 1.0, persistent connections were possible and widely used. EX2138 (RFC 2616 – HTTP/1.1 (1999)), at 105. 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.

Excerpt of EX2141 at ¶ 112

Leaning Fails to Disclose or Render Obvious a Plurality of TCP Connections

In Reply, Petitioners and their expert argue that the functionality for issuing multiple TCP connections is inherent in the "TCP protocol" itself. Reply at 12-13 (citing EX1026, ¶¶126-134). But Dr. Houh's position is contradicted by prior testimony where he identified multiple TCP connections as a "critical" unclaimed feature, rather than inherent in the protocol itself. *E.g.*, IPR2024-00043, EX1028, ¶74. '772 Sur-Reply at 18.

> 74. Here, the MOVE player includes at least one such "critical unclaimed feature"—using multiple parallel TCP connections for requesting streamlets in parallel.[7] MOVE's internal documents describe this feature as the "secret" to the MOVE player, and it is not even claimed in the '798 Patent. EX2011, 4 ("The secret lies in our use of multiple TCP connections" whereas "[o]ther streaming solutions use a single connection"); EX2059, 11. I also understand that Mr. Major agreed this

IPR2024-00043, EX1028, ¶74; '772 Sur-Reply at 18

Leaning Fails to Disclose or Render Obvious Initially Requesting Low Quality Files for Instant Playback

- Dependent Claim 6 of the '772 Patent recites "wherein requesting the plurality of sequential one[s] of the files includes requesting the files from ***a low quality*** one of the different copies to enable ***instant playback*** of the video,…wherein said automatically requesting includes upshifting to a higher quality one of the different copies."
- Dr. Jeffay explains that a POSITA would understand that the claimed media player initially requests "low quality" files to ensure that playback can begin "instant[ly]" even if the current performance of the network being used to request them is poor. EX2141, ¶115. A POSITA would also understand that, if the first files requested were of a quality that is higher than the current performance of the network could support, downloading would be delayed, such that "instant playback" is not possible. POR at 40-41.

Leaning cannot achieve "instant playback" because it requires filling buffer past threshold:

8. Having reached the playout threshold T_P the decoded data are sent from the buffer to the audio interface 36 which plays the sound through a loudspeaker (not shown).

EX1003 at 5:30-31

Leaning Fails to Disclose or Render Obvious Initially Requesting Low Quality Files for Instant Playback

Petitioners argue that Leaning inherently discloses initially requesting low quality files because Leaning's example index file happens to list the second-highest available rate first. Reply, 14-15. This is legally and factually erroneous.

"[A]nticipation by inherent disclosure is appropriate only when the reference discloses prior art that must necessarily include the unstated limitation." *Transclean Corp. v. Bridgewood Servs., Inc.*, 290 F.3d 1364, 1373 (Fed. Cir. 2002).

Leaning discloses selecting the fourth-lowest quality out of a set of five (*i.e.*, the second "best" quality)

No evidence that seemingly random-ordered listing of bitrates reflects prioritizing startup latency

Fig.3.

```
<html>
<head>

<!-- Odbits: Mode = "recorded" -->
<!--  Audio = "mp3-024k_11_s mp3-032k_11_s mp3-018k_11_s mp3-016k_11_m
mp3-008k_11_m" -->
<!-- LFI = "44" -->
<!-- SL = "178" -->
<!-- Title = "Toccata and Fugue in D minor" -->
<!-- Author = "J.S. Bach" -->
<!-- Created = "6 Nov 2000" -->
<!-- Copyright = "© 1999" -->
<!-- Comments = "One of Bach's many organ works." -->
</head>
<body>
An announcement to appear on the display
</body>
</html>
```

EX1003 at Fig. 3 (highlighting added)

Leaning Fails to Disclose or Render Obvious Initially Requesting Low Quality Files for Instant Playback

Leaning requires filling its buffer past the playout time T_P, and does not disclose bypassing the T_P process. Leaning also acknowledges that requesting higher quality (i.e., larger) sub-files results in "extra delay" when starting playback. Leaning does not, and could not, achieve "instant playback." POR at 41-42; Sur-Reply at 19-20. Petitioner argues that Leaning discloses "pre-requesting files (sub-files) before playback." This is unavailing as Petitioner admits that playback does not begin "until the contents of the buffer reach of exceed a threshold T_P." Pet. at 44.

6. The player program has a parameter called the playout time T_p. In this example it is set at 10 seconds (it could be made user-selectable, if desired). It determines the degree of buffering that the terminal performs.

8. Having reached the playout threshold T_P the decoded data are sent from the buffer to the audio interface 36 which plays the sound through a loudspeaker (not shown).

proportionately greater. On the other hand, excessively large sub-files are disadvantageous in requiring a larger buffer and in causing extra delay when starting play and/or when jumps or rate changes are invoked. A sub-file size of between 30% and 130% of the playout time, or preferably around half the playout time (as in the examples given above), is found to be satisfactory.

EX1004, 12:31-33

'772 POR 40-42; '772 Sur-Reply at 19-20; Pet. at 44; EX1004 at 5:6-6:2

Leaning Fails to Disclose or Render Obvious "Arranging" Files

The Petition contained no specific analysis or obviousness rationale for claim 8, which recites the active step of "sequentially arranging the requested files from the different copies in the order of ascending playback time for playback with the media player on the end user station." This is not sufficient.

Petition

> **8. Claim 8**
>
> Leaning teaches claim 8. *See* 1[F] (requesting, receiving, and displaying ordered series of presentation segments, including collections of segments at different quality levels), 1[A][2] (different copies encoded at different bit rates), 1[C][2] (retrieving collections of segments at different quality levels); EX1003, ¶ 103.

Pet. at 47

Dr. Houh's Testimony

> 103. In my opinion, Leaning teaches claim 8. *See* 1[F] (requesting, receiving, and displaying ordered series of presentation segments, including collections of segments at different quality levels), 1[A][2] (different copies encoded at different bit rates), 1[C][2] (retrieving collections of segments at different quality levels).

EX1003, ¶ 103.

Leaning Fails to Disclose or Render Obvious "Arranging" Files

Leaning does not contemplate a need to "sequentially arrang[e]" sub-files on the user terminal. As Dr. Jeffay explains, Leaning only discloses its sub-files being stored and played back in the order in which they are received by giving its sub-files "file names which include a serial number indicative of their sequence in the original file." EX1004, 3:10-18; EX2141, ¶120.

Person preparing file for loading onto web server partitions the file in Leaning:

000000.bin
000001.bin
000002.bin
000003.bin
.
.
000134.bin

EX1004, 3:10-18

Leaning prefers this approach as it is simple to implement:

> The sub-file naming convention used here, of a simple fixed length sequence of numbers starting with zero, is preferred as it is simple to implement, but any naming convention can be used provided the player program either contains (or is sent) the name of the first sub-file and an algorithm enabling it to calculate succeeding ones, or alternatively is sent a list of the filenames.

EX1004, 6:5-8

Leaning has no expectation of receiving sub-files in any order other than "original sequence:"

> First, it should be noted that if (as in the first version described above), 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, then it matters little where the boundaries between the sub-files are located. In that case

EX1004, 12:9-11

V. Invalidity – Obviousness: Leaning in View of Gamble (’772 and ’564 Patents) or Ala-Honkola (’156 Patent)

The Gamble Combination Fails to Disclose "requesting sub-parts of the files … over different … connections"

The Petition modifies Leaning's client-server architecture to include Gamble's alleged sub-parts of files that are requested over a plurality of TCP connections and reassembled in a peer-to-peer-based environment.

> A POSITA would have been motivated to configure Leaning's apparatus to request sub-parts of the files (subfiles) over different TCP connections and reassemble the files from the received subparts, such as taught by Gamble. A POSITA would have understood that this improves reliability in situations where one connection fails by retrieving other subparts over other connections and retrieving more of file more quickly. A POSITA also would have understood that it takes advantage of available bandwidth by parallelizing retrieval of a segment to increase throughput where an individual TCP connection's maximum throughput is the bottleneck. EX1003, ¶ 130. A POSITA would have had a reasonable expectation of success with such a modification because the TCP protocol allows for multiple

'772 Pet. at 59-61

This fails because Gamble does not disclose or suggest client "requests" for any subparts and cannot cure the fact that Leaning does not have a plurality of TCP connections, let alone request sub-parts over different connections. And Petitioner does not propose any modification to Leaning that might cure these deficiencies.

'772 POR at 44-47

The Gamble Combination Fails to Disclose "requesting sub-parts of the files … over different … connections"

Like Leaning, Gamble also does not disclose or suggest "***requesting sub-parts*** plurality of the files ***over different*** ones of the plurality of ***TCP connections***." '772 POR at 44-45.

> Furthermore, in Gamble, it is the ***transmitting*** client that establishes "parallel connections" for sending each segment to the receiving client (via that intermediate server). *Id.*, ¶¶[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 a plurality of TCP connections. Accordingly, Gamble fails to disclose or suggest "receiving" requests over a plurality of TCP connections, as claimed.

'772 POR at 46

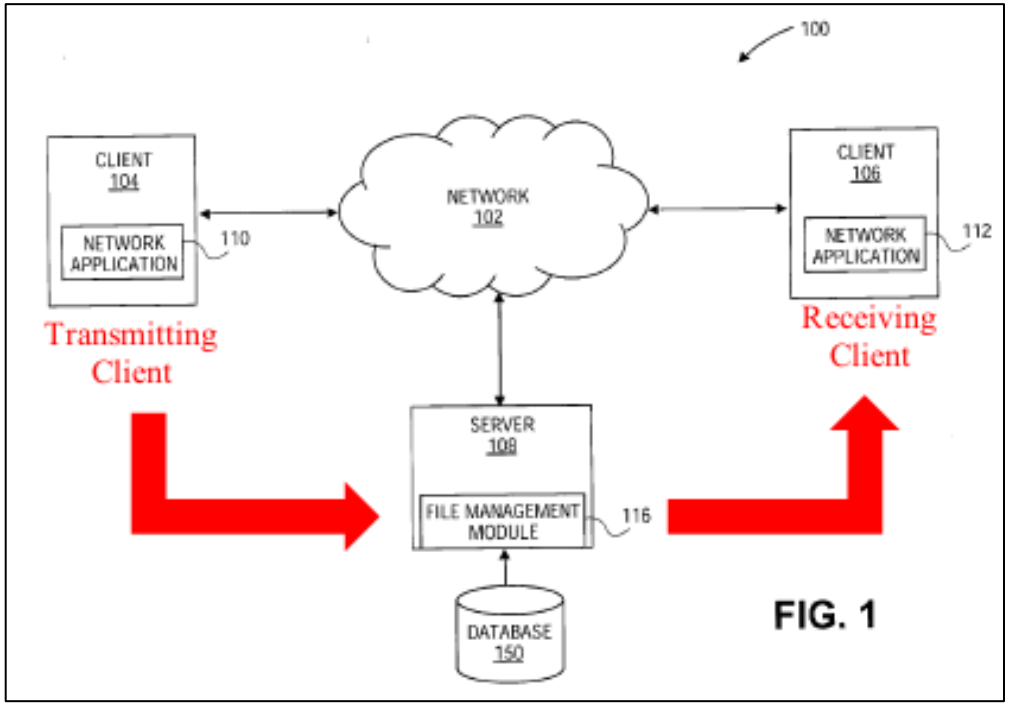
The Gamble Combination Fails to Disclose "Requesting…"

Dr. Jeffay identified that while Gamble discusses ***transmitting*** "segments" of a larger file over multiple "connections," Gamble fails to disclose or suggest "***requesting***" segments, files, or sub-files over a plurality of TCP connections***:***

1. The transmitting client establishes "parallel connections" for sending segments to receiving client

2. The transmitting client does not receive any segment requests from receiving client

3. Petition fails to account for intermediate server 108



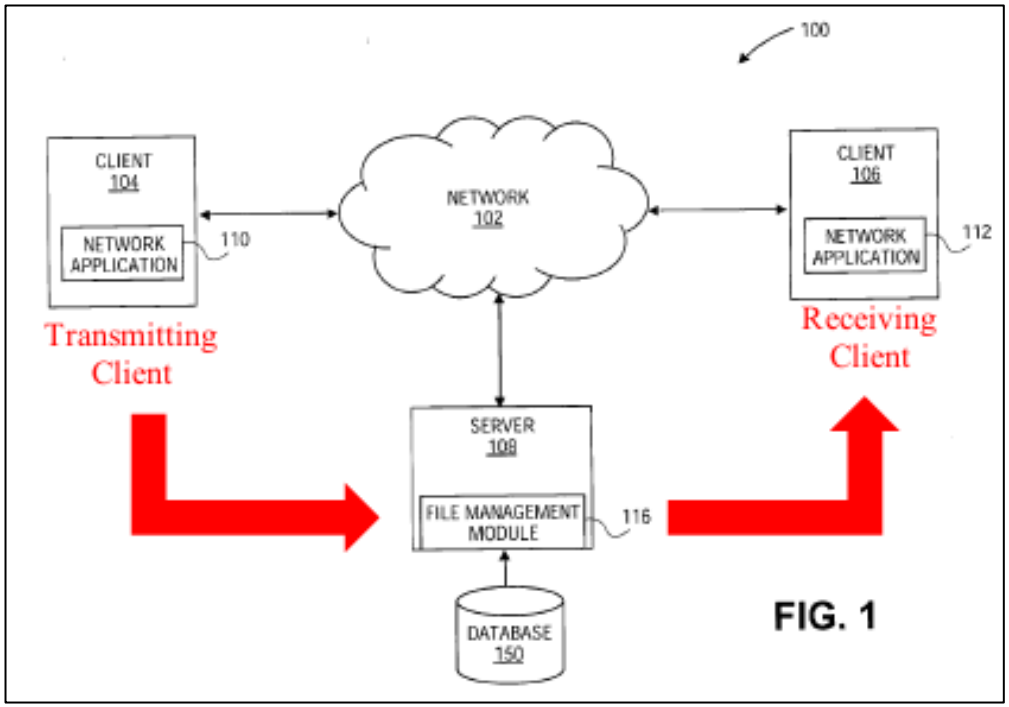
EX1020 at Fig. 1 (annotations added); '772 POR at 44-47; EX2141 (Jeffay Declaration), ¶174-175

The Gamble Combination Fails to Disclose "Requesting…"

Petitioner alleges in Reply that Gamble's transmitting client 104 "initiate[s] a standard TCP connection" and server 108 "listen[ing] for connection requests," '772 Reply at 17.

This fails because it confuses the roles of Gamble's transmitting client 104 and receiving client 106.

Transmitting client 104 sends data to the server, which then sends data to a different client (106); neither place "requests."
'772 Sur-Reply at 21.



EX1020 at Fig. 1 (annotations added)

The Ala-Honkola Combination Fails to Disclose "Requesting Sequential Streamlets" via Multiple Conns.

Petitioner alleges that a POSITA would have been motivated to modify Leaning to request subfiles via multiple TCP connections as taught by Ala-Honkola. '156 Pet. At 51.

But no reference discloses or suggests requesting streamlets over multiple TCP connections.

Leaning discloses requesting subfiles over a ***single*** TCP connection.

And Ala-Honkola only discloses requesting entire streams—***not streamlets or subfiles of a stream***—over multiple TCP connections.

'156 POR at 47-48.

VI. Objective Indicia of Non-Obviousness

Petitioner & Dr. Houh Failed to Address *Known* Objective Indicia

PO Sur-Reply, at 20-21

"***Known*** evidence of secondary considerations ***should be addressed in the Petition***." *Aardevo N. Am., LLC v. Agventure B.V.*, IPR2025-00136, Paper 9, 32 (P.T.A.B. May 1, 2025).

III. MATERIALS CONSIDERED

time of the alleged invention. Of the materials cited as an exhibit to the '772 patent IPR petition, I reviewed the following:

Exhibit Number	Description
1001	U.S. Pat. 8,868,772 ("the '772 Patent")
1002	File History of U.S. Pat. 8,868,772
1004	International P.C.T. Publication WO 2002049343 to Leaning et al. ("Leaning")
1007	U.S. Patent No. 6,848,004 to Chang ("Chang")
1008	WO1997044942 to Kliger ("Kliger")
1009	337-TA-1265 ITC Investigation Initial Determination

10

EX1003 (Houh Decl.) ¶21.

X. GRAHAM FACTORS (NO SECONDARY CONSIDERATIONS)

Petitioners submit that these findings are incorrect. First, Petitioners have not made any claims that prior use of the Move Media Player was an invalidating public use and thus the ALJ's findings regarding the concession that Move Media Player meets the claims does not apply to Petitioners.

Second, Petitioners disagree that the Move Media Player has a nexus to the '772 Patent because any of Move's success is not tied to unique characteristics of the claimed invention. As the prior art discussed in the Grounds above shows, the purportedly unique and successful aspects of the Move system that the ALJ relied on to find a nexus were already in existence in the prior art and thus cannot form the basis of any nexus to the claimed invention. *See Yita LLC v. MacNeil IP LLC*, 69 F.4th 1356, 1364 (Fed. Cir. 2023) ("[O]ur case law makes clear that objective evidence of nonobviousness lacks a nexus if it exclusively relates to a feature that

Petition, at 61-62.

All Relevant Exhibits From the ITC Are In the Record Here

PO Sur-Reply, at 22-23

Evidence Allegedly "not in this proceeding" (Reply, 19)	**Corresponding Exhibit Number in This Proceeding**
CX-0001C **(Direct Witness Statement of Drew Major)**	**Same evidence submitted through Declaration** of Drew Major (EX2020); **Petitioners have deposed Mr. Major** (EX1032).
RX-0001C **(Respondents' Witness Statement)**	**Concerned Confidential Infringement Evidence, Not Invalidity; Subject to Protective Order.**
CX-0008C **(Rebuttal Witness Statement of Kevin Jeffay, PhD.)**	**Same evidence submitted through Declaration** of Kevin Jeffay, Ph.D. (EX2141); **Petitioners have deposed Dr. Jeffay** (EX1027).
CX-1096C **(MOVE Networks Streaming Overview)**	**EX2022 (Same Document)**
CX-0005C **(Direct Witness Statement of Greg Smith)**	**Same evidence submitted through Declaration** of Greg Smith (EX2099); **Petitioners have deposed Mr. Smith** (Paper 39).
CX1061C **(Microsoft Unlocks the Power of the Web)**	**EX2055 (Same Document)**
CX-1134 **(MOVE, a Next-Gen Content Distribution Platform)**	**EX2033 (Same Document)**

Summary of Objective Indicia of Non-Obviousness

1) A Presumption of Nexus Is Warranted

   a) There Are No Critical Unclaimed Features

2) The Objective Indicia Are Tied to The Claimed Combination of Features

3) British Telecom's FastNets Product Confirms the Validity of the Challenged Patents

Summary of Objective Indicia of Non-Obviousness

1) **A Presumption of Nexus Is Warranted**

   a) There Are No Critical Unclaimed Features

2) The Objective Indicia Are Tied to The Claimed Combination of Features

3) British Telecom's FastNets Product Confirms the Validity of the Challenged Patents

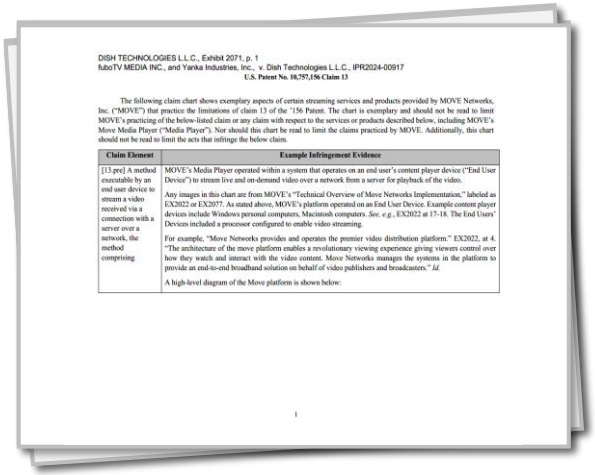
The ITC Correctly Found a Presumption of Nexus Applies

POR, at 49-51;
PO Sur-Reply, at 23-24.

In contrast, Dr. Jeffay demonstrated through corroborating evidence that Move's success is tied to the "unique characteristics of the claimed invention." *See Fox Factory*, 944 F.3d at 1373-74. As Dr. Jeffay testified, the Move system was described as early as 2008 as offering " a smooth end user experience as the Move Media Player up-shifts and down-shifts in response to

In view of this record evidence, I find DISH is entitled to a presumption that there is a nexus between the objective evidence of non-obvious DISH proffers and the claimed invention. I find respondents have not rebutted that presumption.

EX1009 at 213
(ITC Decision)

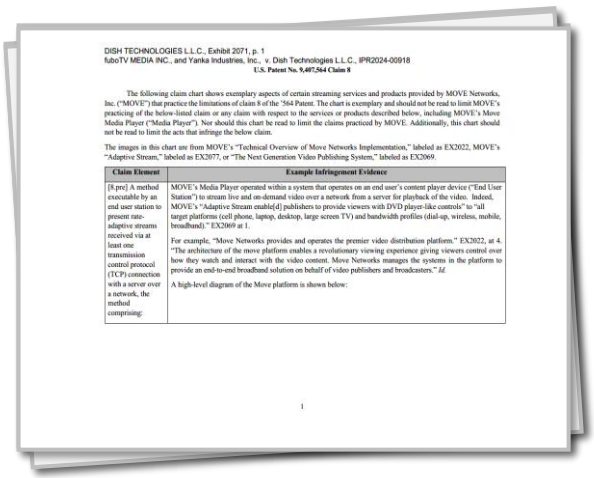


DISH TECHNOLOGIES L.L.C., Exhibit 2071, p. 1
fuboTV MEDIA INC., and Yanka Industries, Inc., v. Dish Technologies L.L.C., IPR2024-00917
U.S. Patent No. 10,757,156 Claim 13

The following claim chart shows exemplary aspects of certain streaming services and products provided by MOVE Networks, Inc. ("MOVE") that practice the limitations of claim 13 of the '156 Patent. The chart is exemplary and should not be read to limit MOVE's practicing of the below-listed claim or any claim with respect to the services or products described below, including MOVE's Move Media Player ("Media Player"). Nor should this chart be read to limit the claims practiced by MOVE. Additionally, this chart should not be read to limit the acts that infringe the below claim.

Claim Element	Example Infringement Evidence
[13.pre] A method executable by an end user device to stream a video received via a connection with a server over a network, the method comprising	MOVE's Media Player operated within a system that operates on an end user's content player device ("End User Device") to stream live and on-demand video over a network from a server for playback of the video. Any images in this chart are from MOVE's "Technical Overview of Move Networks Implementation," labeled as EX2022 or EX2077. As stated above, MOVE's platform operated on an End User Device. Example content player devices include Windows personal computers, Macintosh computers. *See, e.g.*, EX2022 at 17-18. The End Users' Devices included a processor configured to enable video streaming. For example, "Move Networks provides and operates the premier video distribution platform." EX2022, at 4. "The architecture of the move platform enables a revolutionary viewing experience giving viewers control over how they watch and interact with the video content. Move Networks manages the systems in the platform to provide an end-to-end broadband solution on behalf of video publishers and broadcasters." *Id.* A high-level diagram of the Move platform is shown below:

EX2071 ('156 Claim 13 Chart)



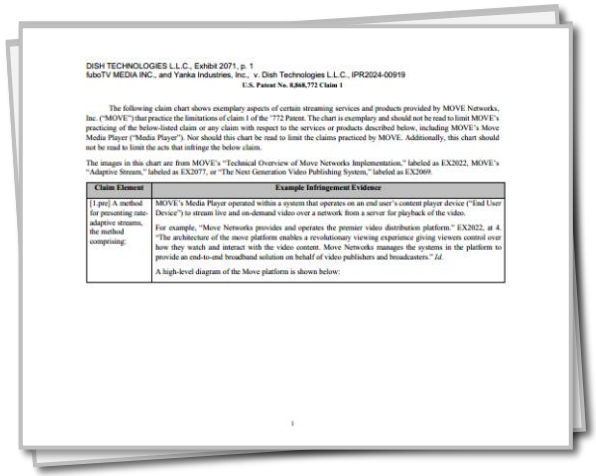
DISH TECHNOLOGIES L.L.C., Exhibit 2071, p. 1
fuboTV MEDIA INC., and Yanka Industries, Inc., v. Dish Technologies L.L.C., IPR2024-00918
U.S. Patent No. 9,407,564 Claim 8

The following claim chart shows exemplary aspects of certain streaming services and products provided by MOVE Networks, Inc. ("MOVE") that practice the limitations of claim 8 of the '564 Patent. The chart is exemplary and should not be read to limit MOVE's practicing of the below-listed claim or any claim with respect to the services or products described below, including MOVE's Move Media Player ("Media Player"). Nor should this chart be read to limit the claims practiced by MOVE. Additionally, this chart should not be read to limit the acts that infringe the below claim.

The images in this chart are from MOVE's "Technical Overview of Move Networks Implementation," labeled as EX2022, MOVE's "Adaptive Stream," labeled as EX2077, or "The Next Generation Video Publishing System," labeled as EX2069.

Claim Element	Example Infringement Evidence
[8.pre] A method executable by an end user station to present rate-adaptive streams received via at least one transmission control protocol (TCP) connection with a server over a network, the method comprising:	MOVE's Media Player operated within a system that operates on an end user's content player device ("End User Station") to stream live and on-demand video over a network from a server for playback of the video. Indeed, MOVE's "Adaptive Stream enable[d] publishers to provide viewers with DVD player-like controls" to "all target platforms (cell phone, laptop, desktop, large screen TV) and bandwidth profiles (dial-up, wireless, mobile, broadband)." EX2069 at 1. For example, "Move Networks provides and operates the premier video distribution platform." EX2022, at 4. "The architecture of the move platform enables a revolutionary viewing experience giving viewers control over how they watch and interact with the video content. Move Networks manages the systems in the platform to provide an end-to-end broadband solution on behalf of video publishers and broadcasters." *Id.* A high-level diagram of the Move platform is shown below:

EX2071 ('564 Claim 8 Chart)



DISH TECHNOLOGIES L.L.C., Exhibit 2071, p. 1
fuboTV MEDIA INC., and Yanka Industries, Inc., v. Dish Technologies L.L.C., IPR2024-00919
U.S. Patent No. 8,868,772 Claim 1

The following claim chart shows exemplary aspects of certain streaming services and products provided by MOVE Networks, Inc. ("MOVE") that practice the limitations of claim 1 of the '772 Patent. The chart is exemplary and should not be read to limit MOVE's practicing of the below-listed claim or any claim with respect to the services or products described below, including MOVE's Move Media Player ("Media Player"). Nor should this chart be read to limit the claims practiced by MOVE. Additionally, this chart should not be read to limit the acts that infringe the below claim.

The images in this chart are from MOVE's "Technical Overview of Move Networks Implementation," labeled as EX2022, MOVE's "Adaptive Stream," labeled as EX2077, or "The Next Generation Video Publishing System," labeled as EX2069.

Claim Element	Example Infringement Evidence
[1.pre] A method for presenting rate-adaptive streams, the method comprising:	MOVE's Media Player operated within a system that operates on an end user's content player device ("End User Device") to stream live and on-demand video over a network from a server for playback of the video. For example, "Move Networks provides and operates the premier video distribution platform." EX2022, at 4. "The architecture of the move platform enables a revolutionary viewing experience giving viewers control over how they watch and interact with the video content. Move Networks manages the systems in the platform to provide an end-to-end broadband solution on behalf of video publishers and broadcasters." *Id.* A high-level diagram of the Move platform is shown below:

EX2071 ('772 Claim 1 Chart)

MOVE's Player Provided Continuous Playback of Video

POR, at 47-48, 51-52, 54, 57, 58, 61-70;
PO Sur-Reply, at 26-28

63

So it's -- it's a lot more -- you -- you -- you're -- you're talking a very -- very simple case, which is kind of core, but -- but we did a whole bunch of other things, very clever, around that to -- to -- again, to guarantee that the playback was smooth and as highest quality as we could, but we could deal with pretty much whatever the internet threw at us in terms of losing -- occasionally losing some bandwidth.

Q. Understood.

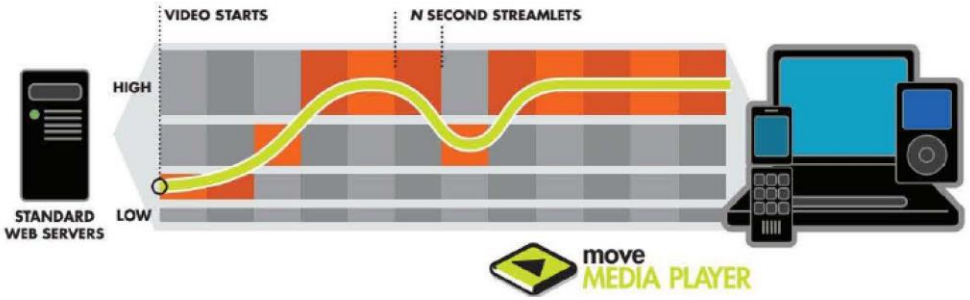
EX1032, 63 (Major Dep. Tr.)

The Sports Page: ESPN 360 Relaunches With Move

"The interface is simple, user-friendly, and extremely quick…On a slow wireless connection, I was able to get a relatively good looking picture and more importantly, an entirely fluid stream."

"One of the most impressive features of the player is the tv-like speed of switching between games. The video is immediately available, ramping up in the first few seconds to the best quality possible for a given end user. And on a really high-speed connection, I would imagine it looks pretty amazing in full screen."

EX2040 (ESPN 360 Article)



Petitioners' Hyper-Focus on Speculative "Blips" and "Stalls"

PO Sur-Reply, at 25-28

Q. Okay. So your technology doesn't ensure that viewers will never experience buffering or stalling, correct?

MR. GUY: Objection, form.

THE WITNESS: Yeah, we can't -- I -- can't ensure it. Just like cable and satellite, you can get pixelization and see little black dots. It -- there's -- it's number of nines imperfection that were -- we have a lot of. We had way more than anyone else had. In terms of all the things we did to guarantee, we did some very clever and hard things to, hell or high water, try and keep the video continuous and -- yet quality. We did way more than anyone else was

EX1032, 127 (Major Dep. Tr.)

Q. And so Move's technology was attempting to provide reliable video

viewing over the internet, but it wasn't required.

Do you agree?

MR. SHEPARD: Objection. Form.

A. I don't agree with the way it was -- you are saying it because no technology is 100 percent reliable. So every patent in that way in my view would be unreliable. Like nothing is reliable -- right? Your car is going to break down. Everything else. All those components are patentable. So it was trying to accomplish reliability. If it was able to do so with absolute perfection, then, great. But to my knowledge, I have never seen a technology or anything that man has created that is perfect.

EX1032, 217 (Major Dep. Tr.)

Petitioners' Hyper-Focus on Speculative "Blips" and "Stalls"

PO Sur-Reply, at 25-28

Q. Okay. You did say in your deposition that the MOVE Network's Viewer would prevent the stream from buffering. Is that right?

A. Yes.

Q. Does that mean that there was never any buffering at all for any viewers who ever looked at the MOVE Network stream?

MR. LYNN: Objection. Form.

A. No. That's -- I mean, obviously, if a network connection completely failed, there would definitely be buffering.

EX1034, 53 (Mitchell Dep. Tr.)

EX1034, 71 (Mitchell Dep. Tr.)

At the time in 2006, was your technology so improved that literally no one who was using your technology would experience freezing?

A. No.

MR. SHEPARD: Objection. Form.

A. The answer is no. Just like today. I still can't watch satellite TV sometimes. I mean, I don't know what the point of the thing is. No technology is perfect.

EX1032, 113 (Ericson Dep. Tr.)

Q. Would you also agree that the MOVE player's video playback would sometimes be interrupted as a result of buffering?

MR. LYNN: Objection. Form.

A. I mean, as I stated before, in certain cases -- certain extreme cases, that is a possibility. Just like --

The ITC's Presumption of Nexus Is Not Due To A "Concession"

POR, at 51;
PO Sur-Reply, at 23

The ITC Explicitly Cited to Evidence Explaining How MOVE's Media Player And Sling TV Embody the Claimed Invention

> DISH argues that it is entitled to a presumption of nexus because the product it relies on, the Move Media Player, is "the invention disclosed and claimed" and is coextensive with the asserted claims. *See* Compls. Br. at 232-33 (quoting *Fox Factory*, 944 F.3d at 1373). The inventors listed on the asserted patents worked for a company called Move, which was later acquired by DISH. CX-0001C (Major DWS) Q/A 3, 13. DISH argues that respondents and the Staff have conceded that the Move Media Player embodies the claimed invention because those parties argued that public use of the Move Media Player in 2005 was an invalidating use meeting every element of the asserted claims. *See id.* at 233; *infra* Sec. XIV.C.
>
> I find that the Move Media Player embodies the claimed invention. *See* Compls. Br. at 232-36; Resps. Br. at 232-41. Accordingly, DISH is entitled to a presumption that the commercial

EX1009 (ITC Decision), at 212.

The ITC's Nexus Findings Are Not Due To A "Concession"

POR, at 51;
PO Sur-Reply, at 23

The ITC Explicitly Relied On The Same Evidence Showing The Objective Indicia is Tied to the Claimed Invention

EX2103

b) Long-Felt But Unresolved Need and Failure of Others

Respondents argue that adaptive bitrate streaming was known and in use prior to the priority dates of the asserted patents. *See* Resps. Br. at 242 (citing RX-0001C (Richardson DWS)

The record evidence demonstrates a long-felt but unresolved need for improved Internet streaming, and that others failed to provide the requisite streaming performance. RealNetworks broadcasts were "too choppy and too fuzzy, with a viewing window far too small to enjoy." CX-1151 (Baseball Tests Online Broadcasts). Other streaming protocols at the time, like Adobe's Flash, were "broken" even with "enough bandwidth." CX-1047C (Email 5.15.07). Similarly, Microsoft had been working on adaptive streaming for years, but the record shows that customer Disney preferred Move's Media Player over Microsoft's Silverlight, which failed to natively adap to network conditions. JX-0073C (Carper Dep.) at 26:5-16, 35:15-23, 36:24-37:14; CX-1050C (Email 11.26.07); JX-0062C (Major Dep.) at 186:10-188:7.

(Email 11.26.07); JX-0062C (Major Dep.) at 186:10-188:7.

I thus find that DISH has demonstrated long-felt but unresolved need and failure of others.

EX2041

EX1009 (ITC ID), at 213-14.

The ITC's Nexus Findings Are Not Due To A "Concession"

POR, at 51;
PO Sur-Reply, at 23

The ITC Explicitly Relied On The Same Evidence Explaining How MOVE's Media Player Embodies the Claimed Invention

EX2032

c) Surprising Results

DISH argues that users expressed a substantial amount of surprise when they first experienced Move's technology. *See* Compls. Br. at 237-38 (citing CX-0008C (Jeffay RWS) at Q/A 342-43). Move's product was described as being "shockingly good," JX-0021, and one user stated that he was "a bit shocked to come home one night and find Lost streaming across a 19" flat-screen computer monitor in crisp, clear glory," JX-0023 ("Judging from the ABC site, the Move Networks stuff really works.").

above, I find that DISH has demonstrated a nexus between the Move Media Player and the asserted claims.

I find that DISH has adduced evidence demonstrating surprising results.

EX2041

EX1009 (ITC ID), at 214-15.

The ITC's Nexus Findings Are Not Due To A "Concession"

POR, at 51;
PO Sur-Reply, at 23

The ITC Explicitly Relied On The Same Evidence Explaining How MOVE's Media Player Embodies the Claimed Invention

EX2053

EX2130

EX2125

EX2142

d) Commercial Success

DISH argues that the Move Media Player has exhibited substantial commercial success.

See Compls. Br. at 238-41. By March 2008, viewership using Move Media Player rose to more than 34 million and users were averaging 50 minutes or more per session. CX-0008C (Jeffay [redacted]) at Q/A 357. By October 2008, both ESPN and ABC employed the Move Media Player to stream content on their websites. *See* CX-1105; CX-1132. In October 2010, [redacted] solicited a license to Move's ABR technology covered by the parent '783 application. CX-1061C. [redacted] invested in Move Networks in June 2007, CX-1071C, and DISH acquired Move in 2010, and used its technology to create Sling TV, a successful Internet streaming television platform, CX-0008C (Jeffay RWS) at Q/A 366. DISH has since licensed the asserted patents to [redacted]s. JX-0034C; JX-0033C.

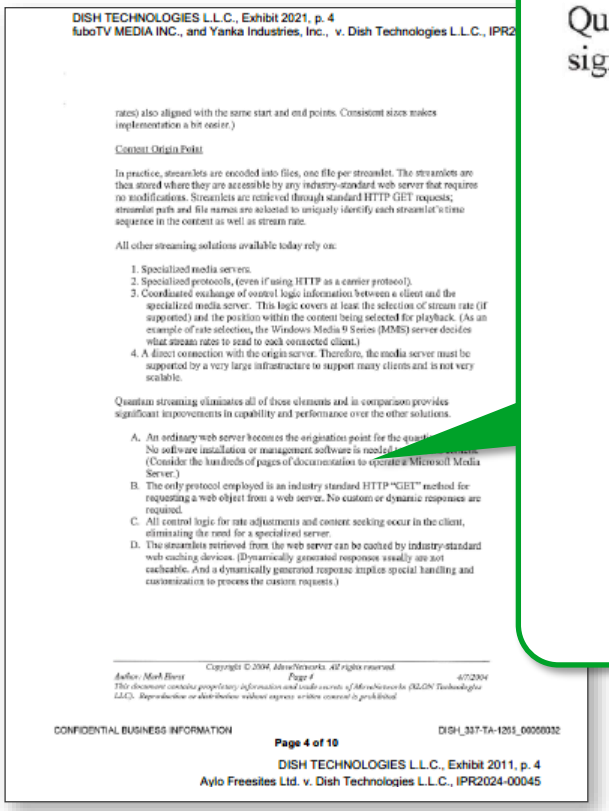
DISH has demonstrated a nexus between the Move Media Player and the asserted claims.

I find that DISH has adduced evidence demonstrating commercial success.

EX1009 (ITC ID), at 215.

Petitioners' "Unclaimed Features" Argument Is Conclusory and Unsupported

PO Sur-Reply, at 24-25



Quantum streaming eliminates all of those elements and in comparison provides significant improvements in capability and performance over the other solutions.

A. An ordinary web server becomes the origination point for the quantized content. No software installation or management software is needed to serve the content. (Consider the hundreds of pages of documentation to operate a Microsoft Media Server.)
B. The only protocol employed is an industry standard HTTP "GET" method for requesting a web object from a web server. No custom or dynamic responses are required.
C. All control logic for rate adjustments and content seeking occur in the client, eliminating the need for a specialized server.
D. The streamlets retrieved from the web server can be cached by industry-standard web caching devices. (Dynamically generated responses usually are not cacheable. And a dynamically generated response implies special handling and customization to process the custom requests.)

EX2021 (Streaming Media Technology, Inventor Hurst's White Paper)

Evidence From 2004 Sets Forth The Player's "Critical" Features

Summary of Objective Indicia of Non-Obviousness

1) A Presumption of Nexus Is Warranted

   a) **There Are No Critical Unclaimed Features**

2) The Objective Indicia Are Tied to The Claimed Combination of Features

3) British Telecom's FastNets Product Confirms the Validity of the Challenged Patents

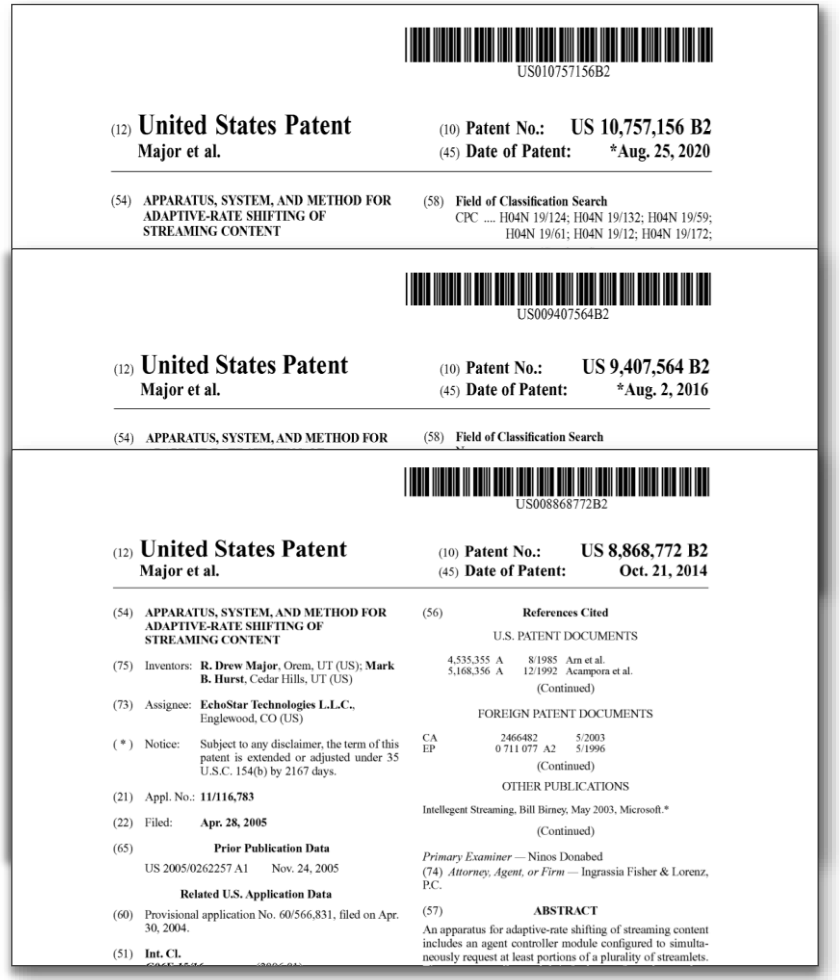
The Alleged "Critical Unclaimed Features" in the Ogdon IPRs Are Claimed Here

PO Sur-Reply, at 24-25

"Given that Petitioner has shown **multiple TCP connections to be a critical unclaimed feature of the MOVE Media Player** that is associated with a different patent (see Ex. 1027; Ex. 2011, 6; Ex. 2059, 11), we find that Petitioner has successfully rebutted any presumption of nexus."

Ogdon FWD, at 42-43.

Patent	Claim: Limitation
'156	Cl. 2: "wherein the apparatus is configured to establish **multiple [TCP] connections** with a content server, and request streamlets of varying bitrates."
'564	Cl. 2: "wherein the **at least one TCP connection comprises multiple [TCP] connections**."
'772	Cl. 1: "requesting by the media player a plurality of the files of one of the copies from the set of **servers over a plurality of … (TCP) connections**"



US010757156B2

(12) **United States Patent**
Major et al.

(10) **Patent No.: US 10,757,156 B2**
(45) **Date of Patent: *Aug. 25, 2020**

(54) **APPARATUS, SYSTEM, AND METHOD FOR ADAPTIVE-RATE SHIFTING OF STREAMING CONTENT**

(58) **Field of Classification Search**
CPC H04N 19/124; H04N 19/132; H04N 19/59; H04N 19/61; H04N 19/12; H04N 19/172;

US009407564B2

(12) **United States Patent**
Major et al.

(10) **Patent No.: US 9,407,564 B2**
(45) **Date of Patent: *Aug. 2, 2016**

(54) **APPARATUS, SYSTEM, AND METHOD FOR**

(58) **Field of Classification Search**

US008868772B2

(12) **United States Patent**
Major et al.

(10) **Patent No.: US 8,868,772 B2**
(45) **Date of Patent: Oct. 21, 2014**

(54) **APPARATUS, SYSTEM, AND METHOD FOR ADAPTIVE-RATE SHIFTING OF STREAMING CONTENT**

(75) Inventors: **R. Drew Major**, Orem, UT (US); **Mark B. Hurst**, Cedar Hills, UT (US)

(73) Assignee: **EchoStar Technologies L.L.C.**, Englewood, CO (US)

(*) Notice: Subject to any disclaimer, the term of this patent is extended or adjusted under 35 U.S.C. 154(b) by 2167 days.

(21) Appl. No.: **11/116,783**

(22) Filed: **Apr. 28, 2005**

(65) **Prior Publication Data**

US 2005/0262257 A1 Nov. 24, 2005

Related U.S. Application Data

(60) Provisional application No. 60/566,831, filed on Apr. 30, 2004.

(51) **Int. Cl.**

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(Continued)

Primary Examiner — Ninos Donabed
(74) *Attorney, Agent, or Firm* — Ingrassia Fisher & Lorenz, P.C.

(57) **ABSTRACT**

An apparatus for adaptive-rate shifting of streaming content includes an agent controller module configured to simultaneously request at least portions of a plurality of streamlets.

Petitioners' "Unclaimed Features" Argument Is Conclusory and Unsupported

PO Sur-Reply, at 24-25

"A patent challenger may not rebut the presumption of nexus with argument alone."

Quanergy Sys., Inc. v. Velodyne Lidar USA, Inc., 24 F.4th 1406, 1418 (Fed. Cir. 2022) (citing *WBIP, LLC v. Kohler*, 829 F.3d 1317, 1329 (Fed. Cir. 2016)).

PO's nexus arguments separately fail because PO's evidence ties the alleged secondary considerations to unclaimed features. As PO recognizes, "***The key***" to MOVE's success "***is in [MOVE's] plug-in***." POR51-52 (quoting EX2048).[7] But, PO omits the explanation for ***why*** the plug-in is key: it "manages delivery, assembles and renders the stream, and ***offers DRM [Digital Rights Management], geo-targeting, and extremely in-depth reporting***." EX2048 1; EX2022 27, 29-30; EX2031 1; EX2036 2; EX2039 1; EX2113 2-3; Houh2 §XVII.A.4; Jeffay 202:17-204:14 (ability to insert advertisements an "essential feature"). These unclaimed features don't permit a finding of nexus.

Petitioners' Reply, at 22

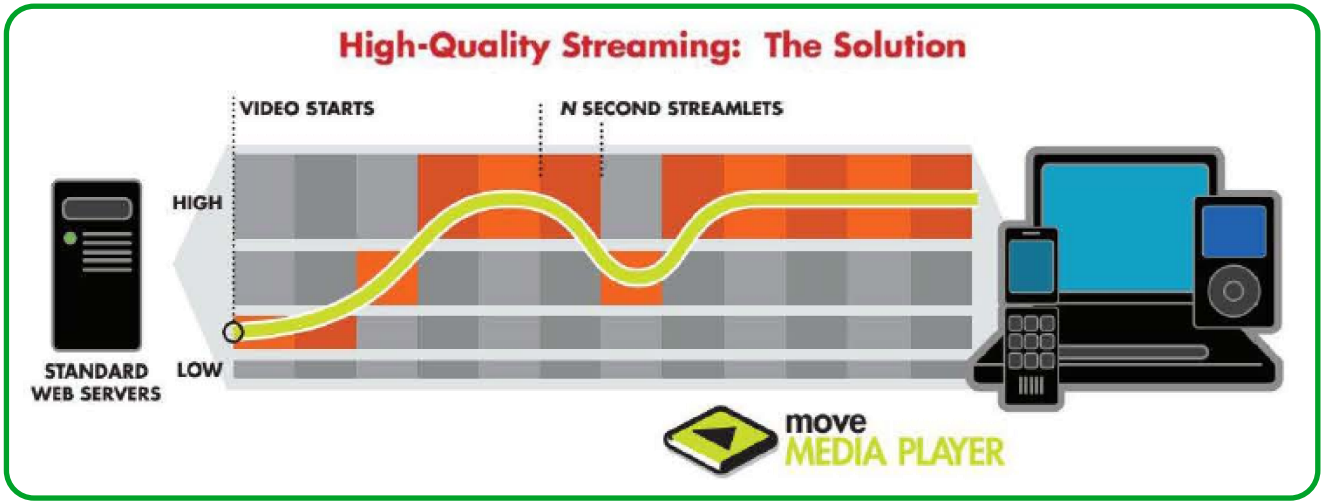
Petitioners' One Paragraph of Argument Is Insufficient

Petitioners' "Unclaimed Features" Argument Is Conclusory and Unsupported

POR, at 54-57;
PO Sur-Reply, at 24-25



EX2077, 1 (MOVE Adaptive Stream)

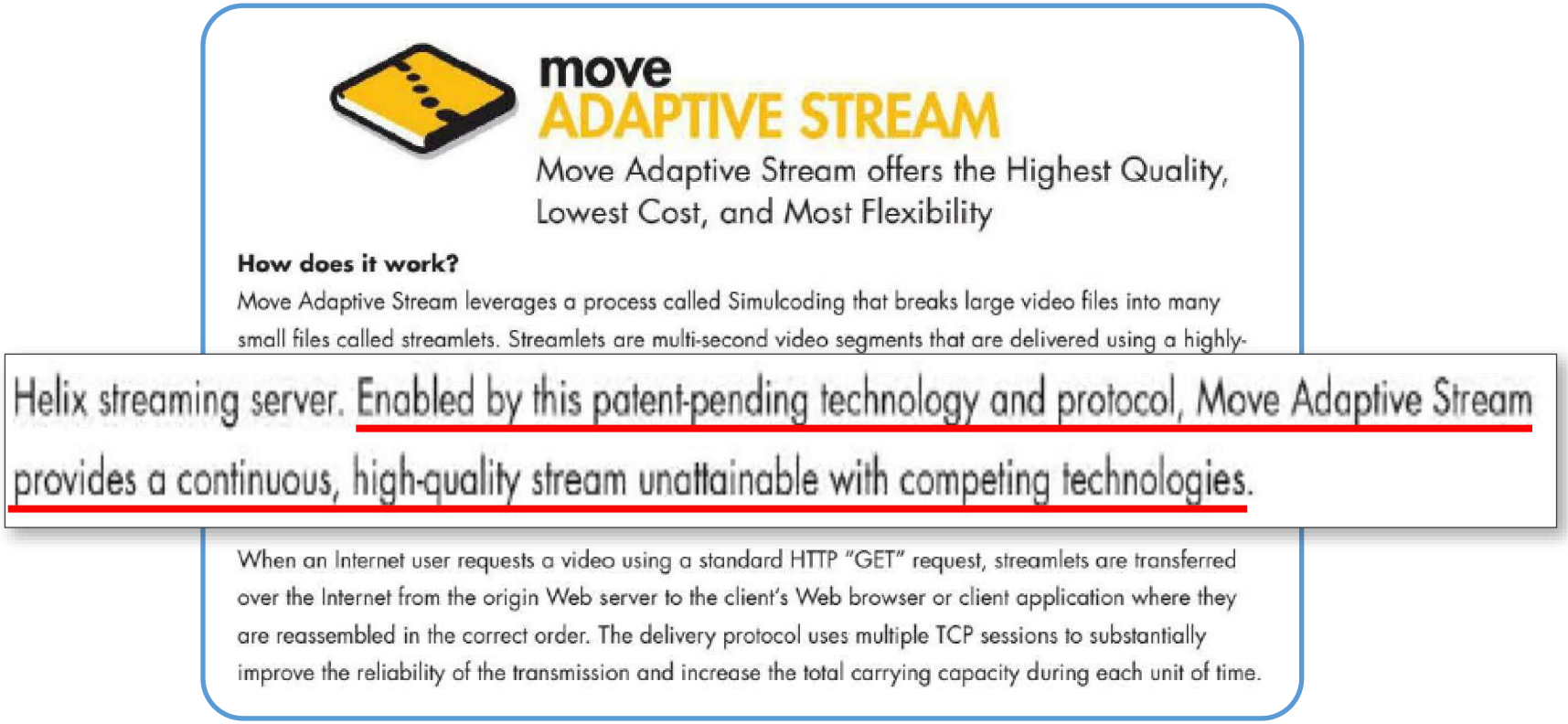


EX2077, 1-2 (MOVE Adaptive Stream)

MOVE's Player Addressed Then-Present Issues With Continuity

Petitioners' "Unclaimed Features" Argument Is Conclusory and Unsupported

PO Sur-Reply, at 24-25



move
ADAPTIVE STREAM

Move Adaptive Stream offers the Highest Quality, Lowest Cost, and Most Flexibility

How does it work?

Move Adaptive Stream leverages a process called Simulcoding that breaks large video files into many small files called streamlets. Streamlets are multi-second video segments that are delivered using a highly-

Helix streaming server. Enabled by this patent-pending technology and protocol, Move Adaptive Stream provides a continuous, high-quality stream unattainable with competing technologies.

When an Internet user requests a video using a standard HTTP "GET" request, streamlets are transferred over the Internet from the origin Web server to the client's Web browser or client application where they are reassembled in the correct order. The delivery protocol uses multiple TCP sessions to substantially improve the reliability of the transmission and increase the total carrying capacity during each unit of time.

EX2077, 1-2 (MOVE Adaptive Stream)

MOVE's Player Worked Without DRM/Geo-Tagging/Ad-Insertion

PO Sur-Reply, at 24-25

MOVE's Media Player Functioned Without DRM; AND Integrated Into Other DRM Systems

Microsoft invests in Net video company Move Networks

In March, Microsoft said it would begin supporting Move Network's video streaming technology within its own cross-browser video platform, Silverlight, which lets publishers customize navigation and ads. As part of Monday's deal, Move Networks said it will support Windows Server-based encoding, Microsoft video-compression technology (codecs), and Silverlight's digital rights management (DRM).

EX2068 (Industry Article)

With Move Adaptive Stream's client-side control, the publisher can extract useful feedback such as how many users watched which videos and how long they watched. The client records quality issues related to start times, pauses, stalling interruptions, and delivery speed. Advertisers also benefit from knowing the demographic of the viewership and knowing how many times their ads were viewed, rather than knowing only a count of how many times the server delivered an ad to the client. Furthermore, feedback reports can be received in near-real

EX2069 (MOVE Networks Publishing System)

To the Ends of the Earth

Through bleeding-edge technology pioneered by alumni John W. Edwards (BS '87) and R. Drew Major (BS '80) (a founder of Novell), both channels are available to anyone with an Internet connection, anywhere in the world.

BYU Television and BYU Television International are the only TV channels on the Web that stream nonstop, day in and day out, with a reach that spans the globe.

EX2061 (BYU Article)

Petitioners' "Unclaimed Features" Are Advantages Unlocked by MOVE's Technology

PO Sur-Reply, at 24-25



Move's trick, as described to me today by Jim Ericson, VP of marketing, is to deliver video as a standard web object, cached in small bits. This borrows some aspects of peer-to-peer, but is friendlier to ISPs. Move doesn't use special media servers, and adjusts the video quality based on available bandwidth. The streaming is made possible using a small applet that users must download to the browser.

Benefits to the viewer: no buffering, no stalling, and backwards and forwards navigation within a live stream, high-quality video. Benefits to the content owner: cheaper, detailed reporting, high-quality video.

EX2031, 1 (MOVE Networks Makes TV Watchable)

What are the advantages?

Move Adaptive Stream offers dramatic advantages over traditional streaming. It provides more than a new protocol for streaming. Move Adaptive Stream provides a better way to publish and experience video on the Internet. The advantages can be grouped into five categories that correlate with the streaming process:

- **Encoding** – preparing the video for transmission.
- **Transmission** – delivering the video from the "origin server" to the target playback device.
- **Client Controls and Playback** – the user experience.
- **Scalability** – accommodating large numbers of users.
- **Publisher Feedback and Administration** – measuring and monetizing the video.

EX2077, 2 (MOVE Adaptive Stream)

Petitioners' "Unclaimed Features" Are Advantages Unlocked by MOVE's Technology

PO Sur-Reply, at 24-25

> ***targeting, and extremely in-depth reporting.***" EX2048 1; EX2022 27, 29-30; EX2031 1; EX2036 2; EX2039 1; EX2113 2-3; Houh2 §XVII.A.4; Jeffay 202:17-



DISH TECHNOLOGIES L.L.C., Exhibit 2113, p. 3
fuboTV MEDIA INC., and Yanka Industries, Inc., v. [illegible]sh Technologies L.L.C., IPR2024-00919

a leading provider of advanced video delivery services. A[illegible]B 2008, Move Networks Inc. is demonstrating a technology preview of Silverlight-based [illegible]e branding and navigation elements within, around and on top of Move Networks' v[illegible]chnology.

New Microsoft Content Protection Support in Silverli[illegible]reases Opportunities for Vibrant Content Marketplace

Silverlight-based content delivery can be protecte[illegible] variety of techniques, including Web and streaming playlists, authentication, au[illegible], stream encryption and digital rights management (DRM). Today Microsoft unveiled details of Silverlight DRM, Powered by PlayReady, the content protection support coming later this year in Silverlight.

Technicolor have announced their support for the content protection solution to be provided in Silverlight, due to the technology's proven foundation and support.

"As the dynamics of content distribution continue to accelerate toward the Internet, we need a flexible technology platform that allows us to explore a broad scope of business models and rich user experiences for digital distribution of Paramount Pictures' wide array of content,"

3 of 6

CONFIDENTIAL BUSINESS INFORMATION, SUBJECT TO PROTECTIVE ORDER MSFT_FITNESS_ITC_000363

Page 3 of 6

EX2113 (New Support For Silverlight), at 3

Petitioners' Cited Evidence Confirms These Features Are Not Critical to MOVE's Player

Summary of Objective Indicia of Non-Obviousness

1) A Presumption of Nexus Is Warranted

   a) There Are No Critical Unclaimed Features

2) The Objective Indicia Are Tied to The Claimed Combination of Features

3) British Telecom's FastNets Product Confirms the Validity of the Challenged Patents

Absent the Presumption, Nexus is Tied to The Claimed Combination

POR, at 54-61;
PO Sur-Reply, at 26

Move's Player Accomplished What Others Could Not

Generally, the quality, fluidity and reliability of most broadband streaming has rarely ever matched that of typical cable, DBS or terrestrial television. Yet ABC/Disney is counting on a lot of consumers getting into the habit of thinking last night's missed episode of "Boston Legal" is only a few mouse clicks away—and that the simple process of viewing it in long form via streaming will be both uneventful and positive. Adding HD to the experience is designed to push the habit-changing experience a bit further along.

from Move Networks.

EX2050 (Industry Article)

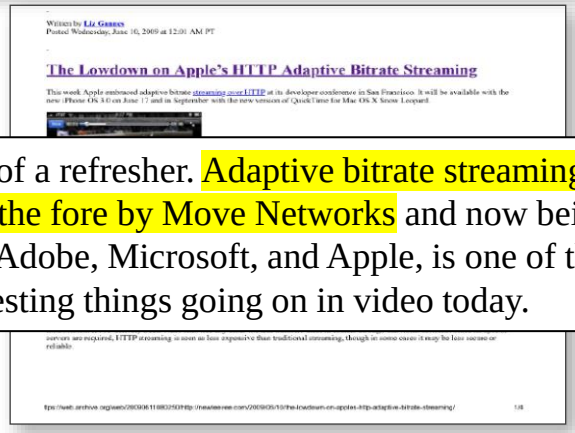
High-Quality Streaming: The Problem

Viewers are used to high-quality viewing, and they want it online too. Unfortunately, anyone who has tried knows that current streaming technologies are fraught with problems—including delayed starts, poor video quality, and long buffering interruptions. Additionally, the size of most streaming video frames is too small

EX2077
(MOVE Adaptive Stream)



EX2047 (NYT Article)



First, a bit of a refresher. Adaptive bitrate streaming, brought to the fore by Move Networks and now being pushed by Adobe, Microsoft, and Apple, is one of the more interesting things going on in video today.

EX2041 (E-Mail from Level-3 to MOVE)

DISH's MOVE Player Success Lay In The Claimed Combination Of Features

POR, at 51-52, 57-58;
PO Sur-Reply, at 25-27

"[I]t is the claimed combination ***as a whole***"–not any single element–"that serves as a nexus for the objective evidence." PO Sur-Reply, at 25 (citing *WBIP*, 829 F.3d at 1330).

"[T]here are a lot of components to make the technology work as a solution in the player, how you prepare the content, how you—how it's requesting content over the TCP/IP network, the "GET" requests. How there's profiles that are decided with audio, video, how to decide the length of those to achieve maximum quality. How to decide the size of those from a profile to ensure the continuous playback.

[***]

There are lots of things that are part of the MOVE solution that ensures … minimizing buffering [and] latency."

EX1030 (D. Ericson (MOVE's VP of Engineering) Dep. Tr.), 165:13-166:2

"[Y]ou're talking a very – very simple case, which is kind of core, but – but [MOVE] did a whole bunch of other things, very clever, around that to – to again, to guarantee that the playback was smooth and as highest quality as we could."

EX1033 (Major (MOVE Founder/Inventor) Dep. Tr.), 62:2-8

According to a Move Networks press release,

"The seminal patent covers the encoding and use of multiple bit rate 'streamlets' with the same time index; such that the aggregate set of streamlets, stored on standard web servers, independently yield playback of the original full length video. This is accomplished through intelligent requests of successive unique optimal streamlets sent by a client device."

EX2062 (MOVE Awarded Fundamental Streaming Patent Article)

DISH's MOVE Player Success Lay In The Claimed Combination Of Features

POR, at 51-54;
PO Sur-Reply, at 23

Move Networks and the Quality Solution

"On one side are the Verizons of the world installing fiber to IPTV over a closed network. On the other side are those developing new codecs and technologies to leverage existing networks and deliver a broadcast-like experience over the Internet. MOVE Networks is focused on this latter area, improving what they call the 'quality of experience' for online media delivery over public networks."

"But the key is in [MOVE's] plug-in … MOVE's adaptive protocol means that the plug-in can determine the best encoding profile for a user based on available bandwidth."

EX2048
(Industry Article)

Move Over, Joost

"MOVE's innovative peer-to-peer video delivery platform lets professional content publishers stream … in a full-screen, broadcast-quality format."

"MOVE's bottom-line technology advantage: its service is profoundly more efficient and less expensive, and it provides a dramatically better viewing experience."

EX2036 (Industry Article), at 2

Level 3 Collaborates With Move Networks to Provide 'True' HD Streaming

"Level 3's Move-enabled streams will dynamically adapt to changing network and end-user computer conditions."

"With the Move Media Player, customers know…the viewers of their content will always be able to watch the video stream on whatever computer they are using."

EX2039 (Industry Article)

MOVE's Success Lay In The Claimed Combination Of Features

POR, at 53-54

Online HD: Coming Faster Than You Think

I think that several technologies are coming together to speed up the high-def experience. What are they?

Client Technology. Media standards such as Adobe Flash, Microsoft's Windows Media, and Apple Quicktime have been upgraded lately to improve the way that rich media is handled and streamed. Or, in some, cases, people like Move Networks have built an embedded client for their content provider

EX2037 (Industry Article)

The Sports Page: ESPN 360 Relaunches With Move

"The interface is simple, user-friendly, and extremely quick…On a slow wireless connection, I was able to get a relatively good looking picture and more importantly, an entirely fluid stream."

"One of the most impressive features of the player is the tv-like speed of switching between games. The video is immediately available, ramping up in the first few seconds to the best quality possible for a given end user. And on a really high-speed connection, I would imagine it looks pretty amazing in full screen."

EX2040 (ESPN 360 Article)

MOVE Networks Makes Web TV Watchable

MOVE's trick…is to deliver video as a standard web object, cached in small bits. This borrows some aspects of peer-to-peer, but is friendlier to ISPs. Move doesn't use special media servers, and adjusts the video quality based on available bandwidth. The streaming is made possible using a small applet that users must download to the browser.

EX2031 (Industry Article)

Long-Felt Need But Failure of Others

POR, at 53;
PO Sur-Reply, at 26-27

Other Providers Could Not "Get The Results" MOVE Got

From: Taylor, Mark [mailto:Mark.Taylor@Level3.com]
Sent: Thursday, May 10, 2007 5:52 PM
To: jedwards@movenetworks.com
Cc: Gips, Don; Lepard, Cecil
Subject: Follow up

John

Thank you for the time you and your team gave us today. We really appreciated it very much. As discussed I'll follow up directly with an outline of potential collaboration areas.

I have a couple of follow up questions/requests;

1. Could I have an electronic copy of the presentation please?

2. We discussed the patent applications in the meeting. Our patent lawyer has done a search already

- other than the effect. Whether intentional or not the switch from your streaming to the Flash ad was in itself an ad for you! But, in your opinion why are the current streaming protocols broken? There is enough bandwidth but they cannot get the results you do. How long do you think it takes

- other than the effect. Whether intentional or not the switch from your streaming to the Flash ad was in itself an ad for you! But, in your opinion why are the current streaming protocols broken? There is enough bandwidth but they cannot get the results you do. How long do you think it takes

ONFIDENTIAL BUSINESS INFORMATION DISH_337-TA-1265-GS_00001036

Page 1 of 2

DISH TECHNOLOGIES L.L.C., Exhibit 2031, p. 1
Aylo Freesites Ltd. v. Dish Technologies L.L.C., IPR2024-00045

EX2041 (E-Mail from Level-3 to Declarant J. Edwards)

MOVE's (and Later, Sling's) Emmy Award Recognizing MOVE's Technology

POR, at 68-69;
PO Sur-Reply, at 26-28

At the 71st annual Technology & Engineering Emmy Awards, **Sling TV** won the Emmy Award in the category of "Pioneering Development of Large Scale, Cloud Served, Broadcast Quality, Linear Channel Transmission" – April 19, 2020

EX2006 (Jeffay Declaration), ¶¶[217], [280]; EX2023 (Sling Emmy Article)
POR, at 47, 68, 69; PO Sur-Reply, at 26



"I know [this] because the MOVE assets that were acquired [by EchoStar] were literally the technology that Sling TV was running on. So it went from DISH Anywhere to Sling TV from MOVE Networks. We didn't like start from scratch. ***It was the exact same technology and deployed infrastructure that was the basis of all three***."

EX1030 (Ericson Dep.), 238:25-239:8

Industry Praise and Recognition is Voluminous

POR, at 67-70;
PO Sur-Reply, at 26-28



Move Networks
OnMedia 100 Winner

EX2028

Move Networks
Red Herring Global 100

EX2029

Move Networks
On Hollywood 100
Company Recognized for Leadership in Internet Television Technologies

EX2026

Move Networks
TechCrunchies Finalist

EX2030

Move Networks
OnHollywood 100 Winner

EX2027

Industry Praise and Recognition is Voluminous

POR, at 67-70;
PO Sur-Reply, at 26

"But the most awesome (I have probably never used that word in seven years of this site) online video feed is on the official Democratic Convention site, on DemConvention.com site. It is in HD, and uses Move Networks' plugin and using Microsoft Silverlight." **Rafat Ali, *Paid Content & Washington Post***

EX2091 (MOVE Company-Wide E-Mail)

"Meanwhile Move burnishes its reputation for high-quality delivery gained through deals with ABC, Discovery, Fox and others. These two are natural partners." **Will Richmond- *VideoNuze***

EX2091 (MOVE Company-Wide E-Mail)

"The deal also signals continued momentum for Move Networks, a supplier of high-definition video-delivery technology to publishers including ABC, Discovery, ESPN, and Fox" **–Stephanie Olson- *CNET***

EX2091 (MOVE Company-Wide E-Mail)

"The live, online webcast of the Democratic National Convention was the first large demonstration of the integration of Move Networks and Silverlight. **It was a technological success and tremendously popular, with visitors to the official convention Web site viewing more than 350,000 hours of video. It allowed viewers to experience the convention online like never before.**"

EX2070 (Microsoft 2008 Article)

Surprising Results and Praise

POR, at 61-62;
PO Sur-Reply, at 26

Unlike other peer-to-peer competitors such as BitTorrent and Joost, 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, and backwards and forwards navigation within a live stream while you're watching.

Move's bottom-line technology advantage: its service is profoundly more efficient and less expensive, and it provides a dramatically better viewing experience.

EX2036 at 2 (MOVE Over, Joost).

"ABC uses a player by Move Networks, which offers a much clearer picture quality … [I]t's clear that ABC has the superior product."

EX2053 (ABC Offering Full Screen Streaming HD Content).

The best news here is that while only a year ago one would have thought we would be waiting years to see viable streaming HD technology, it now appears to be coming faster than I thought.

I just got back from a trip to L.A., where I talked to a lot of people with insight into what's going on with technology that enables the content providers to more expediently delivery HD. There are many companies working to speed up HD downloads, including **Move Networks**, **FastSoft**, **Itiva**, and **BitGravity** (there are many more -- those just came of the top of my mind). Judging from the ABC site, the Move Networks stuff really works. I've also recently seen impressive demos by BitGravity and FastSoft.

EX2037 (Online HD: Coming Faster Than You Think).

Anatomy, *Ugly Betty*, and more, right on your computer screen. Until a few days ago, however, the picture was rather small. Now ABC.com has launched a new full-screen "HD-quality" video player, and the "broadcast" looks shockingly good.

EX2032 (ABC.com makes watching TV at work better).

MOVE's Commercial Success was Revolutionary

POR, at 62-65;
PO Sur-Reply, at 26-27

- **MOVE's player attracted strategic investors, including:**

- Microsoft (*see* EX2055, EX2068, EX2070)
- Steamboat Ventures (*see* EX2057)
- Level 3 Comm'cns. (*see* EX2039)
- Comcast (*see* EX2038)
- Cisco (*see* EX2024)
- Hummer Winblad Venture Partners (*see* EX2014)

- **MOVE's patents were, and still are, used to deliver content for:**

- FOX
- ESPN
- ABC
- Disney
- Oprah Book Club
- Televisa
- Democratic National Convention
- Comcast
- The CW
- ProSieben
- lululemon
- Peloton
- Univision Communications
- ViacomCBS
- iFit
- and more.

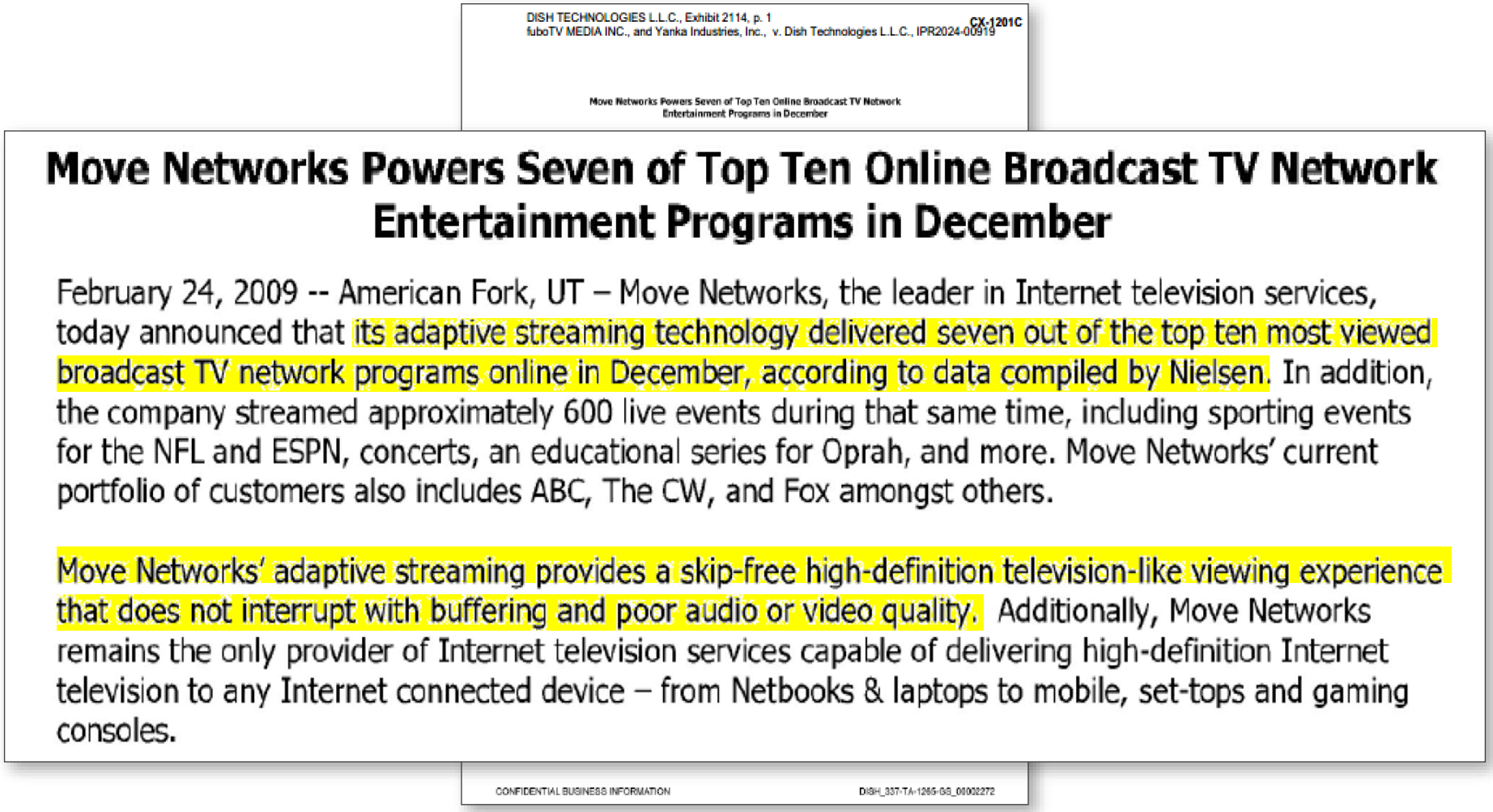
POR, at 61, 62; EX2038; EX2063; EX2083, EX2094, EX2095

Industry giants considered MOVE "a leader in HTTP-based video delivery" and that **MOVE helped them "a competitive edge in a crowded marketplace."**

EX2055 at 4

MOVE's Commercial Success was Revolutionary

PO Sur-Reply, at 26-27



DISH TECHNOLOGIES L.L.C., Exhibit 2114, p. 1
fuboTV MEDIA INC., and Yanka Industries, Inc., v. Dish Technologies L.L.C., IPR2024-00919
CX-1201C

Move Networks Powers Seven of Top Ten Online Broadcast TV Network Entertainment Programs in December

Move Networks Powers Seven of Top Ten Online Broadcast TV Network Entertainment Programs in December

February 24, 2009 -- American Fork, UT – Move Networks, the leader in Internet television services, today announced that its adaptive streaming technology delivered seven out of the top ten most viewed broadcast TV network programs online in December, according to data compiled by Nielsen. In addition, the company streamed approximately 600 live events during that same time, including sporting events for the NFL and ESPN, concerts, an educational series for Oprah, and more. Move Networks' current portfolio of customers also includes ABC, The CW, and Fox amongst others.

Move Networks' adaptive streaming provides a skip-free high-definition television-like viewing experience that does not interrupt with buffering and poor audio or video quality. Additionally, Move Networks remains the only provider of Internet television services capable of delivering high-definition Internet television to any Internet connected device – from Netbooks & laptops to mobile, set-tops and gaming consoles.

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DISH_337-TA-1265-GS_00002272

EX2114 (Seven of Top Ten Press Release)

Move's Player Fundamentally Changed Online Streaming

POR, at 55, 60-61;
PO Sur-Reply, at 26

"**[P]eople today are spending more than an hour per session watching content Move provides**. [John Edwards, CEO of Move Networks,] also said that the company has crossed the 34 million viewer mark. This is an increase from the 50-minute average viewing time and 20 million viewers Move announced in November.

[T]his means that viewers are sticking around for entire programs (and the ads)."

EX2074 (MOVE Crosses the Hour Threshold)

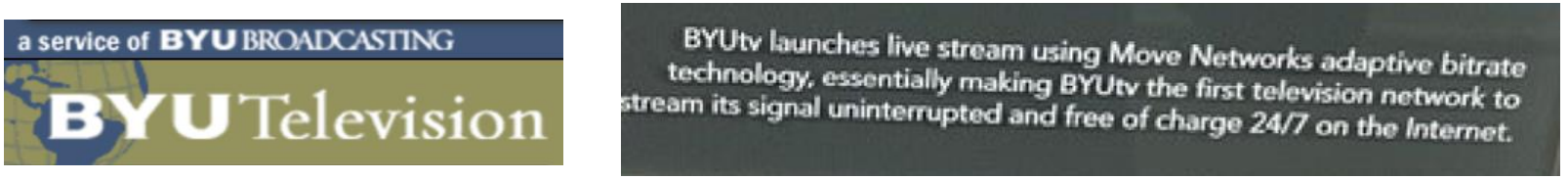
"**In the first year online after its founding in 2005, Move gained more than 35 million unique viewers**. The company **continues to add an additional 100,000 new unique viewers every day**, leading Move to become a valued partner of some of the largest streaming media companies."

"**Move's mantra is to 'put the mass back in mass media**.'"

EX2087 (MOVE Put Mass Back Into Mass Media)

Early Public Uses Highlighted the Novelty of Move's Player

PO Sur-Reply, at 27



EX2120
(BYU Plaque)

- "One of our early tests include[ed] streaming the bi-annual conference for the Church of Jesus Christ of Latter-Day Saints in October 2005. **We worked with Brigham Young University Television, BYU.tv, to stream the conference live over the Internet. Tens of thousands of people watched the conference live.** As a result, we proved our technology worked and no one was doing anything of this kind at the time." EX2020 (Major Declaration), ¶ 23.

- "Through bleeding-edge technology pioneered by alumni John W. Edwards (BS '87) and R. Drew Major (BS '80) (a founder of Novell), both [BYU.tv] channels are available to anyone with an Internet connection, anywhere in the world…**Move is at the forefront of the Web-television movement, with client-publishers like ABC, FOX, ESPN, and Disney—though not one of those networks maintains a station that airs online 24 hours a day, seven days a week. 'They are thinking about it, dreaming about it,' Edwards says, 'but BYU Television is doing is**.'" EX2061 (BYU Magazine Article) at 6.

- "The most-watched program on BYU Television, general conference first streamed online through Move Networks' servers in April 2006, **garnered hundreds of thousands of unique user sessions**. EX2061 (BYU Magazine Article) at 7.

Objective Evidence Supports Copying

POR, at 66-67;
PO Sur-Reply, at 26

"Following [Move's] market introduction in 2006, practically every major online video provider – including Akamai, Apple, Adobe, Limelight, Microsoft, Netflix, Widevine, and several others – has deployed an adaptive bit rate architecture inspired by our inspiration. We are pleased to see that the USPTO has recognized our technical achievements that make quality IP video delivery a reality."

EX2024 (MOVE Awarded Fundamental Pat.)

"**Adaptive bitrate streaming was brought to the fore by Move Networks and now being pushed by Adobe, Microsoft, and Apple**, is one of the more interesting things going on in video today."

EX2046 (The Lowdown on Apple)

"The most significant recognition of all, however, is that almost all video streaming that happens over the Internet today for live or on-demand content is based on the ` Adaptive Bitrate approach that we invented. The then-current state-of-the-art approaches used by others have been pretty much abandoned."

EX2020, ¶ 35

Objective Evidence Supports Copying

POR, at 66-67;
PO Sur-Reply, at 26

Microsoft Announces Smooth Streaming



From: Greg Smith [mailto:gsmith@movenetworks.com]
Sent: Monday, February 23, 2009 2:23 PM
To: Christopher Carper
Subject: Re: Smooth Streaming

Thanks. Fuel to the fire. Every time I get heads to cool even a little....

On 2/23/09 1:24 PM, "Christopher Carper" <ccarper@microsoft.com> wrote:

I just wanted to give you a heads up that today we will be announcing our smooth streaming beta. Here are the key messages that will go out with that announcement. [redacted]

C

Key Messages

- [redacted]
- Smooth Streaming delivers the best possible consumer media experience and revenue opportunity for content distributors [redacted]
- Get Started Today
  - See it in action, courtesy of CDN partner Akamai: http://www.smoothhd.com <http://www.smoothhd.com>
  - Download the Smooth Streaming beta extension: http://www.iis.net/media
  - Start encoding for Smooth Streaming with Microsoft Expression Encoder 2 SP1
  Learn more: www.microsoft.com/expression <http://www.microsoft.com/expression>
  Use the Silverlight 2 media player templates that ship with Expression Encoder 2 Service Pack1 (SP1) for a Smooth Streaming-enabled Silverlight media experience

DISH TECHNOLOGIES L.L.C., Exhibit 2057, p. 1
Aylo Freesites Ltd. v. Dish Technologies L.L.C., IPR2024-00045
CONFIDENTIAL BUSINESS INFORMATION DISH_337-TA-1265-GS_00000804
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EX2067

First MOVE/Apple NDA

EX2065

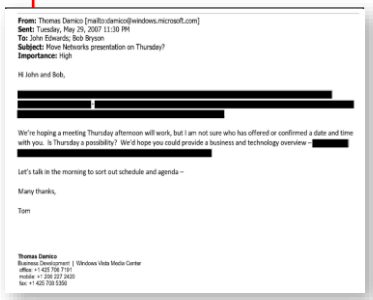
Second MOVE/Apple NDA

EX2066

2005	2006	2007	2008	2009

a service of BYU BROADCASTING
BYU Television

First Public Use of MOVE's Product
EX2020 ¶ 23



From: Thomas Damico [mailto:damico@windows.microsoft.com]
Sent: Tuesday, May 29, 2007 11:30 PM
To: John Edwards; Bob Bryson
Subject: Move Networks presentation on Thursday?
Importance: High

Hi John and Bob,

[redacted]

We're hoping a meeting Thursday afternoon will work, but I am not sure who has offered or confirmed a date and time with you. Is Thursday a possibility? We'd hope you could provide a business and technology overview – [redacted]

Let's talk in the morning to sort out schedule and agenda –

Many thanks,

Tom

Thomas Damico
Business Development | Windows Vista Media Center
office: +1 425 706 7101
mobile: +1 206 227 2620
fax: +1 425 708 3396

MOVE confidentially demonstrates technology to Microsoft
EX2042

MOVE technology used for Democratic National Convention

EX2091



The Lowdown on Apple's HTTP Adaptive Bitrate Streaming

Page 1 of 4
DISH TECHNOLOGIES L.L.C., Exhibit 2036, p. 1
Aylo Freesites Ltd. v. Dish Technologies L.L.C., IPR2024-00045

Apple Announces HTTP Live Streaming
EX2046

Summary of Objective Indicia of Non-Obviousness

1) A Presumption of Nexus Is Warranted

   a) There Are No Critical Unclaimed Features

2) The Objective Indicia Are Tied to The Claimed Combination of Features

3) British Telecom's FastNets Product Confirms the Validity of the Challenged Patents

BT's Decision to Not Commercialize Leaning Confirms Its Impracticability

POR, at 70-71;
PO Sur-Reply, at 28-30

"If something is both obvious and lucrative, one wouldn't expect it to remain on the shelf for long: surely someone would be motivated to seize on an obvious, and obviously profitable opportunity."

Durie & Lemley, A Realistic Approach to the Obviousness of Inventions, 50 WM. & MARY L. R. 997-98 (2008).

"The length of the intervening time between the publication dates of the prior art and the claimed invention can qualify as an objective indicator of obviousness."

Ex Parte Whirlpool Corp., 2013 WL 5866602, at *8 (P.T.A.B. Oct. 30, 2013) (Informative) (internal quotations omitted).

"Substantial evidence also supports the Board's finding that [Petitioner] had both successful and unsuccessful attempts to design [the claimed invention], but that none of these successful designs were manufactured or sold to consumers. In light of [Petitioner's] failure to manufacture [the claimed invention] that could be sold to consumers, this factor weights in favor of a finding of non-obviousness"

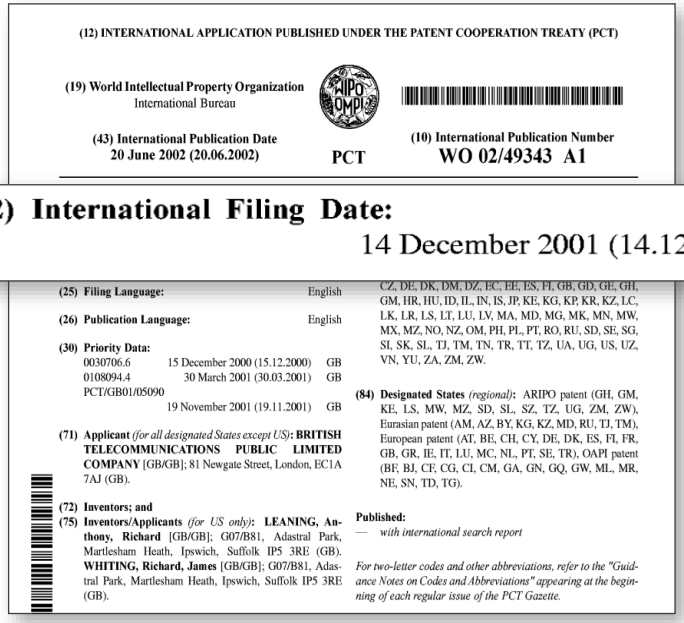
PPC Broadband, Inc. v. Corning Optical Commc'ns RF, LLC, 815 F.3d 723, 746 (Fed. Cir. 2016).

BT's Commercialization of FastNets Proves Leaning Was Unworkable

PO Sur-Reply, at 29

"A reference 'teaches away' **when … the line of development flowing from the reference's disclosure is unlikely to be productive of the result sought** by the applicant."

Santarus, Inc. v. Par Pharm., Inc., 694 F.3d 1344, 1354 (Fed. Cir. 2012)



(12) INTERNATIONAL APPLICATION PUBLISHED UNDER THE PATENT COOPERATION TREATY (PCT)

(19) World Intellectual Property Organization
International Bureau

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(71) Applicant *(for all designated States except US)*: BRITISH TELECOMMUNICATIONS PUBLIC LIMITED COMPANY [GB/GB]; 81 Newgate Street, London, EC1A 7AJ (GB).

(72) Inventors; and
(75) Inventors/Applicants *(for US only)*: LEANING, Anthony, Richard [GB/GB]; G07/B81, Adastral Park, Martlesham Heath, Ipswich, Suffolk IP5 3RE (GB). WHITING, Richard, James [GB/GB]; G07/B81, Adastral Park, Martlesham Heath, Ipswich, Suffolk IP5 3RE (GB).

(84) Designated States *(regional)*: ARIPO patent (GH, GM, KE, LS, MW, MZ, SD, SL, SZ, TZ, UG, ZM, ZW), Eurasian patent (AM, AZ, BY, KG, KZ, MD, RU, TJ, TM), European patent (AT, BE, CH, CY, DE, DK, ES, FI, FR, GB, GR, IE, IT, LU, MC, NL, PT, SE, TR), OAPI patent (BF, BJ, CF, CG, CI, CM, GA, GN, GQ, GW, ML, MR, NE, SN, TD, TG).

Published:
— *with international search report*

For two-letter codes and other abbreviations, refer to the "Guidance Notes on Codes and Abbreviations" appearing at the beginning of each regular issue of the PCT Gazette.

EX1004 (Leaning)



Innovative Research BT Research & Venturing

BT

IPR Overview: Issue 1.7 (23rd February 2007)

Instant video streaming

Video without the waiting

Streamed video is becoming more and more important for Internet services – now especially for mobile access and for IPTV. But video access over the Internet involves lengthy start-up delays of up to 30 seconds. Congestion often causes the picture to freeze, followed by another start-up delay (especially frequent with mobile access).

BT's patented 'Fastnets' technology avoids both the delays and the affects of congestion and, coupled with H.264 video technology, provides perhaps the fastest, highest quality streaming capability available.

EX1036 (BT Article)

BT Chose FastNets Years Later Over Leaning

BT's Chief IP Lawyer Confirmed Leaning Was Never Commercialized

PO Sur-Reply, at 28-29



EX1036 (BT Article)

"I entered into a correspondence with Baker Botts to understand more what it was they were looking for, what type of help. And it quickly became apparent that the Voyager 2000 system, as they referred to it … was not something they were interested in; they were more interested in a Leaning patent and whether we had commercialized the Leaning patent."

"And in the course of those communications, when I spoke to [the inventors'] line manager, Mike Whybray, Mike Whybray identified … that an audio product was trialed when the Leaning patent was first invented, if you will, around that time…[H]e followed up by saying but no video product was commercialized."

EX1035 (Ratcliffe Dep. Tr.), 19:5-14, 19:20-20:6.

Mr. Ratcliffe Researched The Leaning Reference, Not "Voyager 2000"

If FastNets is Leaning, then the Challenged Patents are Non-Obvious

PO Sur-Reply, at 28-29

The Challenged Claims Require "automatically requesting *by the media player*"

Cf. '772 Patent, cl. 1

4.3.6 Play stream switching decisions

The server initially streams the play stream with the lowest bit rate, to allow the client to decode and present media to the user immediately while also building up the level of the decoding buffer to provide resilience to network impairments. If the network has sufficient capacity to support transmission of a higher rate, the server switches at an appropriate moment to streaming a higher rate play stream.

EX1041 (Mobile Video Streaming), at 9.

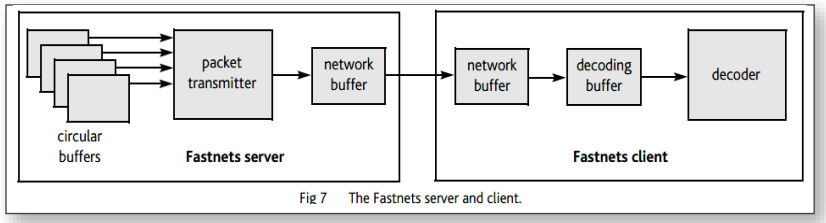


Fig 7 The Fastnets server and client.

EX1041 (Mobile Video Streaming), at 8.

The same feature is used to achieve a near-instant start. The server streams initially at 8Kbps (in this example), which can be displayed immediately with little or no buffering (it's not needed at this low rate). This gives surplus capacity that can be used to build up a buffer in the background, and after a few seconds, the server can switch up to the 30Kbps stream. In practice, the users rarely notice the initial reduced quality unless they are looking for it; it takes a few seconds to assess quality, by which time the quality has built up.

EX1036 (BT Article), at 2.

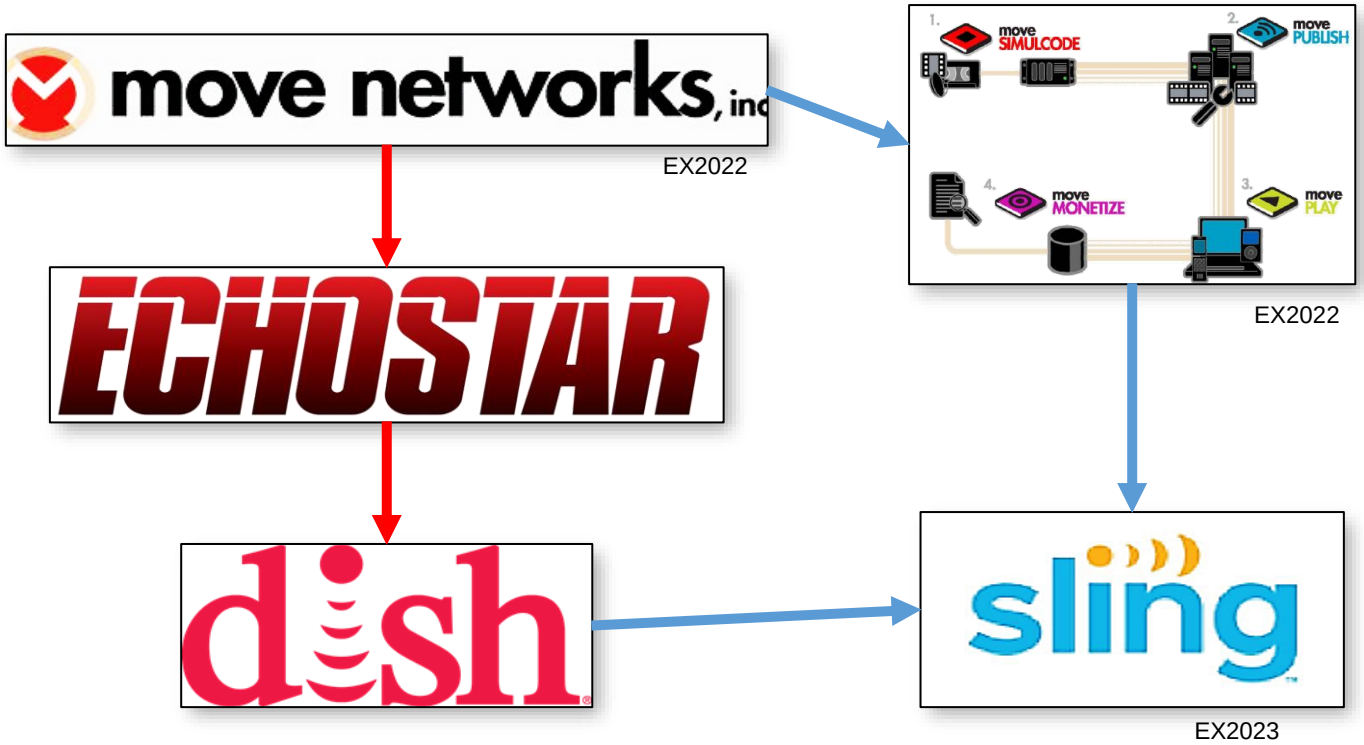
FastNets Uses Intelligent *Servers*, Not An Intelligent Client

Sling TV Evolved Out of MOVE's Technology

POR, at 62;
PO Sur-Reply, at 21

Sling TV and MOVE's Player used "the exact same technology and deployed infrastructure."

EX1030 (Ericson Dep.), 238:25-239:8



VII. Motion to Strike

Summary of Arguments

- The Petition did not propose a construction of "continuous playback" and relied on an unmodified embodiment of Leaning as allegedly disclosing that limitation.
- Petitioner's Reply proposes entirely new claim construction obviousness arguments with no foundation in the Petition. Those arguments and supporting evidence should be struck.
  - New Claim Construction – Petitioner's new "non-limiting" construction of "continuous playback" is contrary to the interpretation applied by the ITC and relied on by the Applicant during prosecution—each of which were expressly acknowledged in the Petition
  - New Obviousness Theories – Petitioner's Reply includes new theories on this limitation, sounding exclusively in obviousness, which have no basis in the unmodified embodiment of Leaning relied on in the Petition.

Untimely Nature of Petitioner's Arguments is Fatal

"Unlike 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).

A Patent Owner in an IPR 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." *In re NuVasive, Inc.*, 841 F.3d 966, 971 (Fed. Cir. 2016).

MTS at 2

Petitioner's Belated Claim Construction Should Be Struck

Petitioner's arguments that "continuous playback" is "aspirational, ***not limiting***, language" is contradictory and legally erroneous. MTS at 2-3. At a minimum, Petitioner was obligated to make that argument in its Petition ***not*** in Reply.

The Petition contended that no constructions were necessary and Petitioner's expert applied the ordinary and customary meaning of the claim terms.

> Petitioners submit that, for purposes of institution, no constructions are necessary. However, Petitioners acknowledge that in the ITC Investigation between

Pet. at 14

> 53. For purposes of this declaration, I have applied the ordinary and customary meaning of the claims when read in light of the '772 Patent and the prosecution history of the '772 Patent, as understood by a POSITA at the time of the invention.

EX1003 (Houh Dec.) at ¶ 53

It is well-settled that judges "must give meaning to all the words in [a patent's] claims." *Exxon Chemical Patents, Inv. v. Lubrizol Corp.*, 64 F.3d 1553, 1557 (Fed. Cir. 1995). A construction that reads limitations out of a claim "would be contrary to the principle that claim language should not [be] treated as meaningless." *Bicon, Inc. v. Straumann Co.*, 441 F.3d 945, 951 (Fed. Cir. 2006).

Petitioner's Belated Claim Construction Should Be Struck

Petitioner's change of position in Reply is untimely as the Petition itself acknowledged the prosecution history and the ITC construed certain terms that are present in the Challenged Claims. MTS at 3-5.

Petition acknowledged ITC constructions

> Petitioners submit that, for purposes of institution, no constructions are necessary. However, Petitioners acknowledge that in the ITC Investigation between Patent Owner and iFIT Inc. asserting family members of the '772 Patent, the Chief Administrative Law Judge ("ALJ") construed "a factor indicative of the current ability to sustain the streaming [of the video … wherein the set of one or more factors relate to the performance of the network]" according to its plain and ordinary meaning, "*e.g.*, one or more factors relating to the performance of the network that is indicative of an ability to sustain the streaming of the video." EX1009, 53-61. The ALJ also construed "repeatedly generating a factor" as "generating a factor more than once" and construed "successive determinations" according to its plain and ordinary meaning. *Id.*, 61-64.

Pet. at 14

Petition expressly discussed Applicant arguments regarding "continuous playback" in the prosecution history

> On September 11, 2008, Applicant conducted an interview and revised the claims, arguing Radford no longer anticipates or renders obvious the claims as amended because Radford does not disclose automatically and progressively requesting video portions, achieving continuous playback, or multiple TCP connections. *Id.*, 110-122.

Pet. at 8-9

Petitioner knew that "continuous playback" was highly relevant. MTS at 3-5.

Petitioner's Belated Claim Construction Should Be Struck

PO's reading of "continuous playback" is not new or unexpected; PO reads "continuous" as anyone would, *i.e*. as excluding disruptions, interruptions, and delays. MTS at 4-5.

The ITC provided a clear interpretation of the plain and ordinary meaning of "continuous playback"

a) **"sustain the streaming of the video"**

Respondents contend a person of ordinary skill in the art would not have understood the scope of the phrase "sustain the streaming of the video." Resps. Br. at 36.[11] But respondents' own

[11] Respondents concede "at least in concept, a person of skill may have understood what it means to 'achieve continuous playback' (uninterrupted viewing of the content)." Resps. Br. at 37-38.

EX1009 at 56 (highlighting added).

Any deviation from the plain and ordinary meaning of a term could and should have been addressed in the Petition. Petitioner's new claim construction arguments should be struck.

Petitioner's Untimely Modification to Leaning's "Clear Buffer" Command Should Be Struck

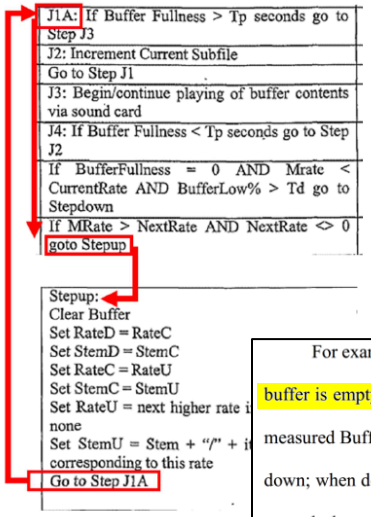
The Petition and Petitioner's initial expert declaration rely on Leaning's pseudo-code "Stepup" and "Stepdown" procedures ***without any proposed modification***.

j. 1[E]

Leaning teaches 1[E]. As explained above, Leaning discloses making the successive determinations to shift the playback quality based on the factor to achieve continuous playback of the video using the files (subfiles) of the highest quality copy of the video that is determined to be sustainable at that time. *See* 1[C]-1[D]. Leaning teaches choosing the highest quality copy that is sustainable (*i.e.*, 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). EX1004, 8:24-26 ("if the measured rate exceeds not only the current rate **but also the next higher rate** for a given period of time . . . **increase the current rate**."), 9:3-7, 9-11 (flowchart showing successive determinations to shift up to highest rate deemed sustainable). For example, the excerpted and annotated portion of Leaning's process flow chart 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 <> 0 [there exists a next higher rate] then goto 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. Thus, Leaning discloses looping "Stepup" until the highest sustainable rate is

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achieved up to the highest available rate (by setting RateU to zero). EX1004, 9-11; EX1003, ¶ 92.



EX1004, 10 (flowchart excerpted and annotated); E

For example, when determining to shift down, the Player determines (1) if the buffer is empty, (2) if the measured rate is less than the current rate, and (3) if the measured Buffer Low Percentage more than a Step Down Threshold before shifting down; when determining to shift up, the Player determines (1) if the measured rate exceeds the current rate, and (2) if the measured rate exceeds the next higher rate for a given period of time before shifting up. EX1004, 8:17-26. Once the successive

Pet. at 36

Pet. at 39-40

The Petition pointed to code, without modification, that requires discontinuities in playback.

Pet at 39-40; *see also* EX1003, ¶92 (same)

Petitioner's Untimely Modification to Leaning's "Clear Buffer" Command Should Be Struck.

Petitioner tacitly admits the Petition failed to address "continuous playback" recited in limitation 1[E]. In Reply, Petitioner pointed to citations from the Petition for entirely different limitations. MTS 5-6.

> The Petition explained Leaning teaches "shift[ing] the playback quality … to achieve continuous playback." Pet.39 (citing 1[C]-1[D]). It relied on Leaning's teachings regarding avoiding playback interruption by avoiding underflow, i.e., achieving continuous playback, with a particular modification to its system. *See id.* 38 ("Leaning also explains 'that ***interruption***' of the video stream '***can be avoided***'

Reply at 3 (highlighting added).

Petitioner's expert similarly admits that he did not "piece together" his analysis until after the opening declaration.

> other embodiments. It's just what I relied on are the embodiments I relied on that I think are proper and do disclose and render obvious the -- the challenged claims for the reasons I've given in my declarations -- well, my opening declaration, which I further kind of piece together the analysis, in some cases pointing back to my original declaration, in my supplemental declaration in response to Dr. Jeffay's arguments.

EX2150 at 57:16-25 (highlighting added).

Petitioner's Untimely Modification to Leaning's "Clear Buffer" Command Should Be Struck.

Petitioner then pivots from its express reliance on Leaning's flowchart of pseudo-code to arguing that the "Clear Buffer" command is "not necessary or desirable during a rate shift." MTS 5-7.

Petitioner points for the first time in Reply to a different section of Leaning

> Leaning describes the identified modification as "run[ning]" the sound card "***continuously*** at the highest sampling rate envisaged" to avoid "interruption[s]" in audio due to "re-setting" the sound card. Leaning 14:25-15:8; Houh2 ¶¶61-66.

Reply at 4 (highlighting added).

Petitioner's expert uses that new section to develop an entirely new modified version of Leaning

> "Shifting arguments in this fashion is foreclosed by statute, [Federal Circuit] precedent, and Board guidelines." *Wasica Fin. GmbH v. Cont'l Auto. Sys., Inc.*, 853 F.3d 1272, 1286–87 (Fed. Cir. 2017).

MTS at 7.

Petitioner's Untimely Modification to Leaning's "Clear Buffer" Command Should Be Struck.

Petitioner's belated modification to Leaning is derived solely from Dr. Houh's post-Petition *ipse dixit* pronouncements. MTS 6-7.

Q. All right. Can you point to me in the Leaning reference where it says in a specific case not to clear the buffer in a step down condition?

(Pause.)

A. So I think there are general discussions. If you look at page 14 starting around line 25, it discusses a reason that -- about the conventional sound cards at the time. It says "Changes of sampling rate (and indeed switching between mono and stereo operation) have some practical implications of audio interface 36. Many operation sound card although capable of operation at a range of different settings require resetting in order to change sampling rate and necessarily this causes an interruption in audio output. Thus in a further modification we are propose that sound card could be run continuously at the highest sampling rate envisioned. When a player program is supplied to buffer at a lower sampling rate, this data is then up-sampled to this highest rate before or after the buffer.

Petitioner's new arguments and opinions should therefore be struck.

EX2129 at 95:19-96:20 (highlighting added).

Petitioner's Untimely Changing Playout Time + "Playing Contents" Theory Should Be Struck

One of Petitioner's new theories requires (1) the extrapolation of a new playout time (T_P), in combination with (2) a nonsensical interpretation of Leaning in which "Clear Buffer" is read to mean waiting for the buffer to clear on its own, rather than actively clearing the buffer, as expressly disclosed in Leaning. MTS at 6-7.

d) Jump: implemented by the user indicating which part of the recording he wishes to jump to - for example by moving a cursor to a desired point on a displayed bar representing the total duration of the recording; the player then determines that this point is x % along the bar and calculates the number of the next sub-file needed, which is then used for the next request. In the Bach example with 125 sub-files then a request to play from a point 20% into the recording would result in a request for the 26th sub-file - i.e. 000025.bin. It will be apparent that this calculation is considerably simplified if each sub-file corresponds to the same fixed duration. We prefer, in the case of the jump, to suspend decoding and clear the buffer so that the new request is sent immediately, but this is not actually essential.

EX1004, 11:19-20

Both are entirely new and inconsistent with Petitioner's prior positions and therefore should be struck.

Petitioner's Untimely Changing Playout Time + "Playing Contents" Theory Should Be Struck

To avoid temporal discontinuities, Petitioner proposes a new, 3-second T_P that appears nowhere in Leaning or the Petition. MTS at 7-8.

PO asserts that Leaning introduces temporal discontinuities because "playout time" T_P is allegedly "set at 10 seconds" and Leaning "waits until the buffer is refilled" to begin playing. POR17, 26-27. Again, PO ignores Leaning's teachings. Leaning discloses T_P of less than a single sub-file size, such that—even with an empty buffer—playback can begin ***as soon as one sub-file is received and decoded***. Leaning 12:33-34 (sub-file size can be 130% of T_P); Houh2 ¶¶46-49, 72-75. For instance, with a four-second long sub-file, T_P would be set to three seconds, and a single sub-file would meet the playout time requirement, avoiding any buffering delay. Far from the "progressive download approach disparaged" by the patent (POR26), Leaning teaches avoiding delays in playback by using smaller sub-files. Leaning 12:27-34; Houh2 ¶¶17-28, 45-51.

Reply at 5.

As for the actual sub-file length, excessively short sub-files should preferably be avoided because (a) they create extra network traffic in the form of more requests, and (b) on certain types of packet networks - including IP networks – they are wasteful in that they have to be conveyed by smaller packets so that overhead represented by the requesting process and the packet header is proportionately greater. On the other hand, excessively large sub-files are disadvantageous in requiring a larger buffer and in causing extra delay when starting play and/or when jumps or rate changes are invoked. A sub-file size of between 30% and 130% of the playout time, or preferably around half the playout time (as in the examples given above), is found to be satisfactory.

EX1004 at 12:27-34.

Leaning's specified 4-second sub-file is ***more than*** 130% of a 3-second T_P:

$$(i.e., \frac{4\ sec.}{3\ sec.} \text{ x } 100 \text{ yields } 133.33\%).$$

These new and contradictory arguments should be struck.

Petitioner's Untimely Changing Playout Time + "Playing Contents" Theory Should Be Struck

The Petition relies heavily on the "Stepup" function in Leaning's flowchart, but does not address the "Clear Buffer" command or how it might be modified. MTS at 8-9. Yet in Reply, Petitioner argues that the "Clear Buffer" command results in the contents being ***read*** rather than ***cleared***.

This new argument contradicts Petitioner's own prior expert testimony.

> A. I think generally if you reset a card like that it is kind of teaching that that is kind of what happens. Is that you have to reset the parameters, but the reason to clear the buffer is that if the data in the buffer were at the wrong -- a different sampling rate like say -- and the sampling rate was changed that, you know, you would either get an octave lower or octave higher if you reproduce it at a range -- the rate changed by a factor of two.

EX2129 at 98:3-14

These new and contradictory arguments should be struck.

Petitioner's Untimely Arguments Using Previously-Undisclosed Encoding Techniques Should Be Struck

Leaning describes "further implications" when modifying its audio rate-shifting process for video. EX1004 at 16:17-20:

> The delivery of video recordings does however have further implications for file partitioning if switching or jumps are to be permitted. In the case of recordings where each frame of a picture is coded independently, it is sufficient that a sub-file contains a whole number of frames of a picture. If compression involving inter-frame techniques is in use, however, the

Petitioner first attempts to address these in Reply with three new modifications:

1. Encode Leaning's sub-files using Motion JPEG2000
2. Further modify Leaning's sub-files by encoding the first frame with an "I-Frame" or use some other unspecified "principle"
3. Reverse Leaning's process for "encoding … then partition[ing]" sub-files

None of these significant and complicated modifications are supported by the Petition.

These new and untimely arguments should be struck.