fuboTV Media Inc. and Yanka Industries, Inc., (Petitioners) v. DISH Technologies LLC (Patent Owner)

IPR2024-00917 (US Patent 10,757,156)

IPR2024-00918 (US Patent 9,407,564)*

IPR2024-00919 (US Patent 8,868,772)*

Petitioners' Demonstratives

* 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 IPR2024-00918 and -00919, respectively.

August 22, 2025

fuboTV Media Inc.
Exhibit 1066
fuboTV v. Dish
IPR2024-00917, -00918, -00919

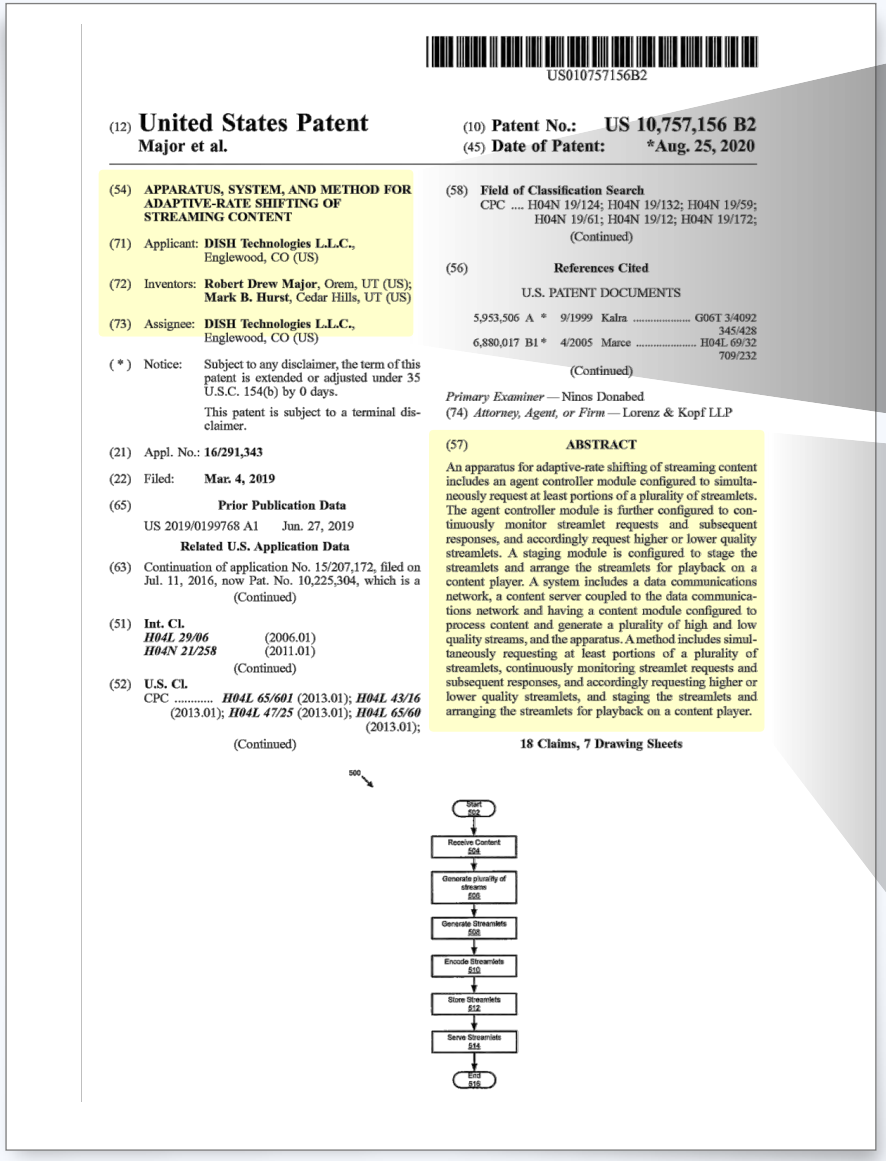
Agenda

1. The Challenged Patents (’156, ’564, and ’772 Patents)
2. Claim Construction
3. Leaning, Alone Or In Combination, Renders Challenged Claims Obvious
4. Secondary Considerations Do Not Overcome Obviousness Case

Agenda

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Challenged Patents



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**

(71) Applicant: **DISH Technologies L.L.C.**, Englewood, CO (US)

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

(73) Assignee: **DISH 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 0 days.

This patent is subject to a terminal disclaimer.

(21) Appl. No.: **16/291,343**

(22) Filed: **Mar. 4, 2019**

(65) **Prior Publication Data**

US 2019/0199768 A1 Jun. 27, 2019

Related U.S. Application Data

(63) Continuation of application No. 15/207,172, filed on Jul. 11, 2016, now Pat. No. 10,225,304, which is a (Continued)

(51) **Int. Cl.**
H04L 29/06 (2006.01)
H04N 21/258 (2011.01)
(Continued)

(52) **U.S. Cl.**
CPC ***H04L 65/601*** (2013.01); ***H04L 43/16*** (2013.01); ***H04L 47/25*** (2013.01); ***H04L 65/60*** (2013.01);
(Continued)

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

(56) **References Cited**

U.S. PATENT DOCUMENTS

5,953,506 A * 9/1999 Kalra G06T 3/4092 345/428
6,880,017 B1 * 4/2005 Marce H04L 69/32 709/232
(Continued)

Primary Examiner — Ninos Donabed
(74) *Attorney, Agent, or Firm* — Lorenz & Kopf LLP

(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. The agent controller module is further configured to continuously monitor streamlet requests and subsequent responses, and accordingly request higher or lower quality streamlets. A staging module is configured to stage the streamlets and arrange the streamlets for playback on a content player. A system includes a data communications network, a content server coupled to the data communications network and having a content module configured to process content and generate a plurality of high and low quality streams, and the apparatus. A method includes simultaneously requesting at least portions of a plurality of streamlets, continuously monitoring streamlet requests and subsequent responses, and accordingly requesting higher or lower quality streamlets, and staging the streamlets and arranging the streamlets for playback on a content player.

18 Claims, 7 Drawing Sheets

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

(71) Applicant: **DISH Technologies L.L.C.**, Englewood, CO (US)

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(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. The agent controller module is further configured to continuously monitor streamlet requests and subsequent responses, and accordingly request higher or lower quality streamlets. A staging module is configured to stage the streamlets and arrange the streamlets for playback on a content player. A system includes a data communications network, a content server coupled to the data communications network and having a content module configured to process content and generate a plurality of high and low quality streams, and the apparatus. A method includes simultaneously requesting at least portions of a plurality of streamlets, continuously monitoring streamlet requests and subsequent responses, and accordingly requesting higher or lower quality streamlets, and staging the streamlets and arranging the streamlets for playback on a content player.

Challenged Patents Relate To Adaptive-Rate Shifting Of Streaming Content

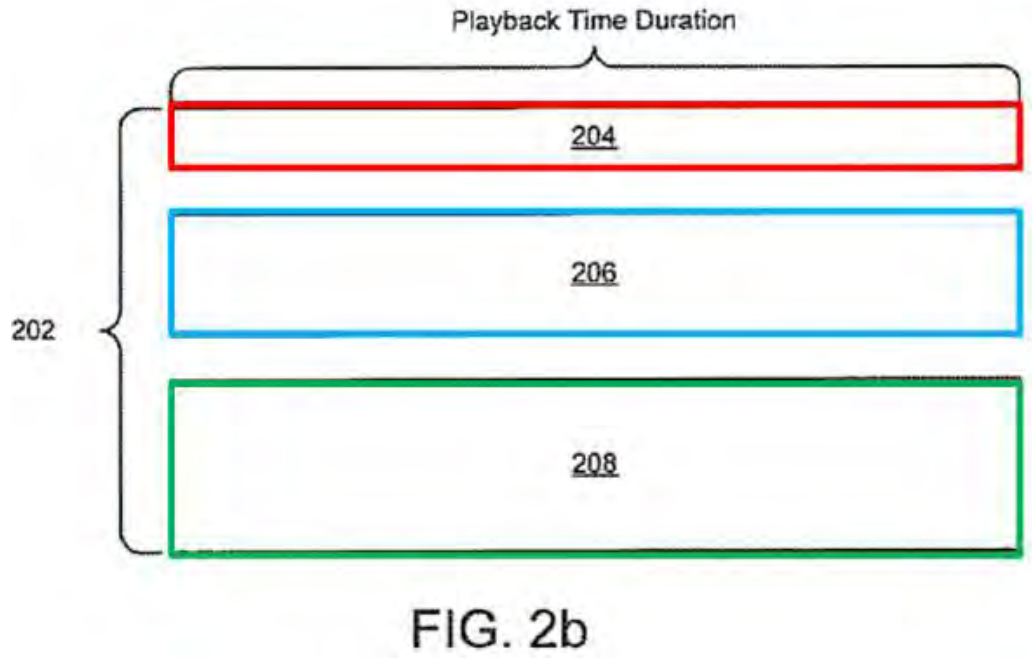


FIG. 2b

IPR2024-00917 Ex. 1001, '156 Patent Fig. 2b

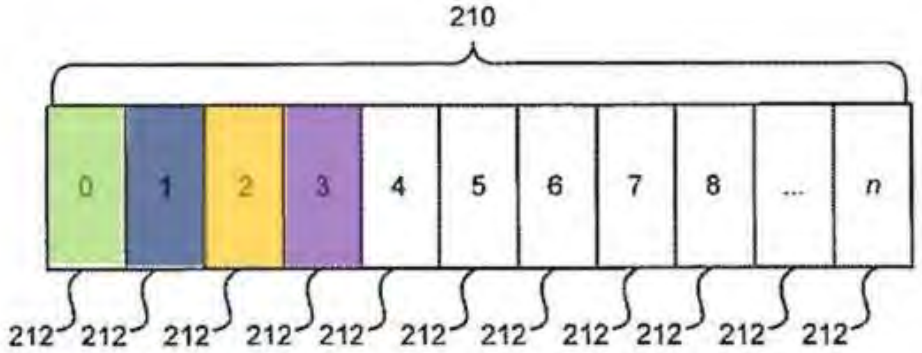


FIG. 2c

IPR2024-00917 Ex. 1001, '156 Patent Fig. 2c

IPR2024-00917, -00918, -00919 Pet. 7-8

Agenda

1. The Challenged Patents ('156, '564, and '772 Patents)
2. **Claim Construction**
3. Leaning, Alone Or In Combination, Renders Challenged Claims Obvious
4. Secondary Considerations Do Not Overcome Obviousness Case

Challenged Claims Do Not Require Playback Completely Uninterrupted In Time and Content

1. An apparatus for rendering a video that is adaptively received as a digital stream from a video server over a network, the apparatus comprising;

a media player operating on the apparatus, wherein the media player is configured to stream the video from the

* * *

video, and wherein the media player streams the video by:

* * *

adapting the successive determinations to shift the play-back 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; and

presenting the video for playback by providing the requested streamlets in order of ascending start time.

IPR2024-00917 Ex. 1001, '156 Patent Claim 1

"shift the playback quality based on the factor to achieve continuous playback of the video" is aspirational, not limiting

PO Agrees Challenged Claims Do Not Require Playback Completely Uninterrupted In Time and Content

Patent Owner Sur-Reply

experienced stalls, this is irrelevant even if it were true. The claims do not require eliminating ***all*** interruptions under ***every*** conceivable scenario. Rather, they require a method of playback that automatically adjusts in response to network performance to ***avoid*** playback interruption. If that sometimes succeeds, the apparatus that

IPR2024-00917 POSR 7-8; *see also* IPR2024-00918 POSR 7; IPR2024-00919 POSR 7

IPR2024-00917 POSR 7

File History Explains Shifting Quality "To Achieve Continuous Playback"

'772 Patent File History

Applicant also respectfully submits that the media player can achieve continuous playback of the requested video without the problem described in the background of *Hughes* and of *Li* because the shifts between the playback quality occur during playback at portion boundaries. The "requests" are for "portions," so the "shifts" occur at the "portion" level; and the "portions" of the different "copies" are the "same portion of the video;" so shifts happen on portion boundaries and the portion boundaries of the copies at the same time index in the video – meaning playback is continuous.

IPR2024-00917, -00918 Ex. 1018 at 486; IPR2024-00919 Ex. 1002 at 486

File History Does Not Suggest "Shifting … To Achieve Continuous Playback" Requires Uninterrupted Playback

'772 Patent File History

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.

IPR2024-00917, -00918 Ex. 1018 at 118; IPR2024-00919 Ex. 1002 at 118

Applicant Rewrote The Claims In Response to Radford Rejection

’772 Patent File History

20. (Currently amended) A method for presenting rate-adaptive streams, the method comprising:

streaming by a media player operating on an end user station a video from a server, wherein the video has a playback duration, wherein different copies of the video are stored on the server, wherein each of the different copies is encoded and compressed according to a different bit rate and includes the entire playback duration of the video, wherein the different copies are divided into portions whose playback is the same portion of the video for each of the different copies, wherein corresponding portions of the different copies have the same time index in relation to the beginning of the video, and wherein the streaming comprises:

~~simultaneously~~ requesting ~~at least portions of~~ a plurality of ~~streamlets~~ sequential portions of a first of the copies encoded and compressed at a first of the bit rates from the server over a plurality of Transmission Control Protocol (TCP) connections;

~~continuously monitoring the progress of subsequent responses to streamlet requests, and in accordance with the progress of the responses,~~ automatically and progressively requesting over the plurality of TCP connections subsequent portions of the video by requesting from different ones of the copies dependent upon successive determinations to shift the playback quality to a higher or lower quality ~~streamlets~~one of the different copies, said automatically and progressively requesting including,

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; and

~~staging~~presenting the ~~streamlets~~video to the user by playing back with ~~and arranging the streamlets for playback on a content~~the media player the requested portions from the different copies in order of ascending playback time.

IPR2024-00917, -00918 Ex. 1018 at 110-11; IPR2024-00919 Ex. 1002 at 110-11

IPR2024-00917, -00918, -00919 Opp. to Mot. To Strike 3

PO's Cited Law Does Not Support Its Arguments

Patent Owner Sur-Reply

which was "marred by interruptions." EX1018, 118. (emphasis original).[5] These statements confirm that the amended language limits the claims. *See Personalized Media Commc'ns, LLC v. Apple Inc.*, 952 F.3d 1336, 1341 (Fed. Cir. 2020) ("If an applicant argues that a claim feature … distinguishes the invention from the prior art, the feature is more likely to be deemed limiting."). In his initial declaration for

IPR2024-00917, -00918, -00919 POSR 5-6

PO's quotation does not appear in the cited decision

"During prosecution, the applicant repeatedly and consistently voiced its position that encryption and decryption require a digital process in the context of the '091 patent. The applicant never abandoned that position. Indeed, the applicant amended the claims—giving rise to the claim term at issue on appeal—only to clarify its position that "encryption requires a digital signal."

Personalized Media Commc'ns, LLC v. Apple Inc., 952 F.3d 1336, 1345-46 (Fed. Cir. 2020).

IPR2024-00917, -00918, -00919 Reply 5-6

PO Mischaracterizes Dr. Houh's Testimony

Patent Owner Sur-Reply

and before the ITC. Reply, 1. Although Petitioners attempt to rely on their expert, Dr. Houh, to justify this new construction, Dr. Houh previously testified before this Board that a POSITA would understand "continuous" to mean "substantially uninterrupted" (EX2150 ("Houh2 Tr."), 149:23-150:12). This directly contradicts

IPR2024-00917, -00918, -00919 POSR 2

Dr. Houh's Testimony



Dr. Henry Houh

Q The last sentence in that paragraph. Which begins on page 83 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.

I mean, again, this is a different case, a different set of facts, different specifications in the patent, different context, different file histories than the current case we're looking at with respect to the '772.

Q Okay.

IPR2024-00917, -00918, -00919 Ex. 2150 Houh2 Tr. 149:23-150:25

IPR2024-00917, -00918, -00919 POSR 2

PO Incorrectly Asserts The ITC Construed Claims To Require Uninterrupted Viewing of Content

Patent Owner Motion to Strike

In that ruling, the ITC's Chief Administrative Law Judge ("ALJ") provided a clear interpretation of the plain and ordinary meaning of "continuous playback" and how it was "concede[d], at least in concept, [that] a person of skill may have understood what it means to 'achieve continuous playback' (***uninterrupted*** viewing of the content)." EX1009, 63. The Chief ALJ also held that "continuous playback"

IPR2024-00917, -00918, -00919 MTS 4

ITC Decision

a) "sustain the streaming of the video"

[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.

Ex. 1009 56 n.11

the factor to achieve continuous playback of the video." Thus, "the current ability to sustain the streaming of the video" relates to an analysis of network conditions, while the phrase "continuous playback of the video" is the goal sought through the "determinations to shift" playback quality.

Ex. 1009 58-59

The ITC recognized that "continuous playback of the video" was aspirational: it is the goal sought through the shifts in playback quality

IPR2024-00917, -00918, -00919 Opp. to Mot. To Strike 4

Shifting Quality "To Achieve Continuous Playback" Is Aspirational, Not Limiting



We reach the same conclusion with respect to the expression "an antineoplastically effective amount," also in the '803 claims. ***That expression of intended result essentially duplicates the dosage amounts recited in the claims*** that are also described in the specification as "antineoplastically effective."

* * *

We also agree with the defendants that the amendment adding "antineoplastically effective amount" was voluntarily made after the examiner had already indicated to Bristol that the claims were allowable. *See* Supplemental Response for Application No. 08/544,594 (Jan. 10, 1997). These unsolicited assertions of patentability made during prosecution do not create a material claim limitation where we have determined that the language does not create one.

Bristol-Myers Squibb Co. v. Ben Venue Laboratories, 246 F.3d 1368, 1375 (Fed. Cir. 2001).

Petitioners' Claim Construction Argument Is Not New Or Improper

Petition proposed plain and ordinary meaning:

Petition

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

IPR2024-00917 Pet. 10; *see also* IPR2024-00918 Pet. 11; IPR2024 -00919 Pet. 14

PO proposed a narrowing construction that would require playback completely uninterrupted in time and content:

Patent Owner Response

Petitioner's own demonstrative therefore shows that Leaning's playback is ***not*** "continuous," during a rate shift, as required by element 1[D]. Instead, during

* * *

loss of audio content and introduces both temporal and content discontinuities. EX2141, ¶72.[11] Petitioner's inability to show that Leaning discloses "continuous"

IPR2024-00917 POR 22; *see also* IPR2024-00918 POR 23; IPR2024-00919 POR 27

IPR2024-00917, -00918, -00919 Opp. to Mot. To Strike 2

Petitioners Are Entitled To Respond to PO's New (And Incorrect) Construction



> We think this case falls squarely within the rule of *SAS, Ericsson, Hamilton Beach,* and *Qualcomm:* that, under the APA, when the Board adopts a new claim construction following institution, an IPR petitioner must have adequate notice and an opportunity to respond under the new construction. In particular, ***the petitioner must be afforded a reasonable opportunity in reply to present argument and evidence under that new construction***. Here, Axonics was not afforded that opportunity. Although the Board considered Axonics' arguments against the new claim construction, it refused to consider Axonics' evidence and argument under that construction.
>
> *Axonics, Inc. v. Medtronic, Inc.*, 75 F.4th 1374, 1383 (Fed. Cir. 2023).

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3. **Leaning, Alone Or In Combination, Renders Challenged Claims Obvious**
4. Secondary Considerations Do Not Overcome Obviousness Case

3 Leaning Alone, Or In Combination, Renders Challenged Claims Obvious

Leaning Alone Renders Obvious:

- **Continuous playback (all challenged claims)**
- Requesting streamlets/files via multiple/a plurality of TCP connections ('156 patent, cl. 2; '564 patent, cls. 2, 9, 11; '772 patent, all challenged claims)
- Requesting low quality files/streamlets ('156 patent, cl. 10; '564 patent cl. 7; '772 patent, cl. 6)
- Independently playable streamlets ('156 patent, cls. 5 and 15)
- Upshifting according to amount of contiguously available files ('564 patent, cl. 5)
- Anticipating file requests and pre-requesting files ('564 patent, cl. 6)
- Arranging files ('772 patent, cl. 8)

Leaning Alone Or With Ala-Honkola Renders Obvious:

"Requesting Sequential Streamlets" Over Multiple TCP Connections ('156 patent, cl. 2)

Leaning Alone Or With Gamble Renders Obvious:

Requesting Sub-Parts of Files Over A Plurality of TCP Connections ('564 patent, cls. 9, 11; '772 patent, cls. 2, 9)

Leaning Teaches Continuous Playback

1. **Leaning teaches—and the Petition relied upon—an embodiment that avoids interruption**
2. Leaning teaches that the minimum playout time for playback to begin can be smaller than the size of one sub-file, avoiding discontinuity
3. Clearing the buffer can include doing so by playing out the contents of the buffer until it has emptied, avoiding discontinuity
4. Leaning teaches encoding and segmenting video without introducing any interruption

Leaning Teaches Avoiding Interruptions Playback

Leaning

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

Ex. 1004 Leaning 14:25-34

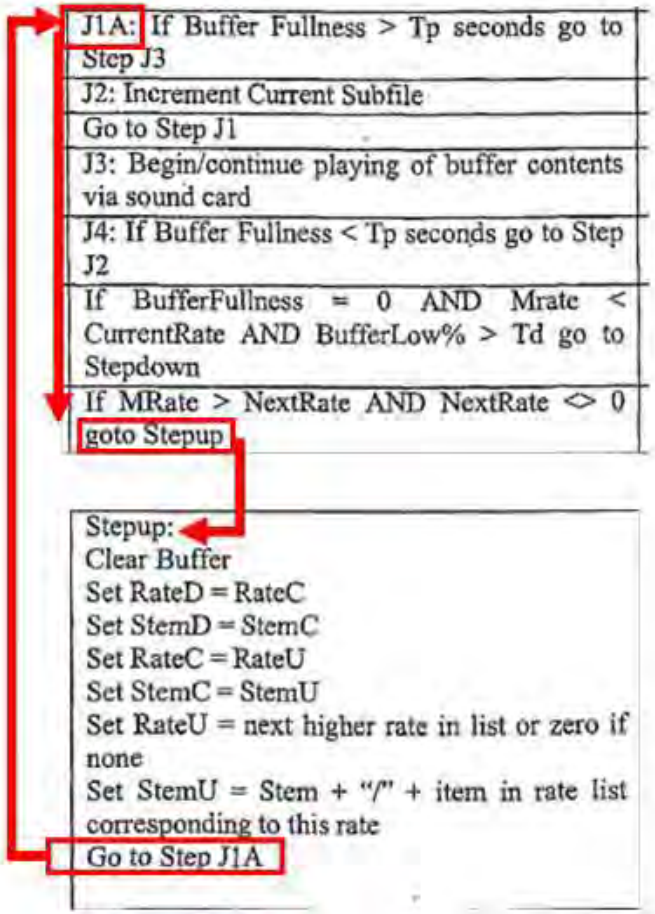
Recollecting that the criteria discussed earlier for automatic data rate switching downwards envisaged a rate reduction only in cases of buffer underflow (involving therefore interruptions in the output), we note that with this modification such interruption can be avoided and therefore it is preferable 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.

Ex. 1004 Leaning 15:3-8

IPR2024-00917 Pet. 36-37, Reply 3; IPR2024-00918 Pet. 35-36, Reply 3; IPR2024-00919 Pet. 38-39, Reply 3

The Cited Embodiment In Leaning Avoids Clearing The Buffer

Leaning



Ex. 1004 Leaning 10 (annotated)

IPR2024-00917 Pet. 39, Reply 4; IPR2024-00918 Pet. 38, Reply 4; IPR2024-00919 Pet. 40, Reply 4

Dr. Houh's Testimony



Dr. Henry Houh

So I think what a person of ordinary skill in this would recognize part of the reason for clearing the buffer is that the card is being reset, but Leaning is teaching an alternative where if you ran the card at this highest sampling rate and in stereo, and changes in the byte rate are up-sampled, and changes between mono – stereo to mono are simply duplicating mono on both channels or changing in the sample size are padded as described in – in this section that it would not be necessary to reset the card or clear the buffer, and so this is describing a general alternative to the flow chart where a person of ordinary skill would recognize that the clear buffer in the example would not be needed.

IPR2024-00917, -00918, -00919 Ex. 2129 Houh Tr. 97:6-23

The Cited Embodiment In Leaning Avoids Clearing The Buffer

Running the sound card at the highest sampling rate avoids clearing the buffer

Dr. Houh's Testimony



Dr. Henry Houh

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 breathes helium or when…

Ex. 2129 Houh Tr. 97:24-98:24

IPR2024-00917, -00918, -00919 POSR 14-15

The Cited Embodiment In Leaning Avoids Clearing The Buffer

Dr. Houh Declaration

62. Regardless, as I explained in my original declarations, Leaning also discloses that "interruption can be avoided." Ex. 1004 at 15:3-8, 8:11-16. Specifically, Leaning first describes that existing interruptions to audio output when rates are switched resulted from "conventional sound cards" having to "re-set[] in order to change sampling rate." Ex. 1004 at 14:25-20. This need arose in the context of conventional sound cards because those early sound cards had fixed internal clocks tied to the actual circuitry of the device. Changing the rate of processing required actually reconfiguring the circuitry during the reset.

63. To avoid the need to reset, which would create an interruption, Leaning explains that the "sound card could be run continuously at the highest sampling rate envisaged." Ex. 1004 at 14:28-30. Leaning next describes that when there is "buffer underflow," i.e., interruptions in output, Leaning will rate switch downwards to avoid that interruption "in the majority of cases" by leveraging "automatic data rate switching downwards." Ex. 1004 at 15:3-8. The result is that the system disclosed in Leaning can rate shift without clearing the buffer and without interruption.

Ex. 1026 Houh Suppl. Decl. ¶¶62-63

Leaning Teaches Clearing The Buffer Is Not Always Required

Leaning Teaches Clearing The Buffer Is Not Essential For Jumps

Leaning

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.

Ex. 1004 Leaning 11:19-20

Dr. Jeffay, Patent Owner's Expert, Testimony



Dr. Jeffay

Q Leaning directly teaches that clearing the buffer on a jump command is not actually essential, correct?

A That's what Leaning says.

Ex. 1027 Jeffay Tr. 76:12-15

IPR2024-00917, -00918, -00919 Reply 4-5

The Cited Embodiment In Leaning Does Not Clear The Buffer

Leaning Does Not Teach Clearing The Buffer For A Single, Fixed Sampling Rate

Patent Owner Sur-Reply

In fact, Leaning's "clear buffer" command is indifferent to whether the sound cards need to be reset. This is borne out by the fact Leaning's "clear buffer" command is described as being performed in an embodiment that uses a single, fixed sampling rate. EX1004, 12:23-26 ("[I]n this embodiment…the available data rates…*all* use *the same audio sampling rate* …."). This contradicts Petitioners'

IPR2024-00917 POSR 13; *see also* IPR2024-00918 POSR 12; IPR2024-00919 POSR 12-13

Leaning

It is of interest to discuss further the process of partitioning the original file into sub-files.

* * *

number of frames. In the case of rate switching, it is, if not actually essential, highly desirable that the sub-file boundaries are the same for each rate, so that the first sub-file received for a new rate continues from the same point in the recording that the last sub-file at the old rate ended. To arrange that every sub-file should represent the same fixed time period (e.g. the 4 seconds mentioned above) is not the only way of achieving this, but it is certainly the most convenient. Note however that, depending on the coding system in use, the requirement that a sub-file should contain a whole number of frames may mean that the playing duration of the sub-files does vary 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.

Ex. 1004 Leaning 12:8-26

IPR2024-00917 POSR 13; *see also* IPR2024-00918 POSR 12; IPR2024-00919 POSR 13

Video Playback Did Not Require Clearing The Buffer

Dr. Houh Declaration

64. Further, when considering Leaning's applications to video files (which, as explained above, is disclosed), a person of ordinary skill in the art would have understood that changing the video bitrate does not require a hardware reset or clearing the buffer. Rather the refresh rate of a display device (like a computer monitor) is decoupled from the bitrate and framerate at which the video player is operating. Ex. 2129 at 99:12-104:22; United States Patent No. 6,304,297 (Ex. 1049) at 1:10-2:53. For example, a computer monitor's refresh rate can remain static while a video player (such as one in a web browser) changes bitrates or while different applications open with an operating system's windowing interface update their application window at different rates. The video player application does not concern itself with the refresh rate of the display device hardware. This approach, which is how video has worked since well before the challenged patents, permitted rate adjustments to an application's display window without requiring any hardware resets.

Ex. 1026 Houh Suppl. Decl. ¶64

Leaning

The same principle may be applied to the delivery of video recordings, or of course, video 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.

Ex. 1004 Leaning 16:6-10

IPR2024-00917, -00918, -00919 Reply 9-10

Video Playback Did Not Require Clearing The Buffer

Dr. Houh Declaration

66. Additionally, even if video cards needed to be reset like audio cards (which they do not), a person of ordinary skill in the art would readily implement the solution expressly taught in Leaning to run the video card (like Leaning teaches running the audio card) continuously at the highest sampling rate. Ex. 1004 at 14:25-15:8, 16:6-7.

Ex. 1026 Houh Suppl. Decl. ¶66

Leaning

The same principle may be applied to the delivery of video recordings, or of course, video recordings with an accompanying sound track. In the simpler version, where there is only one

Ex. 1004 Leaning 16:6-7

IPR2024-00917, -00918, -00919 Reply 9-10

Leaning Does Not Require Clearing The Buffer

PO Mischaracterizes Third Party Testimony

Patent Owner Response

actually disclose a glaring ***two-minute discontinuity*** at ***every upshift***. Aylo specifically states: "Since [Leaning's] upshift simply relates to the next sub-file being requested from the directory in which the higher quality copy is stored ([Leaning], page 9, top), clearing the buffer would mean that for each upshift, there is a jump in the file by at least 120 seconds or 2 minutes." EX2016 (EPO Response)

IPR2024-00917 POR 22-23

Ex. 2016

That means, when upshifting from the lowest quality to the next higher quality, the buffer will have been filled for 120 seconds with a rate higher than 16 kbit/s ("*next higher rate*") and at the same time been drained with a rate of 8 kbit/s ("*current rate*"). That means, when upshifting, the buffer will be filled by at least "120 seconds x (16 kbit/s – 8 kbit/s) = 960 kbit". 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 24-26, the skilled person gathers that the buffer shall precisely not be cleared when upshifting to avoid such jumps.

Ex. 2016 8-9

IPR2024-00917, -00918, -00919 Reply 9-10

No New Or Improper Arguments In Petitioner Reply

Reply Relies On The Same Embodiments, At Most Expanding On The Same Arguments In Response To POR

> [W]e have held that a reply may be proper if it is responsive and simply expands on previously raised arguments. For example, in *Ericsson*, we reversed the Board's decision to exclude the petitioner's reply argument in part because the petitioner had "merely expand[ed] on a previously argued rationale as to why the prior art disclosures are insubstantially distinct from the challenged claims." 901 F.3d at 1381. We cautioned the Board not to parse "arguments on reply with too fine of a filter." *Id*. at 1380; *see also Chamberlain Grp., Inc. v. One World Techs., Inc.,* 944 F.3d 919, 925 (Fed. Cir. 2019) ("Parties are not barred from elaborating on their arguments on issues previously raised."); *Belden Inc. v. Berk-Tek LLC*, 805 F.3d 1064, 1081-82 (Fed. Cir. 2015) (reasoning that rebuttal evidence should be responsive such that it is offered "to explain, repel, counteract, or disprove the evidence of the adverse party").
>
> *Rembrandt Diagnostics LP v. Alere, Inc.,* 76 F.4th 1376, 1384 (Fed. Cir. 2023).

IPR2024-00917, -00918, -00919, Reply 8

Petitioners' Contention That Leaning Discloses Continuous Playback Is Not A New Argument

The Petition Relied On The Same Embodiment ("Modification") In Leaning

Petition

Leaning teaches 1[D]. As explained above, Leaning discloses adapting the successive determinations to shift the playback quality based on generated factors to achieve continuous playback of the video using the streamlets (subfiles) of the highest quality copy of the video that is determined to be sustainable at that time. *See* 1[B][2]-1[C]. Leaning teaches choosing the highest quality copy that is

IPR2024-00917 Pet. 37;
***see also* IPR2024-00918 Pet. 36; IPR2024-00919 Pet. 39**

Petition

Leaning also explains "that interruption" of the video stream "can be avoided and therefore it is preferable to employ a criterion which anticipates underflow and avoids it in the majority of cases" by omitting the first determination (*i.e.*, whether the buffer is completely empty) and generating measured rate and Buffer Low Percentage factors as indicators of whether the current streaming rate is sustainable. EX1004, 15:3-8, 8:11-16 (repeatedly generates the factor because "process **from**

IPR2024-00917 Pet. 36-37;
***see also* IPR2024-00918 Pet. 35-36; IPR2024-00919 Pet. 38**

IPR2024-00917 Pet. 36-37; IPR2024-00918 Pet. 35-36; IPR2024-00919 Pet. 38-39

Reply Relies On The Same Embodiment In Leaning

Leaning

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.

Ex. 1004 Leaning 15:3-8

Leaning

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

Ex. 1004 Leaning 14:25-34

IPR2024-00917 Pet. 36-37, Reply 3; IPR2024-00918 Pet. 35-36, Reply 3; IPR2024-00919 Pet. 38-39, Reply 3

Petitioners Do Not Rely On "New Modifications" Of Leaning

Patent Owner Sur-Reply

Regardless, these new obviousness arguments fail to provide the missing "continuous playback" limitation and remain deficient. Petitioners never explain how a POSITA would have been motivated to make these modifications—much less with a reasonable expectation of success. That omission alone is fatal to Petitioners'

IPR2024-00917, -00918, -00919 POSR 3

Petitioner does not propose modifying Leaning. It relies on Leaning's express disclosure.

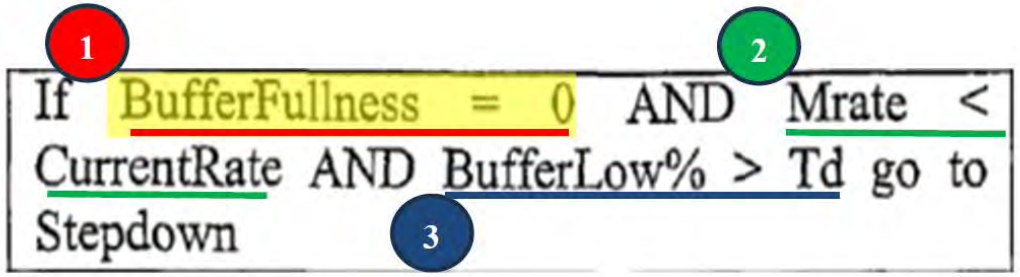
IPR2024-00917, -00918, -00919 POSR 3

PO's New POSR Argument That Leaning's Playback Is Discontinuous Fails On The Merits

Improper New POSR Argument

Patent Owner Sur-Reply

Leaning's sole disclosure of its three downshift conditions are annotated below, with the condition Petitioners seek to eliminate (number 1) shown highlighted:



EX1004, 10 (highlighting and annotations added). But as Leaning explains, the third condition—BufferLow% > Td—requires the buffer to experience "multiple empties" when Td is set to Leaning's "preferred default value," confirming that the current "rate can not be sustained." EX1004, 8:27-9:2; EX2141, ¶91 (explaining same).

IPR2024-00917 POSR 11; *see also* IPR2024-00918 POSR 10; IPR2024-00919 POSR 10-11

Leaning

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.

Ex. 1004 Leaning 8:27-9:2

IPR2024-00917, -00918, -00919 Reply 4

Leaning Teaches Continuous Playback

1. Leaning teaches—and the Petition relied upon—an embodiment that avoids interruption

2. **Leaning teaches that the minimum playout time for playback to begin can be smaller than the size of one sub-file, avoiding discontinuity**

3. Clearing the buffer can include doing so by playing out the contents of the buffer until it has emptied, avoiding discontinuity

4. Leaning teaches encoding and segmenting video without introducing any interruption

Leaning Does Not Introduce Temporal Discontinuities

Patent Owner Response

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

IPR2024-00917 POR 12

These features of Leaning ensure that, during and after any rate shift or jump, Leaning halts audio playback until the buffer fills beyond the "playout time T_P"—i.e., until there is another 10 seconds of content downloaded and stored in the buffer.

IPR2024-00917 POR 15

- Playout time of 10 seconds is an example
- Leaning teaches that a sub-file size can be larger than the playout time

Leaning

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.

Ex. 1004 Leaning 5:20-22

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.

Ex. 1004 Leaning 12:33-34

IPR2024-00917 Reply 4-5; IPR2024-00918 Reply 4-5; IPR2024-00919 Reply 4-5

Leaning Teaches Avoiding Delays

Leaning Teaches Selecting A Sub-file Size To Avoid Delays

Patent Owner Sur-Reply

This interpretation is confirmed elsewhere. Leaning warns against using overly long sub-files, noting that they introduce "extra delay" when rate switching, because the entire file must be downloaded before playback can resume. EX1004,12:31-33. This again assumes an unavoidable pause during each rate change—one that is extended, not eliminated, by longer file lengths.

IPR2024-00917 POSR 13;
***see also* IPR2024-00918 POSR 12; IPR2024-00919 POSR 13**

Leaning

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.

Ex. 1004 Leaning 12:31-34

IPR2024-00917, -00918, -00919 Reply 4-5

Leaning Does Not Introduce Temporal Discontinuities

Leaning Permits Playback Upon Receipt Of The First Sub-file

Dr. Houh Declaration

72. Additionally, as I explain above, a sub-file length of up to 130% T_p is satisfactory. Ex. 1004 at 12:31-34. For example, a sub-file could be about 4 seconds long and T_p could be 3 seconds. In other words, a single sub-file will exceed the playout time and playback will begin or resume upon that single sub-file being decoded into the buffer. Furthermore, if the sub-file length was 2 seconds

* * *

are involved." Ex. 1004 at 12:31-32. Leaning then goes on to explain that "[a] sub-file size of between 30% and 130% of the playout time" is "satisfactory," and, therefore, not excessively large. Ex. 1004 at 12:33-34. As explained above, this includes sub-file sizes that permit playback upon receipt of the first sub-file by having a size equal to or larger than the playout time (100-130%).

Ex. 1026 Houh Suppl. Decl. ¶¶72, 75

IPR2024-00917, -00918, -00919 Reply 4-5

Leaning Does Not Introduce Temporal Discontinuities

Improper New POSR Argument

PO's New Sur-Reply Argument Fails On The Merits

Patent Owner Sur-Reply

continuous. Even with a reduced T_P, Leaning still requires downloading an entire sub-file before playback can resume. That pause—while the next file is retrieved and downloaded—introduces a temporal discontinuity in playback. Reducing T_P may

IPR2024-00917 POSR 14; *see also* IPR2024-00918 POSR 13; IPR2024-00919 POSR 14

Leaning

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

Ex. 1004 Leaning 5:24-25

Petitioner Reply

First, Leaning discloses that the playout time can be less than the duration of a sub-file, and therefore playback can begin upon reception and decoding of a single sub-file. Leaning 12:34-35; Houh2 ¶¶49, 75, 135. In such case, Leaning's playback is "instant" within the constraints of computer networking. Houh2 ¶¶49, 75, 135.

IPR2024-00917 Reply 14; *see also* IPR2024-00918 Reply 13; IPR2024-00919 Reply 14

IPR2024-00917 Pet. 39; *see also* IPR2024-00918 Pet. 30; IPR2024-00919 Pet. 31

Leaning Teaches Continuous Playback

1. Leaning teaches—and the Petition relied upon—an embodiment that avoids resetting the sound card, avoiding interruption
2. Leaning teaches that the minimum playout time for playback to begin can be smaller than the size of one sub-file, avoiding discontinuity
3. **Clearing the buffer can include doing so by playing out the contents of the buffer until it has emptied, avoiding discontinuity**
4. Leaning teaches encoding and segmenting video without introducing any interruption

Leaning Does Not Introduce Content Discontinuities

In The Context Of Changing Bitrates, Clearing The Buffer Can And Should Be Implemented By Playing Out The Sub-Files In The Buffer

Patent Owner Response

not "continuous," during a rate shift, as required by element 1[D]. Instead, during ***every shift***, Leaning consistently teaches clearing the buffer then restarting the process to re-fill the buffer with T_p seconds of content. This explicitly causes the loss of audio content and introduces both temporal and content discontinuities.

IPR2024-00917 POR 22

Leaning

number of frames. In the case of rate switching, it is, if not actually essential, highly desirable that the sub-file boundaries are the same for each rate, so that the first sub-file received for a new rate continues from the same point in the recording that the last sub-file at the old rate ended. To

Ex. 1004 Leaning 12:16-18

Dr. Houh Declaration

84. Finally, to address the title Dr. Jeffay uses for this section ("A POSITA Would Not Discard Leaning's 'Clear Buffer' Instruction"), a person of ordinary skill in the art would not need to "discard" the "Clear Buffer"-related teachings, including because Leaning itself makes clear that the inclusion thereof is optional (as discussed above) and because a person of ordinary skill in the art would understand that, in the context of changing bitrates, any clearing of the buffer could (and should) be implemented by playing out the sub-files already in the buffer, including because Leaning teaches that "the first sub-file received for a new rate continues from the same point in the recording that the last sub-file at the old rate ended." Ex. 1004 at 12:16-18.

Ex. 1026 Houh Suppl. Decl. ¶84

IPR2024-00917, -00918, -00919 Reply 5-6

Leaning Does Not Introduce Content Discontinuities

In The Context Of Changing Bitrates, Clearing The Buffer Can And Should Be Implemented By Playing Out The Sub-Files In The Buffer

Patent Owner Sur-Reply

For example, Leaning discloses clearing the buffer upon a user "jump" so that new content can be requested "immediately," without waiting for residual content to empty from the buffer. EX1004, 11:19-20, 12:31-33. Leaning also explicitly distinguishes between the command to "clear buffer" and a separate command to "play[] buffer contents"—further refuting Petitioners' reinterpretation. EX1004, 10.

IPR2024-00917 POSR 15; IPR2024-00918 POSR 14; IPR2024-00919 POSR 15

Clearing the buffer requires that the buffer is emptied. It does not require discarding the contents of the buffer. Skilled artisans would have understood discarding decoded files made no sense.

Leaning

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.

Ex. 1004 Leaning 11:19-20

IPR2024-00917 POSR 15; IPR2024-00918 POSR 14; IPR2024-00919 POSR 14

Leaning Does Not Introduce Content Discontinuities

In The Context Of Changing Bitrates, Clearing The Buffer Can And Should Be Implemented By Playing Out The Sub-Files In The Buffer

Patent Owner Sur-Reply

Dr. Houh's supplemental declaration parrots this new theory without explanation EX1026, ¶80. But it contradicts his prior deposition testimony in this case, where he confirmed that "clear buffer" is performed in Leaning to ensure there is no "data ***in the buffer***" when changing sampling rates, else it "sound[] kind of like when someone breath[e]s helium". EX2129, 97:24-98:24. There is no indication

IPR2024-00917 POSR 15; IPR2024-00918 POSR 14; IPR2024-00919 POSR 15

Dr. Houh's prior testimony is consistent with clearing the buffer by playing the contents of the buffer. The buffer is cleared before the card is reset.

Dr. Houh's Testimony



Dr. Henry Houh

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 that 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 factor of two.

Ex. 2129 Houh Tr. 98:6-14

IPR2024-00917 POSR 15; IPR2024-00918 POSR 14; IPR2024-00919 POSR 15

Leaning Teaches Continuous Playback

1. Leaning teaches—and the Petition relied upon—an embodiment that avoids resetting the sound card, avoiding interruption

2. Leaning teaches that the minimum playout time for playback to begin can be smaller than the size of one sub-file, avoiding discontinuity

3. Clearing the buffer can include doing so by playing out the contents of the buffer until it has emptied, avoiding discontinuity

4. **Leaning teaches encoding and segmenting video without introducing any interruption**

Leaning's Teaches Continuous Video Streaming

Leaning's Teachings Apply to Video Streaming

Leaning

(57) Abstract: Delivery of recorded audio or video material over a telecommunications link (2) from a server (1) to a terminal (3) is accomplished by dividing the material into a sequence of sub-files each of which is independently requested by the terminal, which thereby has control of the rate of delivery. Provision may be made for switching between alternative sub-file sets representing alternative delivery modes of data rates.

Ex. 1004 Leaning Abstract

The same principle may be applied to the delivery of video recordings, or of course, video 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.

As in the audio case, there may be two or more recordings corresponding to different data rates, selected by the control mechanism already described. Also one can provide additional

Ex. 1004 Leaning 16:6-12

IPR2024-00917 Pet. 16, 21; IPR2024-00918 Pet. 16, 24-25; IPR2024-00919 Pet. 19, 26

The Challenged Patents Do Not Teach How To Encode Or Segment Video

Challenged Patents Do Not Address Or Claim Encoding Or Segmenting Video To Avoid Mistracking

compressed. Examples of a compressed content file **200** include, but are not limited to, DivX®, Windows Media Video 9®, Quicktime 6.5 Sorenson 3®, or Quicktime 6.5/MPEG-4® encoded content.

IPR2024-00919 Ex. 1001, '772 Patent 6:42-45

The specification of the '593 patent is entirely silent on how to transmit user locations and maps from a server to a user's mobile device, suggesting that a person of ordinary skill in the art was more than capable of selecting between the known methods of accomplishing this.

Uber Techs., Inc. v. X One, Inc., 957 F.3d 1334, 1339 (Fed. Cir. 2020).

IPR2024-00917, -00918, -00919, Reply 8

Leaning Teaches How To Encode And Segment Video

Leaning

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.

Ex. 1004 Leaning 16:17-31

Leaning address three types of video encoding and explains how to segment:

1. For recordings where each frame is coded independently, it is enough that a sub-file contains a whole number of frames of a picture
2. For inter-frame coding standards, each sub-file should begin with an intra-frame (I-frame)
3. For coding standards without regular I-frames, Leaning teaches the use of bridging files

Ex. 1004 Leaning 6:6-12

Leaning Teaches How To Encode And Segment Video

1 For recordings where each frame is coded independently, it is enough that a sub-file contains a whole number of frames of a picture

Leaning

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

Ex. 1004 Leaning 16:18-20

MOTION JPEG2000 FOR WIRELESS APPLICATIONS

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ABSTRACT

In this paper, we analyze the performance of Motion JPEG2000 for wireless applications. This new standard is based on intra-frame wavelet coding. Motion JPEG2000 is offering a number of very compelling advantages when compared to state-of-the-art MPEG-4 video coding. Wavelet coding achieves very high coding efficiency. Furthermore, because frames are intra coded, it is very error-resilient. Finally, Motion JPEG2000 requires low complexity, supports very efficient scalability, and introduces minimal coding delay. In this paper, we propose an analysis of the performance of Motion JPEG2000 and a comparison with MPEG-4 in terms of coding efficiency, error resilience and complexity. We present experimental results which show that Motion JPEG2000 outperforms MPEG-4 for wireless applications.

Ex. 1046 at 1

PO's New POSR Argument That Mistracking Occurs Where Each Frame Is Independently Coded Fails On The Merits

Improper New POSR Argument

PO Improperly Argues, For The First Time In the POSR, That Mistracking Occurs Where Each Frame Is Independently Coded

Leaning

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

Ex. 1004 Leaning 16:18-20

Patent Owner Sur-Reply

Petitioners' fourth new obviousness theory proposes modifying Leaning to use either (1) "Motion JPEG2000" or (2) some unidentified alternative codec that purportedly "hold[s] the group of pictures/frames for each sub-file constant across the encoding at different bitrates." Reply, 7. These concepts appear nowhere in Leaning or the Petition. Nor does either address Leaning's express disclosure of "serious mistracking" and other "complex[ities]" inherent in video streaming.

* * *

Leaning never disclosed Motion JPEG2000 for good reason: the Motion JPEG2000 format was not a practical option for streaming applications, like Leaning's, that required the effective delivery of compressed content at high transmission rates. *See* EX2141 (Jeffay), ¶147. As Petitioners' own belated exhibit

IPR2024-00917 POSR 16 ; IPR2024-00918 POSR 16; IPR2024-00919 POSR 15-16

IPR2024-00917, -00918, -00919 Reply 8

Leaning Teaches How To Encode And Segment Video

2 For inter-frame coding standards, each sub-file should begin with an intra-frame (I-frame)

Leaning

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.

Ex. 1004 Leaning 16:18-20

Dr. Houh Declaration

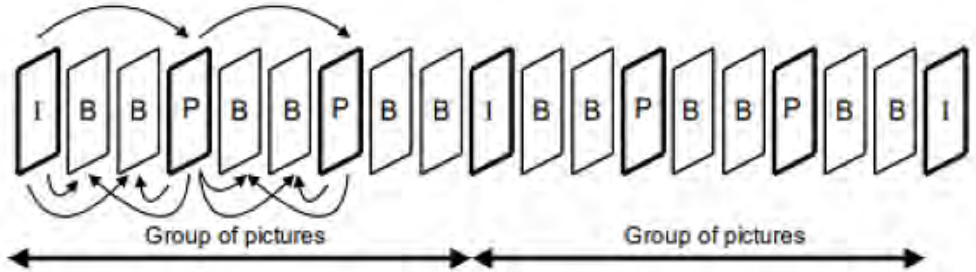


Figure 4: MPEG Group Of Pictures.

Ex. 1026 Houh Suppl. Decl. ¶107

Dr. Houh Declaration

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.

Ex. 1026 Houh Suppl. Decl. ¶94

IPR2024-00917, -00918, -00919 Reply 7

Leaning Teaches How To Encode And Segment Video

2 For inter-frame coding standards, each sub-file should begin with an intra-frame (I-frame)

Dr. Jeffay, PO's Expert, Declaration

open source video codec. https://www.ffmpeg.org/. The command for encoding the uncompressed akiyo video follows:

ffmpeg -i akiyo_cif.y4m -b:v 128k -g 99999 -c:v h261 akiyo_cif.h261.

Ex. 2141 Jeffay Decl. ¶96

PO relies on its expert to argue that, despite Leaning's teachings, mistracking would occur. But PO's expert's analysis guaranteed that there would be mistracking and ensured that each sub-file would not begin with an I-frame.

Dr. Houh Declaration

```
Input #0, yuv4mpegpipe, from 'akiyo_cif.y4m':
  Duration: 00:00:10.01, start: 0.000000, bitrate: 36460 kb/s
  Stream #0:0: Video: rawvideo (I420 / 0x30323449), yuv420p(progressive), 352x288, SAR 128:117 DAR 1408:1053, 29.97 fps, 29.97 tbr, 29.97 tbn
Stream mapping:
  Stream #0:0 -> #0:0 (rawvideo (native) -> h261 (native))
Press [q] to stop, [?] for help
[h261 @ 0xa0004b840] keyframe interval too large!, reducing it from 99999 to 600
Output #0, h261, to 'akiyo_cif-99999.h261':
  Metadata:
    encoder         : Lavf61.7.100
  Stream #0:0: Video: h261, yuv420p(tv, progressive), 352x288 [SAR 128:117 DAR 1408:1053], q=2-31, 128 kb/s, 29.97 fps, 29.97 tbn
      Metadata:
        encoder         : Lavc61.19.101 h261
      Side data:
        cpb: bitrate max/min/avg: 0/0/128000 buffer size: 0 vbv_delay: N/A
[out#0/h261 @ 0xa0004a080] video:193KiB audio:0KiB subtitle:0KiB other streams:0KiB global headers:0KiB muxing overhead: 0.000000%
frame=  300 fps=0.0 q=8.0 Lsize=     193KiB time=00:00:10.01 bitrate= 158.2kbits/s speed= 304x
```

Ex. 1026 Houh Suppl. Decl. ¶116

Leaning Teaches How To Encode And Segment Video

2 For inter-frame coding standards, each sub-file should begin with an intra-frame (I-frame)

When Leaning's teachings are properly applied, there is no mistracking

Dr. Houh Declaration

Video Encoded With I-Frame Every 30 Frames



Ex. 1061

Video Encoded With I-Frame Every 60 Frames



Ex. 1062

Video Encoded With I-Frame Every 120 Frames



Ex. 1063

Ex. 1026 Houh Suppl. Decl. ¶120

IPR2024-00917, -00918, -00919 Reply 8

Leaning Teaches How To Encode And Segment Video

3 For coding standards without regular I-frames, Leaning teaches the use of bridging files

Leaning

In either case the problem can be solved by using the principle described in our international patent application No. WO98/26604 (issued in USA as patent 6,002,440). This involves the encoding of an intermediate sequence of frames which bridges the gap between the last frame of the preceding sequence and the first frame of the new sequence.

Ex. 1004 Leaning 17:8-10

IPR2024-00917, -00918, -00919 Reply 8

3 Leaning Alone, Or In Combination, Renders Challenged Claims Obvious

Leaning Alone Renders Obvious:

- Continuous playback (All Challenged Claims)
- **Requesting streamlets/files via multiple/a plurality of TCP connections ('156 patent, cl. 2; '564 patent, cls. 2, 9, 11; '772 patent, all challenged claims)**
- Requesting low quality files/streamlets ('156 patent, cl. 10; '564 patent cl. 7; '772 patent, cl. 6)
- Independently playable streamlets ('156 patent, cls. 5 and 15)
- Upshifting according to amount of contiguously available files ('564 patent, cl. 5)
- Anticipating file requests and pre-requesting files ('564 patent, cl. 6)
- Arranging files ('772 patent, cl. 8)

Leaning Alone Or With Ala-Honkola Renders Obvious:

"Requesting Sequential Streamlets" Over Multiple TCP Connections ('156 patent, cl. 2)

Leaning Alone Or With Gamble Renders Obvious:

Requesting Sub-Parts of Files Over A Plurality of TCP Connections ('564 patent, cls. 9, 11; '772 patent, cls. 2, 9)

Requesting Streamlets/Files Via Multiple/ A Plurality Of TCP Connections

2. The apparatus of claim 1, wherein the apparatus is configured to establish multiple Transmission Control Protocol (TCP) connections with a content server, and request streamlets of varying bitrates.

IPR2024-00917 Ex. 1001, '156 Patent Claim 2

2. The end user station of claim 1, wherein the at least one TCP connection comprises multiple Transmission Control protocol (TCP) connections with the content server.

* * *

9. The method of claim 8, wherein the at least one TCP connection comprises a plurality of different TCP connections, and wherein the requesting the plurality of sequential files includes requesting sub-parts of the files over different ones of the plurality of different TCP connections, and wherein said presenting includes reassembling the files from the received sub-parts.

* * *

11. The method of claim 8, wherein the at least one TCP connection comprises a plurality of different TCP connections, and wherein the automatically requesting includes requesting sub-parts of the files over different ones of the plurality of TCP connections, and wherein said presenting includes reassembling the files from the received sub-parts, and wherein the factor is indicative of the available bandwidth of the plurality of TCP connections.

IPR2024-00918 Ex. 1001, '564 Patent Claims 2, 9, 11

1. A method for presenting rate-adaptive streams, the method comprising:

* * *

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;

automatically requesting by the media player from the set of servers over the plurality of TCP connections subsequent portions of the video by requesting for each such portion one of the files from one of the copies dependent upon successive determinations by the media player to shift the playback quality to a higher or lower quality one of the different copies, said automatically requesting including,

IPR2024-00919 Ex. 1001, '772 Patent Claim 1

'156, cl. 2	'564, cls. 2, 9, 11	'772, all cls.

Leaning Teaches Requesting Streamlets/Files Via Multiple/ A Plurality Of TCP Connections

Leaning Teaches The Use Of HTTP 1.0, Which Uses Multiple/A Plurality Of TCP Connections

Leaning

user terminal where the corresponding sounds are to be played to the user. However, as will be discussed in more detail below, the system may be used to convey video signals instead of, or in addition to, audio signals. In this example, the network is the internet or other packet network operating in accordance with the Hypertext Transfer Protocol (see RFCs 1945/2068 for details), though in principle other digital links or networks can be used. It is also assumed that the audio

Ex. 1004 Leaning 2:7-11

RFC 1945

Network Working Group
Request for Comments: 1945
Category: Informational

T. Berners-Lee
MIT/LCS
R. Fielding
UC Irvine
H. Frystyk
MIT/LCS
May 1996

Hypertext Transfer Protocol -- HTTP/1.0

* * *

On the Internet, HTTP communication generally takes place over TCP/IP connections. The default port is TCP 80 [15], but other ports can be used. This does not preclude HTTP from being implemented on top of

Ex. 1028 (Jeffay-Ex. 1 (RFC 1945))) 1, 8

PO does not dispute that in HTTP 1.0, each request establishes a new connection producing a plurality of/multiple TCP connections

'156, cl. 2	'564, cls. 2, 9, 11	'772, all cls.

IPR2024-00917 Pet. 18-19, Reply 13; IPR2024-00918 Pet. 18-19, Reply 13; IPR2024-00919 Pet. 31-33, Reply 13

Leaning Teaches Requesting Streamlets/Files Via Multiple/ A Plurality Of TCP Connections

Undisputed That HTTP 1.0 Uses Multiple/A Plurality Of TCP Connections

Dr. Houh Supplemental Declaration

128. It is well-known (and was well-known at the time) that in HTTP 1.0, each new HTTP request establishes a new TCP connection, resulting in the claimed multiple or plurality of TCP connections. Dr. Jeffay does not dispute that. In fact, this is consistent with the portion of the specification Dr. Jeffay cites: "[w]hen a TCP connection fails completely, a new request may be sent on a different connection for the same streamlet." Ex. 2141 ¶ 106 (citing Ex. 1001 at 9:59-63). That is how HTTP 1.0 would work.

Ex. 1026 Houh Suppl. Decl. ¶128

'156, cl. 2	'564, cls. 2, 9, 11	'772, all cls.

IPR2024-00917, -00918, -00919 Reply 13

Leaning Teaches Requesting Streamlets/Files Via Multiple/ A Plurality Of TCP Connections

Leaning Teaches The Use Of HTTP 1.0, Which Uses Multiple/A Plurality Of TCP Connections

Patent Owner Sur-Reply

Instead, as Dr. Jeffay testified, a POSITA would understand Leaning's reference to HTTP to mean HTTP 1.1, since it was the primary standard for internet traffic at the relevant time, and HTTP 1.1 used "persistent" connections by default—i.e., a single TCP connection from client to server. EX2141, ¶¶108-110. A POSITA

IPR2024-00917 POSR 19; *see also* IPR2024-00918 POSR 18; IPR2024-00919 18-19

Dr. Jeffay, Patent Owner's Expert, Testimony



Dr. Jeffay

Q Do you agree that Leaning discloses the use of HTTP/1.0?

A **At least in its reference to RFC 1945.**

Ex. 1027 Jeffay Tr. 79:3-6

'156, cl. 2	'564, cls. 2, 9, 11	'772, all cls.

IPR2024-00917, -00918, -00919 Reply 13

Leaning's Use Of Error Messages Does Not Suggest It Does Not Use Multiple TCP Connections

Leaning

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	

Ex. 1004 Leaning 10

Dr. Houh Expert Declaration

132. This has nothing to do with whether Leaning discloses multiple TCP connections or addresses transmission errors as HTTP and TCP operate at different layers of data transmission. Leaning relates to the application layer, which is the topmost most directly end user-facing layer. The application layer leverages application layer protocols, like HTTP. Any "error" Leaning discloses generating would therefore relate to the application layer. In contrast, TCP operates at the separate transport layer, which sits deeper within the data transmission structure and governs, e.g., data transfer and delivery. The transport layer leverages transport-layer protocols like TCP. Ex. 1060 at 4-7.

Ex. 1026 Houh Suppl. Decl. ¶132

'156, cl. 2	'564, cls. 2, 9, 11	'772, all cls.

IPR2024-00917 Reply 12; IPR2024-00918 Reply 11-12; IPR2024-00919 Reply 11-12

Leaning's Use Of Error Messages Says Nothing About Multiple TCP Connections

Patent Owner Sur-Reply

In Reply, Petitioners argue that Leaning's sole error handling process "has nothing to do with TCP." Reply, 12. This concedes DISH's point. The fact that

IPR2024-00917 POSR 18; *see also* IPR2024-00918 POSR 17; IPR2024-00919 POSR 18

Petitioner Reply

the subfile not existing at the server. *Id.* 32 (citing Leaning 10). This has nothing to do with TCP. Houh2 ¶¶130-134.

POSITAs would have understood that it would make no sense for a TCP error to meet this condition. *Id.* Leaning interfaces with the server using application-layer protocols such as HTTP, and therefore any error messages described in Leaning (unless explicitly stated otherwise), would have been application-layer errors, such as HTTP errors. *See* POR31-32 (discussing an example HTTP error); Houh2 ¶¶130-134. For example, PO does not dispute that Leaning discloses the use of HTTP, which operates over TCP connections. POR34-35; Pet.18-20. In contrast, the software used to implement TCP in any given system handles such errors without applications, at the transport layer. Houh2 ¶¶130-134. Leaning is not "disinterested" in handling TCP errors—it operates as application-layer software typically does by allowing the TCP protocol to handle TCP layers. *Id.* Its use of an application-layer error message to indicate the end of a content file says nothing about its use of TCP connections.

IPR2024-00917 Reply 12; *see also* IPR2024-00918 Reply 11-12; IPR2024-00919 Reply 11-12

'156, cl. 2	'564, cls. 2, 9, 11	'772, all cls.

IPR2024-00917 Reply 12; IPR2024-00918 Reply 11-12; IPR2024-00919 Reply 11-12

PO's New Argument Regarding Dr. Houh's Testimony Fails On The Merits

Improper New POSR Argument

Dr. Houh's Prior Testimony Did Not Assert That The Use of Multiple TCP Connections Was Novel Or Inventive

Patent Owner Sur-Reply

(citing EX1026, ¶¶126-134). But in the Ogdon IPRs, Dr. Houh identified the exact same functionality as a "critical" feature purportedly missing from DISH's commercial embodiment—not inherent in the TCP protocol itself as he now argues.

IPR2024-00917 POSR 19; *see also* IPR2024-00918 POSR 17-18; IPR2024-00919 POSR 18

Dr. Houh Ogdon IPR Declaration

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, Ex. 1028 ¶74

'156, cl. 2	'564, cls. 2, 9, 11	'772, all cls.

IPR2024-00917 Reply 12; IPR2024-00918 Reply 11-12; IPR2024-00919 Reply 11-12

3 Leaning Alone, Or In Combination, Renders Challenged Claims Obvious

Leaning Alone Renders Obvious:

- Continuous playback (all challenged claims)
- Requesting streamlets/files via multiple/a plurality of TCP connections ('156 patent, cl. 2; '564 patent, cls. 2, 9, 11; '772 patent, all challenged claims)
- **Requesting low quality files/streamlets ('156 patent, cl. 10; '564 patent, cl. 7; '772 patent, cl. 6)**
- Independently playable streamlets ('156 patent, cls. 5 and 15)
- Upshifting according to amount of contiguously available files ('564 patent, cl. 5)
- Anticipating file requests and pre-requesting files ('564 patent, cl. 6)
- Arranging files ('772 patent, cl. 8)

Leaning Alone Or With Ala-Honkola Renders Obvious:

"Requesting Sequential Streamlets" Over Multiple TCP Connections ('156 patent, cl. 2)

Leaning Alone Or With Gamble Renders Obvious:

Requesting Sub-Parts of Files Over A Plurality of TCP Connections ('564 patent, cls. 9, 11; '772 patent, cls. 2, 9)

Leaning Renders Obvious Requesting Low Quality Files

10. The apparatus of claim **1**, wherein the apparatus is configured to initially request low quality streamlets to enable instant playback of the content file, and subsequent upshifting according to the performance factor.

IPR2024-00917 Ex. 1001, '156 Patent Claim 10

7. The end user station of claim **1**, wherein the media player is configured to initially request low quality files to enable instant playback of the video, and to subsequently upshift to a better quality copy of the video according to the performance factor.

IPR2024-00918 Ex. 1001, '564 Patent Claim 7

6. The method of claim **1**,
wherein said requesting the plurality of sequential one of the files includes requesting the files from a low quality one of the different copies to enable instant playback of the video, and wherein said automatically requesting includes-upshifting to a higher quality one of the different copies.

IPR2024-00919 Ex. 1001, '772 Patent Claim 6

'156, cl. 1	'564, cl. 7	'772, cl. 6

Leaning Renders Obvious Requesting Low Quality Files

Leaning

filename is not specified.) It then begins to request the audio sub-files as described earlier, from the first-mentioned "rate" directory in the index file – viz. 024k_11_s (or the terminal could override this by modifying this to a default rate set locally for that terminal). The process from then on is that the player program measures the actual data rate being received from the server, averaged over a period of time (for example 30 seconds). It does this by timing every URL request; the transfer rate achieved (number of bits per second) between the client and server is determined. The accuracy of this figure improves as the number of requests goes up. The player maintains two stored parameters which indicate, respectively, the current rate, and the measured rate.

Ex. 1004 Leaning 8:9-16

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>
```

Ex. 1004 Leaning Fig. 3

'156, cl. 1 | **'564**, cl. 7 | **'772**, cl. 6

IPR2024-00917 Pet. 44-45; IPR2024-00918 Pet. 47-48; IPR2024-00919 Pet. 45-46

Leaning Renders Obvious Requesting Low Quality Files

Claims Recite "low" Quality Not The "lowest quality version"

Patent Owner Sur-Reply

Moreover, Leaning discloses selecting not the lowest quality version, but the fourth-lowest quality out of a set of five (*i.e.*, the second "best" quality). EX1004, Fig. 3. Thus, it is not a "low quality one of the different copies" as claimed. And

IPR2024-00917 POSR 21; IPR2024-00918 POSR 19; IPR2024-00919 POSR 19-20

10. The apparatus of claim **1**, wherein the apparatus is configured to initially request low quality streamlets to enable instant playback of the content file, and subsequent upshifting according to the performance factor.

IPR2024-00917 Ex. 1001, '156 Patent Claim 10

7. The end user station of claim **1**, wherein the media player is configured to initially request low quality files to enable instant playback of the video, and to subsequently upshift to a better quality copy of the video according to the performance factor.

IPR2024-00918 Ex. 1001, '564 Patent Claim 7

6. The method of claim **1**, wherein said requesting the plurality of sequential one of the files includes requesting the files from a low quality one of the different copies to enable instant playback of the video, and wherein said automatically requesting includes-upshifting to a higher quality one of the different copies.

IPR2024-00919 Ex. 1001, '772 Patent Claim 6

IPR2024-00917 Reply 14; IPR2024-00918 Reply 13; IPR2024-00919 Reply 14

'156, cl. 1	'564, cl. 7	'772, cl. 6

Leaning Renders Obvious Requesting Low Quality Files To Enable Instant Playback

Leaning

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.

Ex. 1004 Leaning 12:34-35

Dr. Houh Declaration

"Begin/continuing playing." Ex. 1004 at p. 10. In other words, if the very first sub-file provides more media than the playout time, the file will play. As noted above, Leaning also expressly discloses that sub-files, including a first sub-file, can be 130% the size of the playout time. Ex. 1004 at 12:26-34. As a result, upon receipt and decoding of 000000.bin (the first sub-file), the buffer fullness is greater than T_p at step J1A and the device goes to step J3 and begins playing. Ex. 1004 at p. 10. This is effectively instantaneous playback, within the constraints of computer networking.

Ex. 1026 Houh Suppl. Decl. ¶49

'156, cl. 1	'564, cl. 7	'772, cl. 6

IPR2024-00917 Reply 14; IPR2024-00918 Reply 13; IPR2024-00919 Reply 14

Leaning Renders Obvious Requesting Low Quality Files

Challenged Patents Refer To A 100 Kilobits Per Second Stream As A Low Quality Stream

file **200** encoded and compressed to varying bit rates. For example, the low quality stream **204** may be encoded and compressed to a bit rate of 100 kilobits per second (kbps), the medium quality stream **206** may be encoded and compressed to a bit rate of 200 kbps, and the high quality stream **208** may be encoded and compressed to 600 kbps.

IPR2024-00917 Ex. 1001 '156 Patent 7:3-8

'156, cl. 1 | '564, cl. 7 | '772, cl. 6

IPR2024-00917 Reply 14; IPR2024-00918 Reply 13; IPR2024-00919 Reply 14

3 Leaning Alone, Or In Combination, Renders Challenged Claims Obvious

Leaning Alone Renders Obvious:

- Continuous playback (All Challenged Claims)
- Requesting streamlets/files via multiple/a plurality of TCP connections ('156 patent, cl. 2; '564 patent, cls. 2, 9, 11; '772 patent, all challenged claims)
- Requesting low quality files/streamlets ('156 patent, cl. 10; '564 patent cl. 7; '772 patent, cl. 6)
- **Independently playable streamlets ('156 patent, cls. 5 and 15)**
- Upshifting according to amount of contiguously available files ('564 patent, cl. 5)
- Anticipating file requests and pre-requesting files ('564 patent, cl. 6)
- Arranging files ('772 patent, cl. 8)

Leaning Alone Or With Ala-Honkola Renders Obvious:

"Requesting Sequential Streamlets" Over Multiple TCP Connections ('156 patent, cl. 2)

Leaning Alone Or With Gamble Renders Obvious:

Requesting Sub-Parts of Files Over A Plurality of TCP Connections ('564 patent, cls. 9, 11; '772 patent, cls. 2, 9)

Leaning Renders Obvious Independently Playable Streamlets

5. The apparatus of claim **1** wherein each of the streamlets of each of the different copies is independently requestable and playable by the apparatus.

IPR2024-00917 Ex. 1001, '156 Patent Claim 5

15. The method of claim **14** wherein each of the streamlets of each of the different copies is independently requestable and playable by the end user device.

IPR2024-00917 Ex. 1001, '156 Patent Claim 15

'156, cls. 5, 15

Leaning Renders Obvious Independently Playable Streamlets

Leaning

(57) Abstract: Delivery of recorded audio or video material over a telecommunications link (2) from a server (1) to a terminal (3) is accomplished by dividing the material into a sequence of sub-files each of which is independently requested by the terminal, which thereby has control of the rate of delivery. Provision may be made for switching between alternative sub-file sets representing alternative delivery modes of data rates.

Ex. 1004 Leaning Abstract

Leaning

1. A terminal for playing audio or video material which is stored on a remote server as a set of files representing successive temporal portions of the said material, the terminal comprising:

a telecommunications interface for communication with the server;

a buffer for receiving the files from the telecommunications interface; and

means for playing the contents of the buffer;

characterised by control means operable to determine the addresses of further files to be requested and operable in response to the state of the buffer to generate request messages, containing such addresses, for further files for replenishment of the buffer.

Ex. 1004 Leaning cl. 1

'156, cls. 5, 15

IPR2024-00917 Pet. 39, 41

POSITAs Would Have Known How To Create Independently Playable Streamlets

Undisputed That The Challenged Patents Are Entirely Silent On How To Create Independently Playable Streamlets And Do Not Address The Alleged Mistracking Issue PO Raises

The specification of the ’593 patent is entirely silent on how to transmit user locations and maps from a server to a user’s mobile device, suggesting that a person of ordinary skill in the art was more than capable of selecting between the known methods of accomplishing this.

Uber Techs., Inc. v. X One, Inc., 957 F.3d 1334, 1339 (Fed. Cir. 2020).

’156 Patent, Claims 5 and 15

’156, cls. 5, 15

Leaning Renders Obvious Independently Playable Streamlets

For Video Standards That Include Dependently-Coded Frames, PO Does Not Dispute That POSITAs Would Have Known How To Ensure Streamlets Were Independently Playable

Leaning

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

Ex. 1004 Leaning 16:16-20

Dr. Houh Expert Declaration

165. Further, as discussed above, Leaning discloses that each sub-file can be encoded separately. Ex. 1004 at 13:23-14:15. In that case, each sub-file will have all of the I-, P-, and B-frames necessary to de-code that file independently, rendering the sub-file independently playable.

Ex. 1026 Houh Suppl. Decl. ¶165

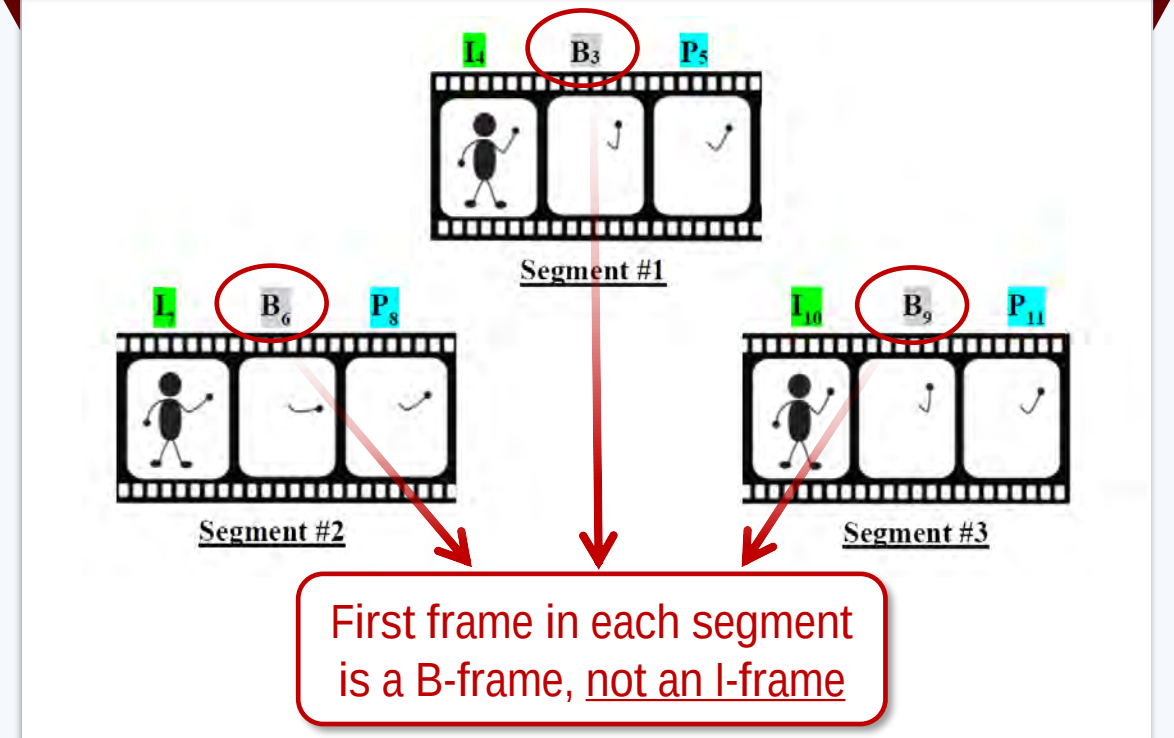
'156, cls. 5, 15

IPR2024-00917 Pet. 39, 41

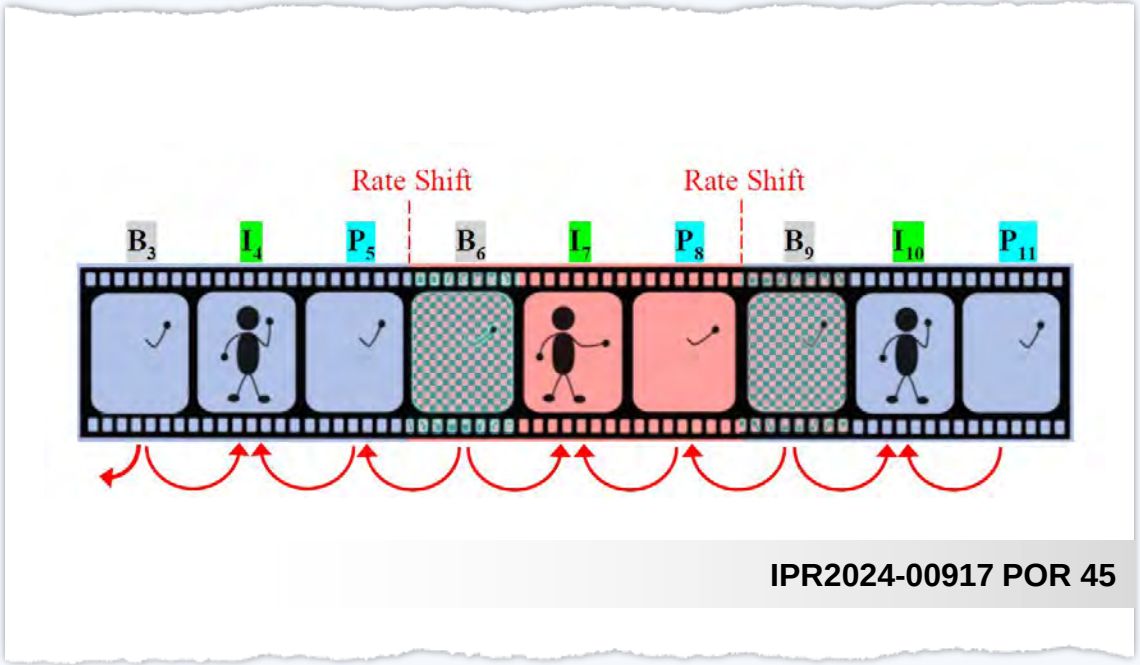
Leaning Renders Obvious Independently Playable Streamlets

PO's Argument Depends On Ignoring Leaning's Express Teaching And Choosing Not To Begin Each Sub-file With An I-frame

Patent Owner Response



IPR2024-00917 POR 44 (annotated)



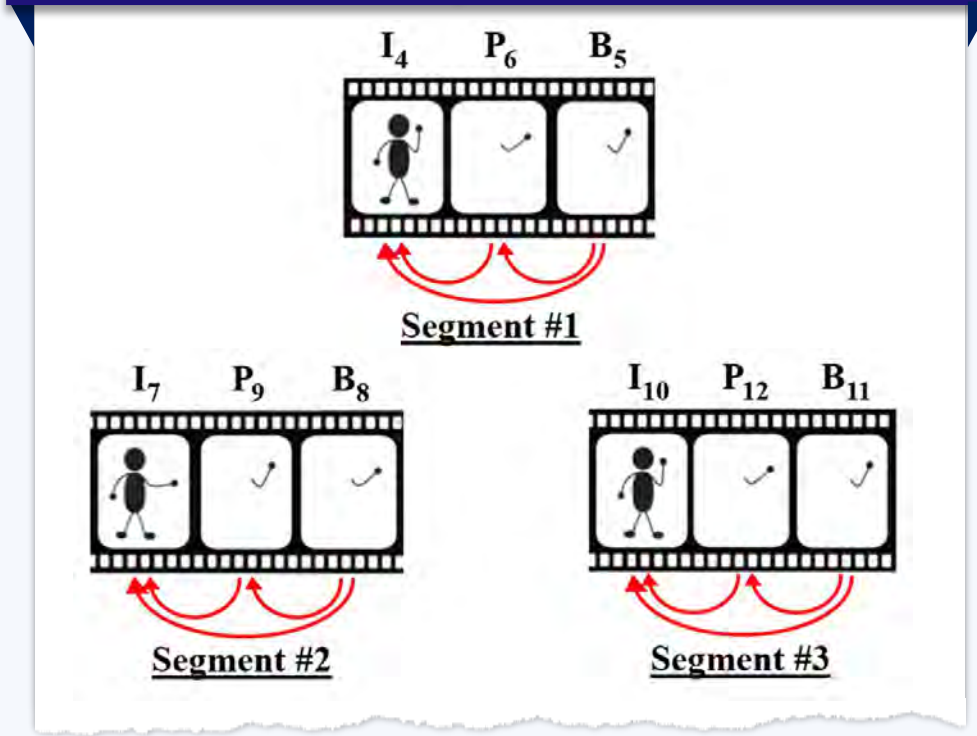
IPR2024-00917 POR 45

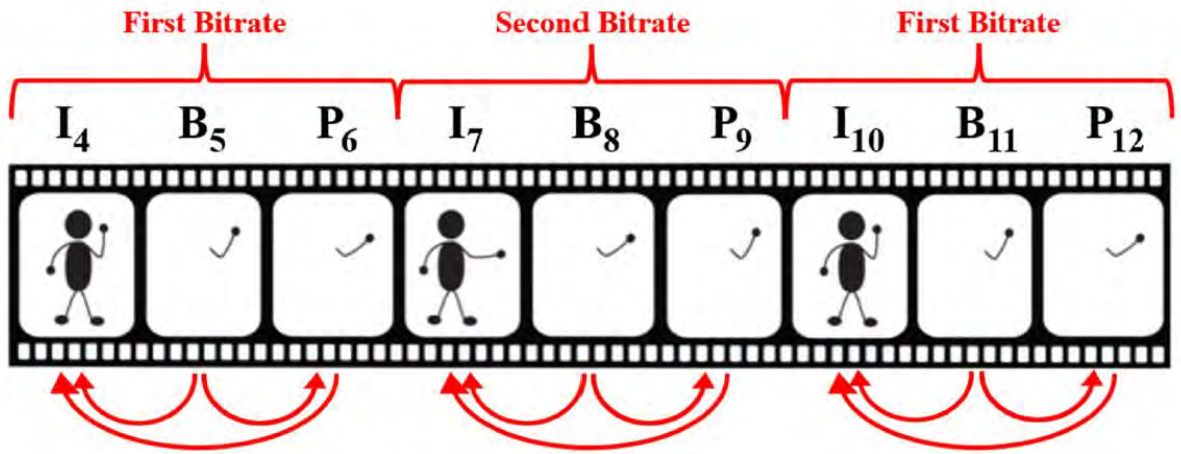
'156, cls. 5, 15

Leaning Renders Obvious Independently Playable Streamlets

POSITAs Would Have Followed Leaning's Teachings And Started Each Frame With An I-frame To Ensure Each Segment Is Independently Playable And No Frame Depends On A Frame From Another Segment

Dr. Houh Expert Declaration





Ex. 1026 Houh Suppl. Decl. ¶¶173-174

'156, cls. 5, 15

IPR2024-00917 Reply 17-19

PO's New Attorney Argument Regarding Arranging Frames Fails On The Merits

PO's Argument That Leaning Does Not Contemplate Arranging Individual Frames Is An Improper New Argument And Belied By Leaning's Express Disclosure

Patent Owner Sur-Reply

Indeed, Leaning describes eliminating the need for additional logic on the client side by using a file naming convention (*e.g.*, 000000.bin, 000001.bin, 000002.bin, *et seq.*) that ensures "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***." Reply, 9; EX1004, 12:9-11. Thus, does not contemplate actively arranging sub-files on the client side, much less the individual frames within those sub-files—*i.e.*, P-Frames and B-Frames.

IPR2024-00917 POSR 20

Leaning

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.

Ex. 1004 Leaning 16:20-23

'156, cls. 5, 15

IPR2024-00917 Reply 16

3 Leaning Alone, Or In Combination, Renders Challenged Claims Obvious

Leaning Alone Renders Obvious:

- Continuous playback (All Challenged Claims)
- Requesting streamlets/files via multiple/a plurality of TCP connections ('156 patent, cl. 2; '564 patent, cls. 2, 9, 11; '772 patent, all challenged claims)
- Requesting low quality files/streamlets ('156 patent, cl. 10; '564 patent cl. 7; '772 patent, cl. 6)
- Independently playable streamlets ('156 patent, cls. 5 and 15)
- **Upshifting according to amount of contiguously available files ('564 patent, cl. 5)**
- Anticipating file requests and pre-requesting files ('564 patent, cl. 6)
- Arranging files ('772 patent, cl. 8)

Leaning Alone Or With Ala-Honkola Renders Obvious:

"Requesting Sequential Streamlets" Over Multiple TCP Connections ('156 patent, cl. 2)

Leaning Alone Or With Gamble Renders Obvious:

Requesting Sub-Parts of Files Over A Plurality of TCP Connections ('564 patent, cls. 9, 11; '772 patent, cls. 2, 9)

Leaning Renders Obvious Upshifting According To The Amount of Contiguously Available Files

5. The end user station of claim **1** wherein the media player is configured to upshift to the higher quality copy when the performance factor is greater than the first threshold and the media player determines that the higher quality playback can be sustained according to an amount of contiguously available files stored by the media player.

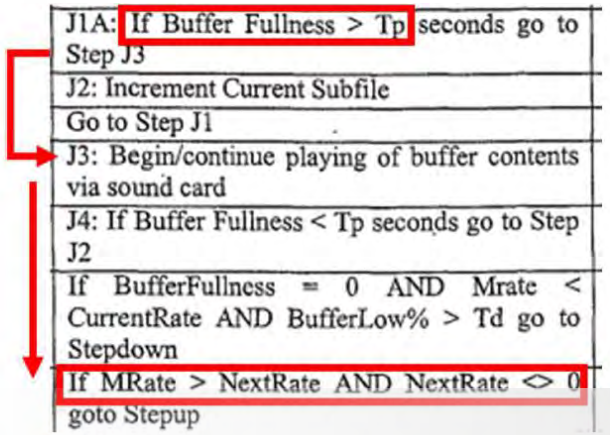
IPR2024-00918 Ex. 1001, ’564 Patent Claim 5

’564, cl. 5

Leaning Renders Obvious Upshifting According To The Amount of Contiguously Available Files

Petition

(Buffer Fullness > Tp seconds); EX1003, ¶ 88. A POSITA would have understood that because Leaning's subfiles are all the same length (*i.e.*, four seconds), it would be an obvious design choice whether the Buffer Fullness was measured based on playback time or the number of contiguously available files stored by the media player. Using counters to measure the number of files in a buffer or queue was well known in the art. EX1003, ¶ 88.



IPR2024-00918 Pet. 43

'564, cl. 5

PO Does Not Dispute That It Would Have Been Obvious To Upshift According To The Amount of Contiguously Available Files

Dr. Houh Expert Declaration

89. To the extent that Patent Owner argues that Leaning does not teach determining that the higher quality playback can be sustained according to an amount of contiguously available files stored by the media player, a POSITA would have been motivated to configure Leaning's media player (player program) to upshift to a higher quality copy of the video when the factor (measured rate) is greater than the first threshold (next highest rate) and the media player determines the higher quality playback can be sustained according to an amount of contiguously available files (subfiles) stored by the media player. For example, a POSITA would have understood that when sequential stream segments are present in the media player's buffer, the available network bandwidth is sufficient to retrieve the segments at the given quality level (bit rate) and play them back without interruption, such that the higher quality level can be sustained, and there is no need to reduce the quality level (bit rate). Accordingly, a POSITA would have been motivated to factor in the presence of such stored files in the determination whether to sustain the quality level. Indeed, Leaning recognizes that automatically switching between bitrates offers a "remedy for the possibility of buffer underflow (due for example to network congestion)." EX1004, 6:9-15. A POSITA would have had a reasonable expectation of success with such a modification because Leaning teaches that assessment and management of the buffer contents are part of the determination whether to shift or sustain quality level. EX1004, 8:17-9:2, 10.

IPR2024-00918 Ex. 1003 Houh Decl. ¶89

'564, cl. 5

3 Leaning Alone, Or In Combination, Renders Challenged Claims Obvious

Leaning Alone Renders Obvious:

- Continuous playback (All Challenged Claims)
- Requesting streamlets/files via multiple/a plurality of TCP connections ('156 patent, cl. 2; '564 patent, cls. 2, 9, 11; '772 patent, all challenged claims)
- Requesting low quality files/streamlets ('156 patent, cl. 10; '564 patent cl. 7; '772 patent, cl. 6)
- Independently playable streamlets ('156 patent, cls. 5 and 15)
- Upshifting according to amount of contiguously available files ('564 patent, cl. 5)
- **Anticipating file requests and pre-requesting files ('564 patent, cl. 6)**
- Arranging files ('772 patent, cl. 8)

Leaning Alone Or With Ala-Honkola Renders Obvious:

"Requesting Sequential Streamlets" Over Multiple TCP Connections ('156 patent, cl. 2)

Leaning Alone Or With Gamble Renders Obvious:

Requesting Sub-Parts of Files Over A Plurality of TCP Connections ('564 patent, cls. 9, 11; '772 patent, cls. 2, 9)

Leaning Renders Obvious Anticipating File Requests and Pre-Requesting Files

6. The end user station of claim **1**, wherein the media player is further configured to anticipate file requests and to pre-request files to enable fast-forward, skip randomly, and rewind functionality.

IPR2024-00918 Ex. 1001, ’564 Patent Claim 6

’564, cl. 6

Leaning Renders Obvious Anticipating File Requests and Pre-Requesting Files

Leaning Teaches Anticipating File Requests, Pre-requesting Files, And Storing Them In The Buffer

Leaning Teaches Enabling Fast-forward, Rewind, And Skips

Leaning

Whilst playing the sounds as in (8) above, the player program continually monitors the state of buffer fullness and whenever this falls below T_p it increments the filename again and obtains a further sub-file from the server. This process is repeated until a "file not found error" is returned.

Ex. 1004 Leaning 5:32-6:2

Leaning

The operation of this will now be described in the context of fast forward operation (fast rewind being similar but in reverse). In this example we assume that a 9 minute video sequence

Ex. 1004 Leaning 17:11-12

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

Ex. 1004 Leaning 11:13-15

'564, cl. 6

Leaning Renders Obvious Anticipating File Requests and Pre-Requesting Files

Leaning Teaches Anticipating File Requests, Pre-requesting Files, And Storing Them In The Buffer

Leaning

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.

Ex. 1004 Leaning 11:19-20

'564, cl. 6

IPR2024-00918 Pet. 45

Leaning Renders Obvious Anticipating File Requests and Pre-Requesting Files

To The Extent Not Disclosed, It Would Have been Obvious To Modify Leaning To Anticipate File Requests And Pre-Request Files

Dr. Houh Declaration

92. To the extent Patent Owner argues that Leaning does not teach anticipating file requests and pre-requesting files to enable fast-forward, skip randomly, and rewind functionality, a POSITA would have been motivated to configure Leaning's apparatus to anticipate file requests and pre-request files in order to utilize available bandwidth and ensure a sufficient buffer of data for such standard playback and control functionality. These functions were well known in the art and expected by consumers of multimedia content. *See* EX1013, 2:64-3:4 (discussing seeking to a particular point of time in on-demand multimedia content and its inherent delay). A POSITA would have had a reasonable expectation of success with such a modification because Leaning teaches preloading sub-files as well as functionality for fast-forwarding, skipping randomly, and rewinding, and these functions were well known and commonly implemented in media players in the art.

IRR2024-00918 Ex. 1003 Houh Decl. ¶92

PO disputes that there would have been a motivation to modify Leaning in this way for the first time in its POSR. This is improper and fails on the merits.

IPR2024-00918 Pet. 46

'564, cl. 6

Leaning Renders Obvious Arranging Files

Leaning

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

* * *

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).

Whilst playing the sounds as in (8) above, the player program continually monitors the state of buffer fullness and whenever this falls below T_p it increments the filename again and obtains a further sub-file from the server. This process is repeated until a "file not found error" is returned.

Ex. 1004 Leaning 5:23-6:2

'564, cl. 6

IPR2024-00919 Reply 16

3 Leaning Alone, Or In Combination, Renders Challenged Claims Obvious

Leaning Alone Renders Obvious:

- Continuous playback (All Challenged Claims)
- Requesting streamlets/files via multiple/a plurality of TCP connections ('156 patent, cl. 2; '564 patent, cls. 2, 9, 11; '772 patent, all challenged claims)
- Requesting low quality files/streamlets ('156 patent, cl. 10; '564 patent cl. 7; '772 patent, cl. 6)
- Independently playable streamlets ('156 patent, cls. 5 and 15)
- Upshifting according to amount of contiguously available files ('564 patent, cl. 5)
- Anticipating file requests and pre-requesting files ('564 patent, cl. 6)
- **Arranging files ('772 patent, cl. 8)**

Leaning Alone Or With Ala-Honkola Renders Obvious:

"Requesting Sequential Streamlets" Over Multiple TCP Connections ('156 patent, cl. 2)

Leaning Alone Or With Gamble Renders Obvious:

Requesting Sub-Parts of Files Over A Plurality of TCP Connections ('564 patent, cls. 9, 11; '772 patent, cls. 2, 9)

Leaning Renders Obvious Arranging Files

8. The method of claim **1**, wherein said presenting comprises 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.

IPR2024-00919 Ex. 1001, '772 Patent Claim 8

'772, cl. 8

Leaning Renders Obvious Arranging Files

Inventor Drew Major Testimony

Q Right. So if a client requests streamlets individually, one at a time, in order of ascending playout time, is that covered by your invention?

A Yeah, that's one way it can be -- it can be used, yes.

Ex. 1032 Major Tr. 65:8-14

'772, cl. 8

IPR2024-00919 Reply 16

3 Leaning Alone, Or In Combination, Renders Challenged Claims Obvious

Leaning Alone Renders Obvious:

Continuous playback (All Challenged Claims)

- Requesting streamlets/files via multiple/a plurality of TCP connections (’156 patent, cl. 2; ’564 patent, cls. 2, 9, 11; ’772 patent, all challenged claims)
- Requesting low quality files/streamlets (’156 patent, cl. 10; ’564 patent cl. 7; ’772 patent, cl. 6)
- Independently playable streamlets (’156 patent, cls. 5 and 15)
- Upshifting according to amount of contiguously available files (’564 patent, cl. 5)
- Anticipating file requests and pre-requesting files (’564 patent, cl. 6)
- Arranging files (’772 patent, cl. 8)

Leaning Alone Or With Ala-Honkola Renders Obvious:

- “Requesting Sequential Streamlets” Over Multiple TCP Connections (’156 patent, cl. 2)

Leaning Alone Or With Gamble Renders Obvious:

Requesting Sub-Parts of Files Over A Plurality of TCP Connections (’564 patent, cls. 9, 11; ’772 patent, cls. 2, 9)

Leaning Alone Or With Ala-Honkola Renders Obvious Establishing Multiple TCP Connections And Requesting Streamlets

2. The apparatus of claim **1**, wherein the apparatus is configured to establish multiple Transmission Control Protocol (TCP) connections with a content server, and request streamlets of varying bitrates.

IPR2024-00917 Ex. 1001, '156 Patent Claim 2

'156, cl. 2

Leaning Alone Or With Ala-Honkola Renders Obvious Establishing Multiple TCP Connections And Requesting Streamlets

PO Improperly Ignores The Combination, Challenging Each Reference Individually

Patent Owner Response

In Ground 2, Petitioner reliance on the combination of Leaning and Ala-Honkola as allegedly rendering obvious the portion of dependent Claim 2 pertaining to multiple TCP connections fails because, like Leaning, Ala-Honkola does not disclose or suggest "requesting sequential streamlets" (recited in Claim 1) via multiple TCP connections. Pet., 50-52.[19]

IPR2023-00917 POR 46-47

IPR2024-00917 Pet. 52, Reply 19-20

'156, cl. 2

Leaning Alone Or With Ala-Honkola Renders Obvious Establishing Multiple TCP Connections And Requesting Streamlets

PO Does Not Dispute That Ala-Honkola Teaches HTTP Requests Over Multiple TCP Connections Or That A POSITA Would Have Combined Ala-Honkola And Leaning

Patent Owner Response

In Ground 2, Petitioner reliance on the combination of Leaning and Ala-Honkola as allegedly rendering obvious the portion of dependent Claim 2 pertaining to multiple TCP connections fails because, like Leaning, Ala-Honkola does not disclose or suggest "requesting sequential streamlets" (recited in Claim 1) via multiple TCP connections. Pet., 50-52.[19] **IPR2023-00917 POR 46-47**

depends). And while Ala-Honkola generally refers to using multiple TCP connections to transmit HTTP requests, Ala-Honkola fails to disclose a client device transmitting individual, sequential streamlet requests to a media server over those multiple TCP connections. EX2141, ¶179. **IPR2023-00917 POR 48**

IPR2024-00917 Pet. 52, Reply 19-20

'156, cl. 2

Leaning Alone Or With Ala-Honkola Renders Obvious Establishing Multiple TCP Connections And Requesting Streamlets

PO Does Not Dispute That Ala-Honkola Teaches HTTP Requests Over Multiple TCP Connections Or That A POSITA Would Have Combined Ala-Honkola And Leaning

Petition

A POSITA would have been motivated to modify Leaning such that terminals 3 made their HTTP requests for subfiles from the server 1 via one (or more than one) TCP connection, as taught by Ala-Honkola, because TCP connections, as the standard Internet protocol for establishing connections between a client and server, would have been a reliable means for allowing terminal 3 to request subfiles from the server 1. EX1003, ¶ 118; *see also* Section IX.A.1:1[A][2]. A POSITA would have had a reasonable expectation of success with such a modification because TCP is and was a reliable protocol for delivery of requested data from a server to a client. *Id.*

IPR2023-00917 Pet. 51

IPR2024-00917 Pet. 51

'156, cl. 2

3 Leaning Alone, Or In Combination, Renders Challenged Claims Obvious

Leaning Alone Renders Obvious:

- Continuous playback (all challenged claims)
- Requesting streamlets/files via multiple/a plurality of TCP connections ('156 patent, cl. 2; '564 patent, cls. 2, 9, 11; '772 patent, all challenged claims)
- Requesting low quality files/streamlets ('156 patent, cl. 10; '564 patent cl. 7; '772 patent, cl. 6)
- Independently playable streamlets ('156 patent, cls. 5 and 15)
- Upshifting according to amount of contiguously available files ('564 patent, cl. 5)
- Anticipating file requests and pre-requesting files ('564 patent, cl. 6)
- Arranging files ('772 patent, cl. 8)

Leaning Alone Or With Ala-Honkola Renders Obvious:

"Requesting Sequential Streamlets" Over Multiple TCP Connections ('156 patent, cl. 2)

Leaning Alone Or With Gamble Renders Obvious:

- Requesting Sub-Parts of Files Over A Plurality of TCP Connections ('564 patent, cls. 9, 11; '772 patent, cls. 2, 9)

Leaning Alone Or With Gamble Renders Obvious Requesting Sub-Parts Over Multiple TCP Connections

9. The method of claim **8**, wherein the at least one TCP connection comprises a plurality of different TCP connections, and wherein the requesting the plurality of sequential files includes requesting sub-parts of the files over different ones of the plurality of different TCP connections, and wherein said presenting includes reassembling the files from the received sub-parts.

IPR2024-00918 Ex. 1001, '564 Patent Claim 9

2. The method of claim **1**, wherein said requesting the plurality of sequential ones of the files includes requesting sub-parts of the files over different ones of the plurality of TCP connections, and wherein said presenting includes reassembling the files from the received sub-parts.

IPR2024-00919 Ex. 1001, '772 Patent Claim 2

11. The method of claim **8**, wherein the at least one TCP connection comprises a plurality of different TCP connections, and wherein the automatically requesting includes requesting sub-parts of the files over different ones of the plurality of TCP connections, and wherein said presenting includes reassembling the files from the received sub-parts, and wherein the factor is indicative of the available bandwidth of the plurality of TCP connections.

IPR2024-00918 Ex. 1001, '564 Patent Claim 11

9. The method of claim **1**, wherein said automatically requesting includes requesting sub-parts of the files over different ones of the plurality of TCP connections, and wherein said presenting includes reassembling the files from the received sub-parts.

IPR2024-00919 Ex. 1001, '772 Patent Claim 9

'564, cls. 9, 11	'772, cls. 2, 9

Leaning Alone Or With Gamble Renders Obvious Requesting Sub-Parts Over Multiple TCP Connections

Gamble

[0050] FIG. 6 illustrates a flow diagram of a method **600** for receiving data from server **108** over N=4 parallel connections at client **106** (receiving system). This method can be performed by network application **112** operating on client **106**.

[0051] Initially, a receive buffer **706** is created to store N=4 READCHUNK segments from stream files 706_1 through 706_4, respectively, from server **108** on client **106** (step **602**). Receive buffer **706** can be configured in the same manner is send buffer **704**. Receive buffer **706** includes four sub-buffers B1 through B4 to store N=4 READCHUNK segments of data file **702**A that are streamed out of stream files 706_1 through 706_4, respectively. Received READCHUNK segments from server **108** are store in respective sub-buffers B1 through B4 based on the received connection (step **604**). For example, READCHUNK segment **1** in stream file 706_1 received on connection **1** is stored in sub-buffer B1 in receive buffer **706**.

IPR2024-00918, -00919 Ex. 1020 Gamble [0050-0051]

Gamble

[0037] TCP layer **312** uses sequence numbers for acknowledging and reordering the packets. As such, TCP layer **312** operating on client **106** can send acknowledgements of the packets. As described below, TCP layer **312** can send a set number of packets or window per connection on multiple or parallel connections to a destination application. IP layer **313** provides routing and forwarding functions so that a packet can reach its destination using an optimal path. This layer can use any number of routing tables to determine the nodes to send packets. Each packet can have an IP address for a destination computing system. Data link layers **314** provide services handling the actual transfer of the packets on a physical connection. The physical connection can be a wired or wireless connections using standard data link communication protocols.

IPR2024-00918, 00919 Ex. 1020 Gamble [0037]

IPR2024-00918 Pet. 58-59; IPR2024-00919 Pet. 59-60

'564, cls. 9, 11	'772, cls. 2, 9

Gamble Teaches Requesting Sub-Parts Over TCP Connections

Dr. Houh Declaration

transmitting a plurality of sequential files. Ex. 2141 ¶¶174-175. But, Gamble does not simply transmit files without a corresponding requests. Gamble expressly states that there is a "file management module 116 operating on server 108" that "can listen for TCP connection requests." Ex. 1020 [0038]. That server "can accept these connection requests and process all N per-connection data transfers independently and concurrently." Ex. 1020 [0039]. Where "N" refers to the number of parallel connections. Ex. 1020 [0039]. Further, Gamble discloses "file transfer techniques over parallel connections between applications such as network applications" wherein "a data file can be sent" from one client to another via a server, where each client can both send and receive data. Ex. 1020 [0042]. Accordingly, Gamble discloses "requesting" a plurality of files over multiple TCP connections.

Ex. 1026 Houh Suppl. Decl. ¶181

Gamble

[0038] In the example of **FIG. 3, a** plurality of connections or parallel connections can be established between applications at TCP layer **312**. This example shows N=5, wherein N can be an integer greater than one. TCP layer **312** establishes parallel TCP connections from client applications and/or to server applications. For example, file management module **116** operating on server **108** can listen for TCP connection requests on its well-known IP address and single well-known port number.

[0039] Moreover, to establish N parallel connections, a client application (e.g., network application **110**) selects N discrete unused port numbers on the client system. These client port numbers must be unique within the space of valid and unused port numbers on the client system. The actual values of the port numbers can be random. The client system can then initiate the standard TCP connection sequence for each of the N parallel connections. The server application, e.g., file management module **116**, can accept these connection requests and process all N per-connection data transfers independently and concurrently.

IPR2024-00918, 00919 Ex. 1020 Gamble [0038-0039]

IPR2024-00918 Pet. 58-59; IPR2024-00919 Reply 17

'564, cls. 9, 11	'772, cls. 2, 9

Gamble Teaches Requesting Sub-Parts Over TCP Connections

Gamble

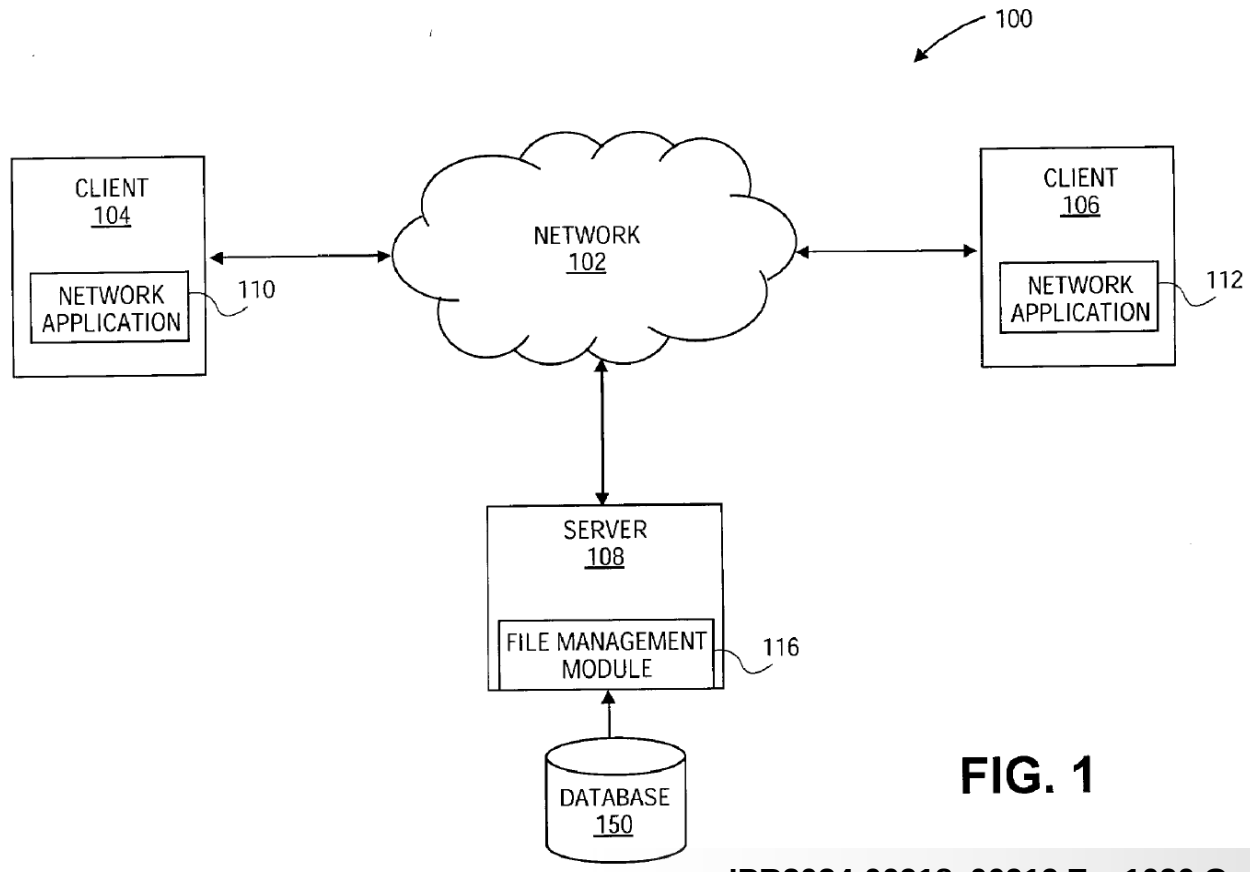


FIG. 1

IPR2024-00918, 00919 Ex. 1020 Gamble Fig. 1

'564, cls. 9, 11 | '772, cls. 2, 9

IPR2024-00918 POR 44; IPR2024-00919 POR 45

Leaning Alone Or With Gamble Renders Obvious Requesting Sub-Parts Over Multiple TCP Connections

Dr. Houh Declaration

182. At a minimum, a person of ordinary skill in the art would understand that a request would precede a transmission. TCP uses a request/response approach where a server (or computer system or client) calls to the internet module which then transmits the data to the desired destination. Ex. 1060 at 5-6, 10.

Ex. 1026 Houh Suppl. Decl. ¶182

'564, cls. 9, 11 | **'772**, cls. 2, 9

IPR2024-00918 Pet. 58-59; IPR2024-00919 Reply 17

PO's New POSR Motivation To Combine Argument Fails On The Merits

Petition

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 file data 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, ¶ 118. A POSITA would have had a reasonable expectation

IPR2024-00918 Pet. 59

'564, cls. 9, 11 | **'772**, cls. 2, 9

IPR2024-00918 Pet. 59; IPR2024-00919 Pet. 60-61

Claimed Factor Is Indicative Of Available Bandwidth Of The Plurality Of TCP Connections

11. The method of claim **8**, wherein the at least one TCP connection comprises a plurality of different TCP connections, and wherein the automatically requesting includes requesting sub-parts of the files over different ones of the plurality of TCP connections, and wherein said presenting includes reassembling the files from the received sub-parts, and wherein the factor is indicative of the available bandwidth of the plurality of TCP connections.

IPR2024-00918 Ex. 1001, '564 Patent Claim 11

Leaning

The initiation of a rate change is triggered:

a) if the buffer ever empties AND the measured rate is less than the current rate AND the measured Buffer Low Percentage exceeds a Step Down Threshold (as described below), reduce the current rate; (changing at a time when the buffer is already empty is advantageous as the sound card is not playing anything and it may be necessary to reconfigure it if the audio sampling rate, stereo–mono setting or bit width (number of bits per sample) has changed).

b) if the measured rate exceeds not only the current rate but also the next higher rate for a given period of time (e.g. 120 seconds: this could if desired be made adjustable by the user) increase the current rate

Ex. 1004 Leaning 8:17-26

'564, cl. 11

IPR2024-00918 Pet. 35

Agenda

1. The Challenged Patents ('156, '564, and '772 Patents)
2. Claim Construction
3. Leaning, Alone Or In Combination, Renders Challenged Claims Obvious
4. **Secondary Considerations Do Not Overcome Obviousness Case**

PO Has Not Shown Nexus



"The patentee bears the burden of showing that a nexus exists." *WMS Gaming Inc. v. Int'l Game Tech*., 184 F.3d 1339, 1359 (Fed. Cir. 1999). . . .

As first recognized in *Demaco Corp. v. F. Von Langsdorff Licensing Ltd.,* a patentee is entitled to a rebuttable presumption of nexus between the asserted evidence of secondary considerations and a patent claim if the patentee shows that the asserted evidence is tied to a specific product and that the product "***is*** the invention disclosed and claimed." 851 F.2d at 1392 (emphasis added). That is, presuming nexus is appropriate "when the patentee shows that the asserted objective evidence is tied to a specific product and that product 'embodies the claimed features, and is coextensive with them.'"

Fox Factory, Inc. v. SRAM, LLC, 944 F.3d 1366, 1373 (Fed. Cir. 2019) (last citation omitted)

IPR2024-00917 Reply 22, -00918 Reply 21, -00919 Reply 20

PO Improperly Incorporates Material By Reference

Patent Owner Response

74. MOVE's contemporaneous documents show that MOVE's Media-Player embodied, and was coextensive with, the Challenged Claims. *See* EX2141, ¶¶193-209; EX2022 (MOVE Networks Tech Overview); EX2021 (Streaming Media Technology); *see also* EX2071. To this end, PO provides DISH's and the ITC's analysis showing how MOVE's Media-Player and Sling TV embody MOVE's patented ABR technology, practices each limitation, and are coextensive with the challenged claims. EX2071 (Exemplary Claim Chart); *see also* EX1009 101-12 (ITC finding that Sling TV Apps practice claim 1 of the '564 Patent). Dr. Jeffay

IPR2024-00917 POR 51, -00918 POR 48-49, -00919 POR 50

§ 42.6 Filing of documents, including exhibits; service.

(a) ***General format requirements.***

* * *

(3) ***Incorporation by reference; combined documents.*** Arguments must not be incorporated by reference from one document into another document. Combined motions, oppositions, replies, or other combined documents are not permitted.

37 C.F.R. § 42.6(a)(3)

Parus chose to take on an affirmative burden to show that it was the first to make its claimed inventions. Once Parus chose to submit a response and assume that burden, it bore the responsibilities that came with it—including submitting a response that complied with the rules and regulations of the USPTO. And that includes not incorporating material by reference pursuant to 37 C.F.R. § 42.6(a)(3) and the inclusion of "a detailed explanation of the significance of the evidence including material facts" pursuant to 37 C.F.R. § 42.22.

***Parus Holdings, Inc. v. Google LLC*, 70 F.4th 1365, 1371 (Fed. Cir. 2023)**

IPR2024-00917 Reply 21, -00918 Reply 20-21, -00919 Reply 19-20

"Exemplary" Charts Only Address The MOVE Player And 3 Of 55 Claims

Patent Owner's "Exemplary" Charts

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").

IPR2024-00917 Ex. 2071 at 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 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").

IPR2024-00918 Ex. 2071 at 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").

IPR2024-00919 Ex. 2071 at 1

IPR2024-00917 (Patent No. 10,757,156)

- 18 challenged claims (1-18)
- Exemplary chart only addresses claim 13

IPR2024-00918 (Patent No. 9,407,564)

- 16 challenged claims (1-16)
- Exemplary chart only addresses claim 8

IPR2024-00919 (Patent No. 8,868,772)

- 21 challenged claims (1-21)
- Exemplary chart only addresses claim 1

IPR2024-00917 Reply 21, -00918 Reply 20-21, -00919 Reply 19-20

Ogdon IPR FWDs Recognized PO Improperly Incorporates Material By Reference

Patent Owner Response

74. MOVE's contemporaneous documents show that MOVE's Media-Player embodied, and was coextensive with, the Challenged Claims. *See* EX2141, ¶¶193-209; EX2022 (MOVE Networks Tech Overview); EX2021 (Streaming Media Technology); *see also* EX2071. To this end, PO provides DISH's and the ITC's analysis showing how MOVE's Media-Player and Sling TV embody MOVE's patented ABR technology, practices each limitation, and are coextensive with the challenged claims. EX2071 (Exemplary Claim Chart); *see also* EX1009 101-12 (ITC finding that Sling TV Apps practice claim 1 of the '564 Patent). Dr. Jeffay

IPR2024-00917 POR 51, -00918 POR 48-49, -00919 POR 50

Ogdon IPR Final Written Decision

[8] Patent Owner also makes tangential references to "Sling TV" in its arguments in favor of a presumption of nexus. *See* PO Resp. 52; PO Sur-reply 21. But Patent Owner never develops any basis for alleging such a presumption relative to Sling TV. At best, Patent Owner cites the Initial Determination of the ALJ in the ITC Investigation. *See* PO Resp. 52 (citing Ex. 1009, 112–13, 133, 151–52, 165–66). We decline to credit the ALJ's analysis in the absence of any developed argument in Patent Owner's papers relative to Sling TV. This also is the epitome of improper incorporation by reference. *See* 37 C.F.R. § 42.6(a)(3). Finally, we note that Patent Owner's evidence of secondary considerations is tied almost exclusively to the MOVE Media Player.

IPR2024-00146 FWD (Paper 57) 41 n.8

IPR2024-00917 Reply 21, -00918 Reply 20-21, -00919 Reply 19-20

PO Did Not Present "The Same Evidence" Before The ITC

Patent Owner Response

Specifically, the ITC relied on the same evidence presented below including Dr. Jeffay's claim charts to find that the evidence demonstrated nexus and that "*the*

IPR2024-00917 POR 50, -00918 POR 47, -00919 POR 49

ITC Decision

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 success of the Move system is due to the patented features of the invention. *WBIP*, 829 F.3d at

Ex. 1009 212

- Petitioners do **not** concede that MOVE Media Player meets every claim element

IPR2024-00917 Reply 20-21, -00918 Reply 20, -00919 Reply 19

Ogdon IPR FWDs Recognized ITC Record Was Different

Patent Owner Response

Specifically, the ITC relied on the same evidence presented below including Dr. Jeffay's claim charts to find that the evidence demonstrated nexus and that "*the*

IPR2024-00917 POR 50, -00918 POR 47, -00919 POR 49

Ogdon IPR Final Written Decision

[9] We note that the ITC's finding of a presumption of nexus was premised on the Respondents' concession about an invalidating public use of the MOVE Media Player in 2005. Ex. 1009, 212–13. In contrast, the instant record includes no such concession. On this record, we have no way of knowing what other similarities and differences exist between the records of the ITC Investigation and the instant case. Accordingly, we form our own opinion about the evidence presented in this case, as discussed below.

IPR2024-00043 FWD (Paper 59) 42 n.9

- Petitioners do **not** concede that MOVE Media Player meets every claim element

IPR2024-00917 Reply 20-21, -00918 Reply 20, -00919 Reply 19

PO Admits ITC Record Was Different

Patent Owner Response

Specifically, the ITC relied on the same evidence presented below including Dr. Jeffay's claim charts to find that the evidence demonstrated nexus and that "*the*

IPR2024-00917 POR 50, -00918 POR 47, -00919 POR 49

Patent Owner Sur-Reply

Evidence Petitioners Allege was Before ITC But "not in this proceeding" (Reply, 20)	Corresponding Exhibit Number in This Proceeding
* * *	
RX-0001C (Respondents' Witness Statement)	Statement Concerns Confidential Infringement, Not Validity.

IPR2024-00917, -00918 POSR 22-23, -00919 POSR 23

- PO did **not** produce the same technical documents as in the ITC—it also withheld the deposition exhibits from the selected ITC deposition transcripts it provided

IPR2024-00917 Reply 20-21, -00918 Reply 20, -00919 Reply 19

ITC Decision Relies On Respondents' Concessions That Claim Elements Are Met

ITC Decision

a) (1pre) An end user station for adaptive-rate content streaming of digital content from a video server over a network, the end user station comprising:

Use of the DISH Set-Top Boxes and the Sling Fire App meets this limitation. *See* CX-0010C (Negus DWS) Q/A 679-83. Respondents do not contest that use of the DISH Set-Top Boxes and the Sling Fire App satisfy this limitation. *See* Resps. Br. at 99-108. To the extent the preamble of claim 1 is limiting, I find that use of the DISH Set-Top Boxes and the Sling Fire App satisfies the preamble.

Ex. 1009 102

Dr. Jeffay's Testimony



Dr. Jeffay

DISH/PO's Expert

Q Okay. Thank you. Well, let's - - see let's look at ITC's decision. If you could look at page 102, this is related to claim 1 of the '564 patent.

A Okay.

Q You see in the subsection a is the first limitation. And he calls it - - the ALJ refers to it in parentheses as 1pre.

A I see that.

Q In that section the ALJ says, Respondents do not contest that use of the DISH set-top boxes and the Sling Fire App satisfy this limitation. Do you see that there?

A Yes.

Q So the ALJ noted that this limitation was not contested, correct?

A I think that's a fair read of that.

Ex. 1027 Jeffay Tr. 182:11-183:7

IPR2024-00917 Reply 25-26, -00918 Reply 25-26, -00919 Reply 24-25 (all citing Ex. 1026 Houh Suppl. Decl. ¶195)

ITC Decision Relies On Respondents' Concessions That Claim Elements Are Met

ITC Decision

a) (1pre) An end user station for adaptive-rate content streaming of digital content from a video server over a network, the end user station comprising:

b) (1a) a media player operating on the end user station configured to stream a video from the video server via at least one transmission control protocol (TCP) connection over the network,

d) (1c) wherein each of the files yields a different portion of the video on playback,

e) (1d) wherein the files across the different copies yield the same portions of the video on playback, and

g) (1f) wherein the media player streams the video by: requesting a plurality of sequential files of one of the copies from the video server based on the time indexes;

i) (1h) the automatically requesting including repeatedly generating a factor indicative of the current ability to sustain the streaming of the video using the files from different ones of the copies, wherein the set of one or more factors relate to the performance of the network;

Use of the DISH Set-Top Boxes and the Sling Fire App meets this limitation. *See* CX-0010C (Negus DWS) Q/A 719-32. Respondents do not contest that use of the DISH Set-Top Boxes and the Sling Fire App satisfies this limitation. *See* Resps. Br. at 99-108.

Ex. 1009 102-07

Dr. Jeffay's Testimony



Dr. Jeffay

DISH/PO's Expert

Q And there were six different concessions in this one claim?

* * *

A Yeah. I - - in any event, I think we established - - or - - or I trusted you had counted correctly to 6.

Ex. 1027 Jeffay Tr. 190:20-191:18

IPR2024-00917 Reply 25-26, -00918 Reply 25-26, -00919 Reply 24-25 (all citing Ex. 1026 Houh Suppl. Decl. ¶195)

PO Incorrectly States ITC Decision Found All Sling TV Apps Practice An Exemplary Claim

Patent Owner Response

74. MOVE's contemporaneous documents show that MOVE's Media-Player embodied, and was coextensive with, the Challenged Claims. *See* EX2141, ¶¶193-209; EX2022 (MOVE Networks Tech Overview); EX2021 (Streaming Media Technology); *see also* EX2071. To this end, PO provides DISH's and the ITC's analysis showing how MOVE's Media-Player and Sling TV embody MOVE's patented ABR technology, practices each limitation, and are coextensive with the challenged claims. EX2071 (Exemplary Claim Chart); *see also* EX1009 101-12 (ITC finding that Sling TV Apps practice claim 1 of the '564 Patent). Dr. Jeffay

IPR2024-00917 POR 51, -00918 POR 48-49, -00919 POR 50

ITC Decision

(collectively, the "DISH Set-Top Boxes"). Compls. Br. at 117. For streaming apps, DISH contends that its Sling TV Application for Amazon Fire ("Sling Fire App") is representative of the Sling TV Apps for iOS and Roku (collectively, the "Sling TV Apps"). *See id.* at 120.

Ex. 1009 76

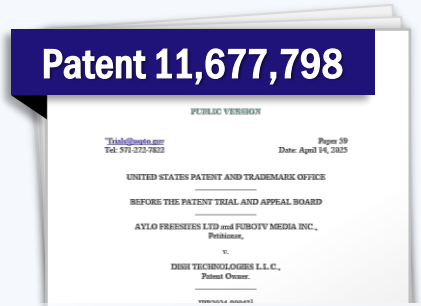
representative of all DISH Set-Top Boxes after December 2017. *See supra* Sec. VIII.A. I also found, however, that DISH has not established that the Sling Fire App is representative of the Sling TV Apps. *See supra* Sec. VIII.B. The Staff argues that DISH has not established that the DISH

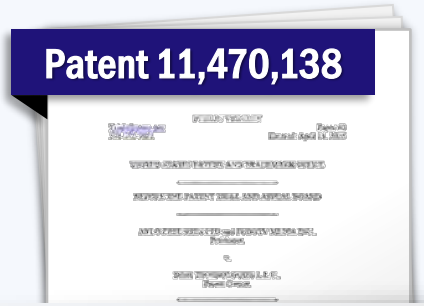
Ex. 1009 101

- ITC Decision identified **three** Sling TV Apps
- ITC found PO did **not** establish one was representative

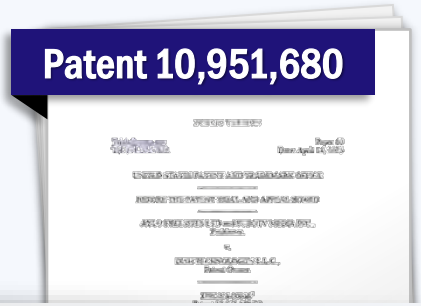
IPR2024-00917 Reply 25-26, -00918 Reply 25-26, -00919 Reply 24-25 (all citing Ex. 1026 Houh Suppl. Decl. ¶195)

Critical Unclaimed Features Establish Lack Of Nexus







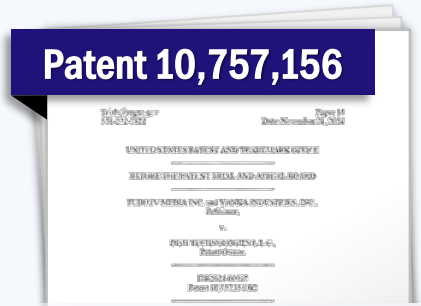


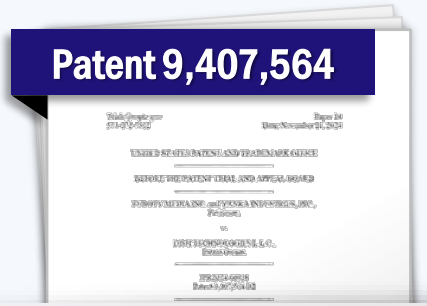


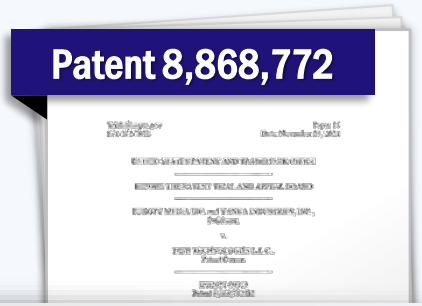
PO argues products coextensive with:

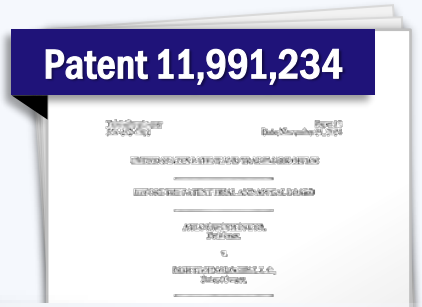
22 claims | 25 claims | 25 claims | 24 claims | 23 claims

IPR2024-00043 | IPR2024-00044 | IPR2024-00045 | IPR2024-00046 | IPR2024-00146









PO argues products coextensive with:

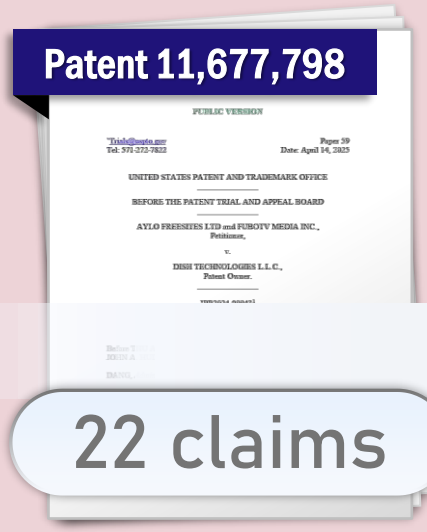
18 claims | 16 claims | 21 claims | 9 claims

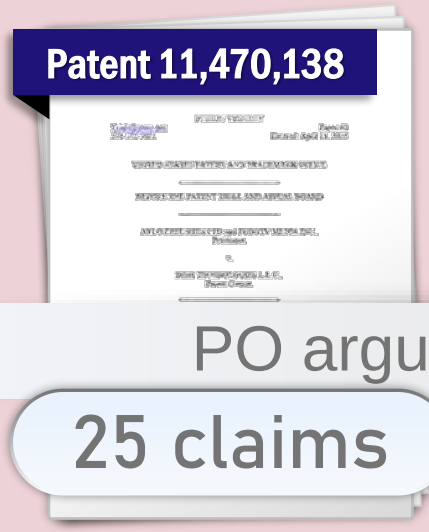
IPR2024-00917 | IPR2024-00918 | IPR2024-00919 | IPR2024-00940

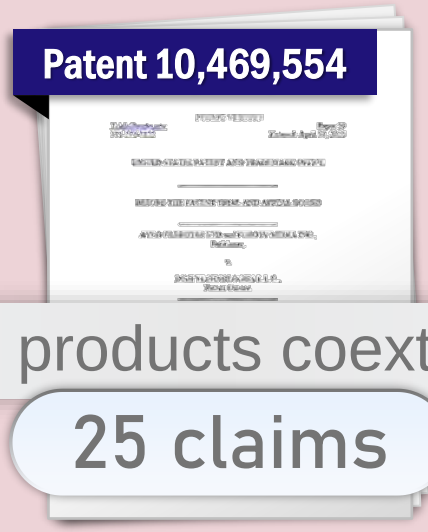
PO asserts nexus to more than 180 claims

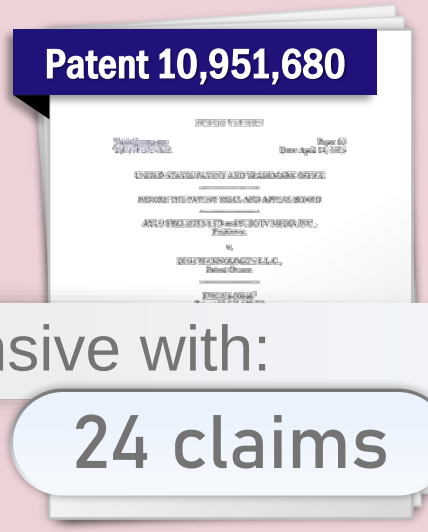
IPR2024-00917 Reply 22, -00918 Reply 22, -00919 Reply 21

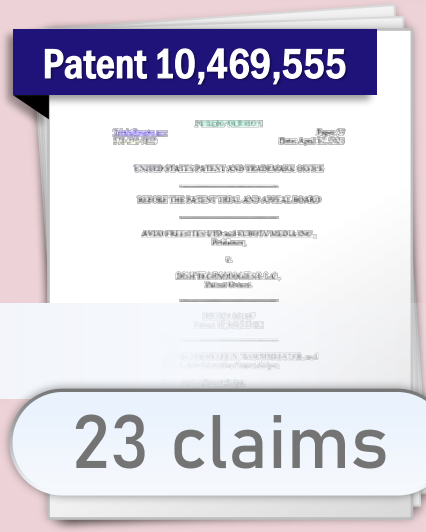
Critical Unclaimed Features Establish Lack Of Nexus





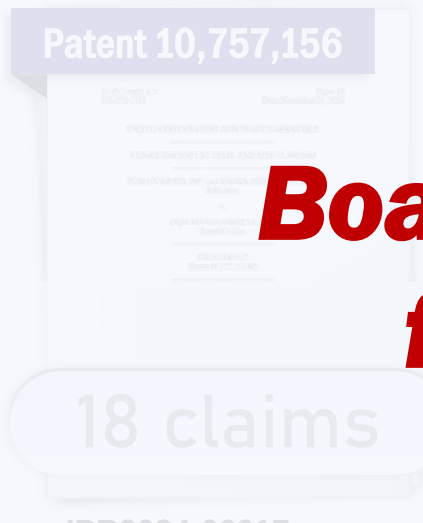


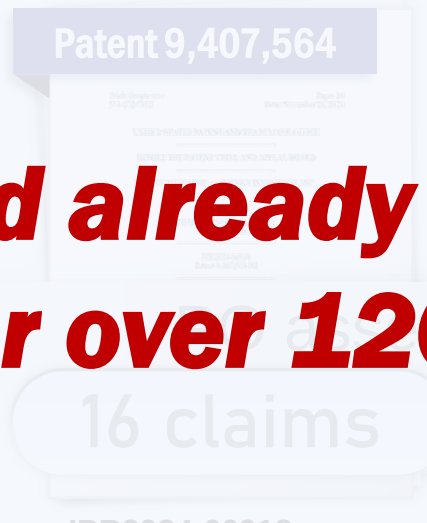




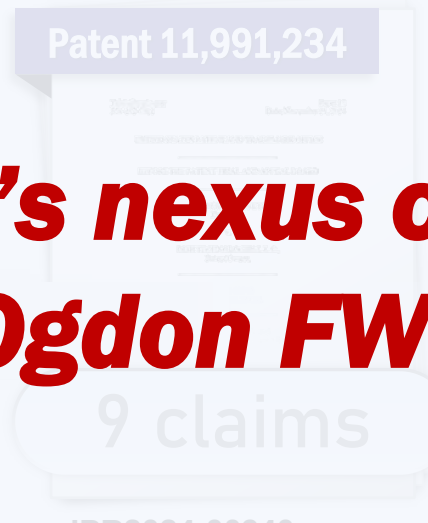
PO argues products coextensive with:

22 claims	25 claims	25 claims	24 claims	23 claims
IPR2024-00043	IPR2024-00044	IPR2024-00045	IPR2024-00046	IPR2024-00146









Board already rejected PO's nexus claims for over 120 claims in Ogdon FWDs

PO asserts nexus to more than 180 claims

18 claims	16 claims	21 claims	9 claims
IPR2024-00917	IPR2024-00918	IPR2024-00919	IPR2024-00940

IPR2024-00917 Reply 22, -00918 Reply 22, -00919 Reply 21

PO Previously Asserted Nexus To A Different Feature

Patent Owner Response

Even without a presumption of nexus, PO's voluminous evidence demonstrates that the objective indicia are the "direct result of the unique characteristics of the claimed invention." *Fox Factory*, 944 F.3d at 1373-74; EX1009, 212; EX2021; EX2141, ¶¶210-217. Critically, the evidence demonstrates that the success of MOVE's Media-Player is directly tied to the claimed unique combination including the "continuous playback" feature. Industry participants

IPR2024-00917 POR 52, -00918 POR 49-50, -00919 POR 51

Ogdon IPR Final Written Decision

Patent Owner argues that certain evidence of praise is tied to "the expressly claimed features, such as 'actively adjusting . . . video quality to the bandwidth available' and delivering 'pieces of content progressively.'" *Id.* at 54 (citing Ex. 2023).

IPR2024-00043 FWD (Paper 59) 47

IPR2024-00917 Reply 22-23, -00918 Reply 22-23, -00919 Reply 21-22

PO Asserts Nexus Now Tied To "Continuous Playback" Feature

Patent Owner Response

Even without a presumption of nexus, PO's voluminous evidence demonstrates that the objective indicia are the "direct result of the unique characteristics of the claimed invention." *Fox Factory*, 944 F.3d at 1373-74; EX1009, 212; EX2021; EX2141, ¶¶210-217. Critically, the evidence demonstrates that the success of MOVE's Media-Player is directly tied to the claimed unique combination including the "continuous playback" feature. Industry participants

IPR2024-00917 POR 52, -00918 POR 49-50, -00919 POR 51

PO's Expert, Dr. Jeffay (Current IPRs)

206. For example, the Move Networks Simulcoding process described above, which is responsible for preparing the different bitrate/quality streams and streamlets, "produce[s] several benefits for the video customer, including the following: 1. Quality of service benefits for continuous playback—no noticeable buffering; 2. Quality of service optimization, based on hardware profiles and the speed and quality of the connection to the Internet; 3. The ability to modify the video timeline, such as replacing a program, inserting a commercial, or switching between live and prerecorded programming; and 4. Encoding process enables scalable delivery infrastructure." EX2022 at 11. And "the small video streamlets" are what "allow for the rich functionality available in delivery and viewing of the video. These streamlets enable the Move Networks system to operate efficiently and effectively." *Id.* In an elegant solution, by aligning the streamlets, Move's solution allowed for seamless retrieval of content while changing bitrates during a session so that the video could continue even though the network bandwidth was inconsistent and not stable. And even though the playout of the video may decrease in quality (in ways that may or may not be discernable to the viewer), the delivery and hence the playout was continuous, and viewers accepted this tradeoff. *See infra* §IX.C; *see also* EX2036, 2 ("more than 50 minutes"); EX2035, 1 ("more than 50 minutes"); *see also* EX2034 ("22 minutes a session, compared with 3 or 4 minutes" previously); EX2048 ("It also means people watch longer."). This aspect of the inventions is fundamentally different from the prior art in which viewers suffered from discontinuous playback, constant buffering, packet losses, and latency. *Cf.* EX2077. Thus, the inventions of the ABR Patents do not suffer from the same limitations to functionality and performance of prior systems plagued by common streaming solutions at that time.

Ex. 2141 Jeffay Decl. ¶206

(breaks added)

IPR2024-00917 Reply 22-23, -00918 Reply 22-23, -00919 Reply 21-22

Both Features Result From Same Adaptive Bitrate Technology

PO's Expert, Dr. Jeffay (Ogdon IPRs)

187. For example, the Move Networks Simulcoding process described above, which is responsible for preparing the different bitrate/quality streams and streamlets, "produce[s] several benefits for the video customer, including the following: 1. Quality of service benefits for continuous playback—no noticeable buffering; 2. Quality of service optimization, based on hardware profiles and the speed and quality of the connection to the Internet; 3. The ability to modify the video timeline, such as replacing a program, inserting a commercial, or switching between live and prerecorded programming; and 4. Encoding process enables scalable delivery infrastructure." **EX2012** at 11. And "the small video streamlets" are what "allow for the rich functionality available in delivery and viewing of the video. These streamlets enable the Move Networks system to operate efficiently and effectively." **EX2012 at 11**. In an elegant solution, by aligning the streamlets, **it** allowed for seamless retrieval of content while changing bitrates during a session so that the video could continue even though the network bandwidth was inconsistent and not stable. And even though the playout of the video may decrease in quality (in ways that may or may not be discernable to the viewer), the delivery and hence the playout was continuous, and viewers accepted this tradeoff.

This aspect of the inventions is fundamentally different from the prior art in which **the server decided which files to send to the client and/or when to send files to the client.** Thus, the inventions of the ABR Patents do not suffer from the same **server-based** limitations to functionality and performance of prior systems.

IPR2024-00043 Ex. 2006 ¶187

PO's Expert, Dr. Jeffay (Current IPRs)

206. For example, the Move Networks Simulcoding process described above, which is responsible for preparing the different bitrate/quality streams and streamlets, "produce[s] several benefits for the video customer, including the following: 1. Quality of service benefits for continuous playback—no noticeable buffering; 2. Quality of service optimization, based on hardware profiles and the speed and quality of the connection to the Internet; 3. The ability to modify the video timeline, such as replacing a program, inserting a commercial, or switching between live and prerecorded programming; and 4. Encoding process enables scalable delivery infrastructure." **EX2022** at 11. And "the small video streamlets" are what "allow for the rich functionality available in delivery and viewing of the video. These streamlets enable the Move Networks system to operate efficiently and effectively." ***Id***. In an elegant solution, by aligning the streamlets, **Move's solution** allowed for seamless retrieval of content while changing bitrates during a session so that the video could continue even though the network bandwidth was inconsistent and not stable. And even though the playout of the video may decrease in quality (in ways that may or may not be discernable to the viewer), the delivery and hence the playout was continuous, and viewers accepted this tradeoff. ***See infra* §IX.C; *see also* EX2036, 2 ("more than 50 minutes"); EX2035, 1 ("more than 50 minutes"); *see also* EX2034 ("22 minutes a session, compared with 3 or 4 minutes" previously); EX2048 ("It also means people watch longer.").** This aspect of the inventions is fundamentally different from the prior art in which **viewers suffered from discontinuous playback, constant buffering, packet losses, and latency. *Cf.* EX2077.** Thus, the inventions of the ABR Patents do not suffer from the same limitations to functionality and performance of prior systems **plagued by common streaming solutions at that time**.

Ex. 2141 Jeffay Decl. ¶206

(Differences **underlined**, breaks added to align text)

IPR2024-00917 Reply 22-23, -00918 Reply 22-23, -00919 Reply 21-22 (all citing Ex. 1026 Houh Suppl. Decl. §XVII.A.5 (¶207))

Both Features Result From Adaptive Bitrate Technology Known In The Prior Art

Patent Owner Response

Moreover, as Dr. Jeffay further explains, the secondary considerations evidence is the direct result of the unique characteristics of the claimed invention in MOVE's Media-Player that led to high-quality video delivery, fast start-up times, less buffering, continuous playback, and "a dramatically improved viewing experience for high-end and low-end connections" because it used ABR technology disclosed in the Challenged Patent. EX2141, ¶¶190, 213, 215, 265. With these features, MOVE's Media-Player offered "a ***smooth end user experience*** as the Move Media-Player up-shift[ed] and down-shift[ed] in response to network and client CPU availability" to achieve continuous playback. EX2141, ¶¶194, 196, 201.

IPR2024-00917 POR 53-54, -00918 POR 50-51, -00919 POR 52

Ogdon IPR Final Written Decision

We agree with Petitioner that "actively adjusting . . . video quality to the bandwidth available" and "delivering 'pieces of content progressively'" were taught by the prior art, namely, Ogdon and Leaning. *See* Ex. 1004, 3:38–41 (Ogdon teaching "dynamically and adaptively switch[ing] between . . . versions of the presentation according to network transmission characteristics"), 22:10–23 (Ogdon teaching a client node that "select[s] an appropriate content webserver and an appropriate version of the next collection of segments to be retrieved" when the next collection of segments is not cached); Ex. 1024, code (57) (Leaning teaching "switching between alternative sub-file sets representing alternative delivery modes of data rates"), 1:12–19 (Leaning teaching "control means responsive to the state of the buffer to generate request messages for further files for replenishment of the buffer"); *see also* Ex. 1028 ¶¶ 78–81 (Dr. Houh's testimony regarding Ogdon and Leaning). Nexus cannot be predicated on aspects of the technology that are already in the prior art. *See Kao*, 639 F.3d at 1069. Thus, Patent Owner's attempt to establish a direct nexus based on these alleged "unique characteristics" is fatally flawed, and we accord these arguments little or no weight.

IPR2024-00043 FWD (Paper 59) 48-49

IPR2024-00917 Reply 22-23, -00918 Reply 22-23, -00919 Reply 21-22

Both Features Result From Adaptive Bitrate Technology Known In The Prior Art

Patent Owner Sur-Reply

Petitioners adopt a fallback argument that the initial commercial embodiment of the claimed invention—the MOVE player—sometimes exhibited playback stalls in extreme circumstances. Reply, 3. While there is no evidence customers experienced stalls, this is irrelevant even if it were true. The claims do not require eliminating *all* interruptions under *every* conceivable scenario. Rather, they require a method of playback that automatically adjusts in response to network performance to *avoid* playback interruption. If that sometimes succeeds, the apparatus that achieves the continuous playback in the claim is within the scope of the claims. *Cf.*

IPR2024-00917, -00918, -00919 POSR 7

Ogdon IPR Final Written Decision

We agree with Petitioner that "actively adjusting . . . video quality to the bandwidth available" and "delivering 'pieces of content progressively'" were taught by the prior art, namely, Ogdon and Leaning. *See* Ex. 1004, 3:38–41 (Ogdon teaching "dynamically and adaptively switch[ing] between . . . versions of the presentation according to network transmission characteristics"), 22:10–23 (Ogdon teaching a client node that "select[s] an appropriate content webserver and an appropriate version of the next collection of segments to be retrieved" when the next collection of segments is not cached); Ex. 1024, code (57) (Leaning teaching "switching between alternative sub-file sets representing alternative delivery modes of data rates"), 1:12–19 (Leaning teaching "control means responsive to the state of the buffer to generate request messages for further files for replenishment of the buffer"); *see also* Ex. 1028 ¶¶ 78–81 (Dr. Houh's testimony regarding Ogdon and Leaning). Nexus cannot be predicated on aspects of the technology that are already in the prior art. *See Kao*, 639 F.3d at 1069. Thus, Patent Owner's attempt to establish a direct nexus based on these alleged "unique characteristics" is fatally flawed, and we accord these arguments little or no weight.

IPR2024-00043 FWD (Paper 59) 48-49

IPR2024-00917 Reply 22-23, -00918 Reply 22-23, -00919 Reply 21-22

PO's Marketing Materials Show MOVE Player Had Interrupted Playback

Patent Owner Sur-Reply

Petitioners adopt a fallback argument that the initial commercial embodiment of the claimed invention—the MOVE player—sometimes exhibited playback stalls in extreme circumstances. Reply, 3. While there is no evidence customers experienced stalls, this is irrelevant even if it were true. The claims do not require eliminating *all* interruptions under *every* conceivable scenario. Rather, they require a method of playback that automatically adjusts in response to network performance to *avoid* playback interruption. If that sometimes succeeds, the apparatus that achieves the continuous playback in the claim is within the scope of the claims. *Cf.*

IPR2024-00917, -00918, -00919 POSR 7

The following is a list of the data types collected and provided within the log files and a brief description of each element, **which are available in customized report forms and analysis:**

- **stallCount** – a stall is basically when any kind of a blip occurs during play
- **mindur** – minimum duration of all the stalls users experienced (in ms)
- **avgdur** – average duration of all the stalls users experienced
- **maxdur** – maximum duration of all the stalls users experienced
- **enddurstall** – 1 if the user exited the browser during a stall; 0 if not
- **seekcount** – number of times a user used the seek function
- **mindelay** – minimum duration for the content to resume playing after a stall (in ms)
- **avgdelay** – average duration for the content to resume playing after a stall
- **maxdelay** – max duration for the content to resume playing after a stall
- **enddurseek** – if the user exited the browser during a seek
- **viewedall** – if the user viewed the entire piece of content
- **startdelay** – duration (in ms) after player loaded that content started playing

Ex. 2022 29

See IPR2024-00917 Reply 21, -00918 Reply 21, -00919 Reply 20

PO's Marketing Materials Show MOVE Player Had Interrupted Playback

Dr. Houh Supplemental Declaration

199. For each claim in each example chart, Dr. Jeffay cites MOVE Networks' marketing materials, specifically Ex. 2022, to support his assertion that the MOVE Media Player provided "continuous" playback. . . . But the cited marketing material establishes that the MOVE Media Player had "stalls" and "blips" in playback and collected detailed data regarding those stalls. Ex. 2022 at 29. . . . That the MOVE Media Player "collected and provided" this data "within [its] log files" indicates that discontinuities in playback were known to occur when using the player.

Ex. 1026 Houh Suppl. Decl. ¶199

The following is a list of the data types collected and provided within the log files and a brief description of each element, **which are available in customized report forms and analysis:**

- **stallCount** – a stall is basically when any kind of a blip occurs during play
- **mindur** – minimum duration of all the stalls users experienced (in ms)
- **avgdur** – average duration of all the stalls users experienced
- **maxdur** – maximum duration of all the stalls users experienced
- **enddurstall** – 1 if the user exited the browser during a stall; 0 if not
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Ex. 2022 29

See IPR2024-00917 Reply 21, -00918 Reply 21, -00919 Reply 20 (all citing Ex. 1026 Houh Suppl. Decl. §XVII.A.3 (¶199))

PO's Declarants Confirmed MOVE Player Had Interrupted Playback

Dr. Jeffay's Testimony



Dr. Jeffay

DISH/PO's Expert

Q You said you could imagine what might be a blip. What might be a blip?

A A -- a blip could be something that causes the video to freeze.

* * *

Q And sitting here today, you can't think of anything else that would be a blip?

A No.

Ex. 1027 Jeffay Tr. 213:18-21, 219:10-12

David Ericson's Testimony



David Ericson

Former MOVE Employee

Q What does "stalls" mean in the context of video streaming?

* * *

A A stall would be somewhat analogous to what I said was freezing before. It's basically from a user perspective the video stalls. It was playing and now it's frozen or it's stalled.

* * *

Q What does "blip" mean in the context of video streaming?

A I would categorize it as a brief freeze or stall.

* * *

Q Is the term "blip" fairly well known in the video streaming industry?

A Yes. Lots of people have lots of terms for these. We were inventing our own terms at the time -- right. I don't know what to say. When we invented the technology, no one had terms for any of this stuff. So we called it what we called it and people tried to describe the behavior they saw. So no doubt there is lots of terms. Blip is a term I have heard.

Ex. 1030 Ericson Tr. 211:18-213:21

IPR2024-00917 Reply 21, -00918 Reply 21, -00919 Reply 20

PO's Declarants Confirmed MOVE Player Had Interrupted Playback

Drew Major's Testimony



Drew Major

Named Inventor

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

* * *

A 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. . . .

* * *

Q So in terms of buffering and stalling delays, you were doing it better, but you hadn't completely eliminated it; is that fair?

A Yeah. There's nothing in networking today that is perfect.

Ex. 1032 Major Tr. 127:6-128:8

Mark Mitchell's Testimony



Mark Mitchell

Former MOVE Employee

Q It's not your position that the MOVE Network's viewer would never buffer -- never have buffering?

* * *

A No video player never buffers, so...

Q So you would agree that the MOVE Network's Viewer could sometimes buffer?

A Yes. In the right conditions.

Ex. 1034 Mitchell Tr. 54:7-16

IPR2024-00917 Reply 21, -00918 Reply 21, -00919 Reply 20

Unclaimed Features Account For Alleged Secondary Considerations

Patent Owner Response

"***The key***," one article writes, "***is in [MOVE's] plug-in***…Because it puts the end-user environment in control, it can determine the best end-user experience ***intelligently…ensur[ing] fluidity of playback***." *Id.* EX2141, ¶216.

IPR2024-00917 POR 53, -00918 POR 50, -00919 POR 51-52

PO's Expert, Dr. Jeffay

EX2048. "***The key***," one article writes, "***is in [MOVE's] plug-in***…Because it puts the end-user environment in control, it can determine the best end-user experience ***intelligently…ensur[ing] fluidity of playback***."

Ex. 2141 Jeffay Decl. ¶216

IPR2024-00917 Reply 23-24, -00918 Reply 23, -00919 Reply 22

Move Networks and the Quality Solution

So earlier this week, I spoke with Move's VP of marketing Jim Ericson to get a better technical understanding of how they deliver this high quality video for some of the largest media companies in the world.

The basic technology involved is what they call *simulcoding* which takes a feed and simultaneously encodes it into smaller pieces called "streamlets" using multiple profiles to offer playback at multiple bitrates.

* * *

But the key is in the plugin, which manages delivery, assembles and renders the stream, and offers DRM, geo-targeting, and extremely in-depth reporting. Because it puts the end-user environment in control, it can determine the best end-user experience intelligently.

And this is where the quality comes in. Move's adaptive protocol means that the plugin can determine the best encoding profile for a user based on available bandwidth.

Because multiple profiles are encoded simultaneously the plugin switches between them midstream based on changes in bandwidth. This ensures fluidity of playback and makes it possible for example, to see HD when the capacity is there but lower quality video when someone else taps into your shared wireless connection.

* * *

The final element in Move's technology is reporting, and again this is where having a client-side plugin is a tremendous advantage. Everything viewed in a Move Networks player is tracked.

Ex. 2048 1

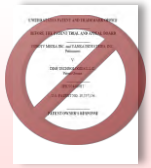
PO's New POSR Argument That Nexus Is Tied To "Multiple TCP Connections" and "HTTP Requests" Fails On The Merits

Improper New POSR Argument

Patent Owner Sur-Reply

not apply to these claims. Reply, 20-21. In *Ogdon*, the Board found no nexus because the claims lacked certain allegedly "critical" but "unclaimed features"—specifically, "multiple TCP connections" and "HTTP requests." IPR2024-00043, Paper 59, 41-59. Claim 2 (via its dependency from Claim 1) expressly recites both of those features. The only rationale for denying nexus in *Ogdon* is therefore inapplicable to at least that claim. Regardless, the ITC's finding of a presumption of nexus for the '156 Patent should apply to *all* of the Challenged Claims here.

IPR2024-00917 POSR 23-24; *see also* -00918, -00919 POSR 24



PO did not argue nexus tied to "multiple TCP connections" or "HTTP requests" in POR

Ogdon IPR Final Written Decision

Nexus denied for multiple reasons, including:

1. Improper incorporation by reference
   IPR2024-00146 FWD (Paper 57) 40-41 n.7, 8
2. PO tied nexus to adaptive bitrate streaming, which was known in the prior art
   IPR2024-00043 FWD (Paper 59) 48-49, 51
3. Any commercial success tied to MOVE entity or known adaptive bitrate streaming
   IPR2024-00043 FWD (Paper 59) 54
4. PO failed to show any licenses tied to the claimed invention
   IPR2024-00043 FWD (Paper 59) 54

***See* IPR2024-00917 Reply 20-25, -00918 Reply 20-25, -00919 Reply 19-24**

PO's Long-Felt Need Evidence Is Tied To Known Adaptive Bitrate (ABR) Technology

Patent Owner Response

The patented ABR technology achieved success where others failed. EX2141, ¶¶218-229; *see also* EX2020, ¶¶6-28, 13; EX2099 ¶¶8-12. The claimed invention achieved continuous playback of streaming video when others could not. *See Apple*, 839 F.3d at 1053 ("it is reasonable to infer the need would not have persisted had the solution been obvious."). In this regard, "longfelt need is closely related to the failure of others." *In re Cyclobenzaprine Hydrochloride Extended-Release Capsule Patent Litig.*, 676 F.3d 1063, 1082-83 (Fed. Cir. 2012).

IPR2024-00917 POR 55-56, -00918 POR 52-53, -00919 POR 54-55

Ogdon IPR Final Written Decision

Nevertheless, even if Patent Owner had defined the alleged long-felt need as a need for improved long-duration, high-definition video over the internet—it did not—we would still find that Patent Owner's evidence tied to the MOVE Media Player lacks a nexus to the claimed invention for the reasons mentioned above. *See* above section II(C)(6)(a)(vi)(1). Specifically, Patent Owner's arguments keyed to the "patented ABR [adaptive bitrate] technology" (PO Resp. 54–59) are not sufficient to establish a nexus to the challenged claims. *See* above section II(C)(6)(a)(vi)(1). In addition, adaptive bitrate streaming was already known in the art. *See id.*

IPR2024-00043 FWD (Paper 59) 51

IPR2024-00917 Reply 24, -00918 Reply 24, -00919 Reply 23

PO's Surprising Results Are Merely Differences in Degree, Not Kind

Drew Major's Testimony



Drew Major

Named Inventor

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

* * *

A 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. . . .

* * *

Q So in terms of buffering and stalling delays, you were doing it better, but you hadn't completely eliminated it; is that fair?

A Yeah. There's nothing in networking today that is perfect.

Ex. 1032 Major Tr. 127:6-128:8

Ogdon IPR Final Written Decision

"Unexpected results that are probative of nonobviousness are those that are 'different in kind and not merely in degree from the results of the prior art.'" *Galderma Lab'ys, L.P. v. Tolmar, Inc.*, 737 F.3d 731, 739 (Fed. Cir. 2013) (quoting *Iron Grip Barbell Co. v. USA Sports, Inc.*, 392 F.3d 1317, 1322 (Fed. Cir. 2004)). Although Patent Owner puts forth some evidence of users' surprise at the higher quality of the MOVE Media Player's streaming video, the record does not establish that MOVE's streaming video results were of a different and unexpected kind consistent with the holding of *Iron Grip*. The results were still streaming video, as had already existed, albeit at a better quality or degree according to Patent Owner's telling. Further, Patent Owner's evidence suffers from a lack of nexus to the claimed invention, as discussed above. *See* above section II(C)(6)(a)(vi)(1). For these reasons, we accord Patent Owner's evidence of unexpected results little to no weight.

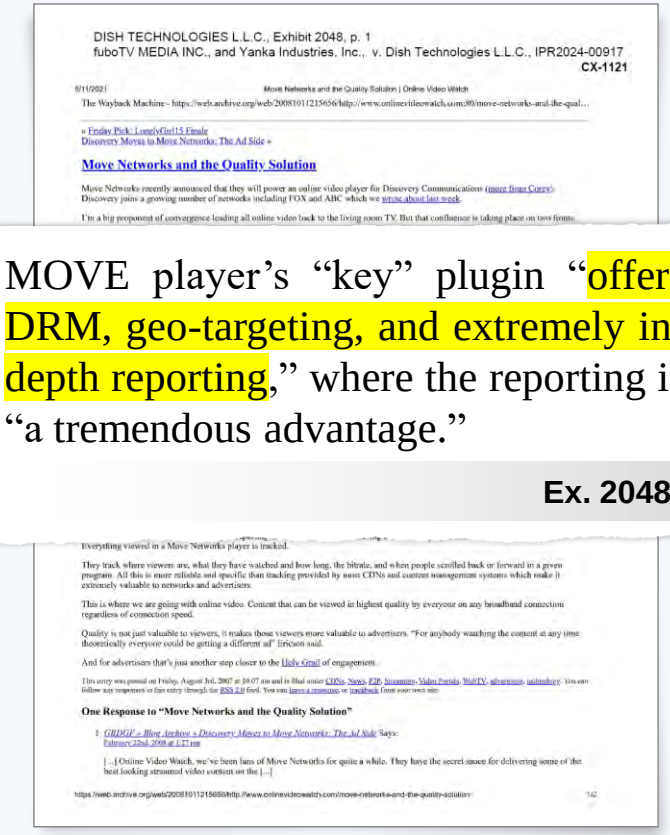
IPR2024-00043 FWD (Paper 59) 52

IPR2024-00917 Reply 24, -00918 Reply 24, -00919 Reply 23

PO's Commercial Success Evidence Lacks Nexus

PO's Commercial Success Evidence is not tied to novel aspects of the challenged claims, rather it is tied to:

Critical, Unclaimed Features


DISH TECHNOLOGIES L.L.C., Exhibit 2048, p. 1
fuboTV MEDIA INC., and Yanka Industries, Inc., v. Dish Technologies L.L.C., IPR2024-00917
CX-1121

Move Networks and the Quality Solution

MOVE player's "key" plugin "offers DRM, geo-targeting, and extremely in-depth reporting," where the reporting is "a tremendous advantage."

Ex. 2048 1

MOVE Networks the company or known ABR technology

Ogdon IPR Final Written Decision

Further, to the extent that Patent Owner's evidence of commercial success is tied to MOVE Networks as an entity, or to MOVE's "technology" or "ABR [adaptive bitrate] technology" generally (*see, e.g., id.* ¶¶ 206–210, 212–213, 215–216, 219, 225), it is not sufficiently tied to the claimed invention of the '798 patent to merit significant weight. *See* above section II(C)(6)(a)(vi)(1).

We also have considered Patent Owner's evidence of licenses for its adaptive bitrate patents. *See* Ex. 2053, 23 n.100; Exs. 2083–2085. We agree with Petitioner (Pet. Reply 25) that licensing evidence is entitled to little weight as an indicator of commercial success where, as here, Patent Owner has not demonstrated a nexus between the invention of the '798 patent and these licenses. *See Iron Grip*, 392 F.3d at 1324 (holding that "the existence of licenses is of little significance" in the absence of nexus evidence).

IPR2024-00043 FWD (Paper 59) 54

IPR2024-00917 Reply 24-25, -00918 Reply 24-25, -00919 Reply 23-24

PO's Evidence Does Not Show Copying

Patent Owner Response

The objective evidence suggests that competitors adopted MOVE's patented ABR technology. *See generally* EX2141, ¶¶264-269. . . . MOVE disclosed its ABR technology to Apple in 2006 under multiple NDAs. EX2141, ¶¶266-267; EX2065; EX2066. Although Apple declined to enter a business relationship with MOVE, it subsequently embraced adaptive bitrate streaming and developed the HLS Standard, which the ITC found is "very similar to what MOVE had developed and was using as a proposed standard." EX2073, 38:20-40:7 EX2100 ¶¶20-27; EX2102, 113:5-9, 138:13-18; 155:1-15; 156:6-15; EX2046.

IPR2024-00917 POR 67, -00918 POR 63, -00919 POR 66

ITC Decision

I find that DISH has not adduced sufficient evidence showing "the replication of a specific product." *Iron Grip Barbell Co., Inc. v. USA Sports, Inc.*, 392 F.3d 1317, 1325 (Fed. Cir. 2004). DISH has provided no actual evidence of copying by [redacted] or any other entity. *See* RX-0001C (Richardson DWS) at Q/A 481.

I therefore find that DISH has not demonstrated copying.

Ex. 1009 216

IPR2024-00917 Reply 25, -00918 Reply 25, -00919 Reply 24
(all citing Ex. 1026 Houh Suppl. Decl. §XVII.B.4 (¶233))

PO's Claim That Apple Copied Is Based On Speculation

Patent Owner Response

The objective evidence suggests that competitors adopted MOVE's patented ABR technology. *See generally* EX2141, ¶¶264-269. . . . MOVE disclosed its ABR technology to Apple in 2006 under multiple NDAs. EX2141, ¶¶266-267; EX2065; EX2066. Although Apple declined to enter a business relationship with MOVE, it subsequently embraced adaptive bitrate streaming and developed the HLS Standard, which the ITC found is "very similar to what MOVE had developed and was using as a proposed standard." EX2073, 38:20-40:7 EX2100 ¶¶20-27; EX2102, 113:5-9, 138:13-18; 155:1-15; 156:6-15; EX2046.

IPR2024-00917 POR 67, -00918 POR 63, -00919 POR 66

David Ericson's Testimony



David Ericson

Former MOVE Employee
Declarant for Ex. 2100

Q And your belief that Apple followed what Move was doing is based on your own personal speculation. Is that correct?

* * *

A Yes. I mean, if somebody comes up with something that is similar to something they were exposed to that they hadn't come up with before, that would be an assumption.

Ex. 1030 Ericson Tr. 159:10-19

IPR2024-00917 Reply 25, -00918 Reply 25, -00919 Reply 24
(all citing Ex. 1026 Houh Suppl. Decl. §XVII.B.4 (¶233))

PO Never Explains How Microsoft Allegedly Copied

Patent Owner Response

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

IPR2024-00917 POR 67-68, -00918 POR 64, -00919 POR 66-67

Dr. Houh's Testimony



Dr. Henry Houh

234. Patent Owner and Dr. Jeffay similarly imply Microsoft copied by creating "its own version of HTTP-based ABR streaming technology," but never explain any link between it and the challenged claims—not even in the paragraph Patent Owner cites of Dr. Jeffay's testimony. IPR2024-00918, Paper 27 (Patent Owner Response) at 64 (citing Ex. 2141 ¶268).

Ex. 1026 Houh Suppl. Decl. ¶234

IPR2024-00917 Reply 25, -00918 Reply 25, -00919 Reply 24
(all citing Ex. 1026 Houh Suppl. Decl. §XVII.B.4 (¶234))

PO's Industry Praise Is Tied To Known Adaptive Bitrate (ABR) Technology

Patent Owner Response

When users praised MOVE's Media-Player as being "especially impressive," they tied this praise to the combination of claimed features, which smoothly shifted between bitrates and provided fluid, uninterrupted playback. . . .

* * *

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

IPR2024-00917 POR 68-69, -00918 POR 64-65, -00919 POR 67-68

Dr. Houh's Testimony



Dr. Henry Houh

For example Patent Owner quotes the ***same*** blog post to argue "the industry recognized MOVE's product as superior because it can 'stream videos at an adaptive rate . . .' and provide continuous playback" in the Ogdon IPRs as it does here. IPR2024-00918, Paper 27 (Patent Owner Response) at 65 & IPR2024-00043, Paper 21 (Patent Owner Response) at 60 (same, without underlined portion). The only difference is that Patent Owner tacks on a reference to "continuous playback," even though the post says nothing about this feature. Ex. 2051.

Ex. 1026 Houh Suppl. Decl. ¶237

IPR2024-00917 Reply 25-26, -00918 Reply 25-26, -00919 Reply 24-25
(all citing Ex. 1026 Houh Suppl. Decl. §XVII.B.5 (¶237))

PO's Reliance On A 2020 Emmy to SlingTV Lacks Nexus

David Ericson's Testimony



David Ericson

Former MOVE Employee

Q [W]e are looking at Exhibit 2023 in the current IPR, Mr. Ericson, and this is the press release from Sling TV. Do you see on the screen, where it says, "News provided by Sling TV LLC"?

* * *

A Yes.

Q So the [t]ext provided in Exhibit 2023 came from Sling TV. Is that right?

* * *

A My understanding would be this would be a press release that they are -- or some PR agency drafted.

Q And a PR agency working on behalf of Sling TV, right?

* * *

A Yes.

Ex. 1030 Ericson Tr. 240:4-25

IPR2024-00917 Reply 26, -00918 Reply 25-26, -00919 Reply 24-25

Ogdon IPR Final Written Decision

Patent Owner also cites a 2020 Emmy award recognizing SlingTV17 as evidence of industry praise. PO Resp. 63–64 (citing Ex. 2010 ¶ 21; Ex. 2013). Yet SlingTV's own press release states that this award relates to SlingTV's "over-the-top television service" that was "launched February 9, 2015." Ex. 2013. Patent Owner has made no attempt to show a nexus to any SlingTV product (*see* above note 11), and we find Patent Owner's statement that SlingTV "implemented the patented ABR [adaptive bitrate] technology after [Patent Owner] acquired MOVE [Networks] and the ABR Patents" (PO Resp. 63–64) is insufficient to establish nexus.

IPR2024-00043 FWD (Paper 59) 57 (footnote omitted)

PO's Alleged Praise From Blogs Is Tied To Known Adaptive Bitrate (ABR) Technology

Dr. Houh's Testimony



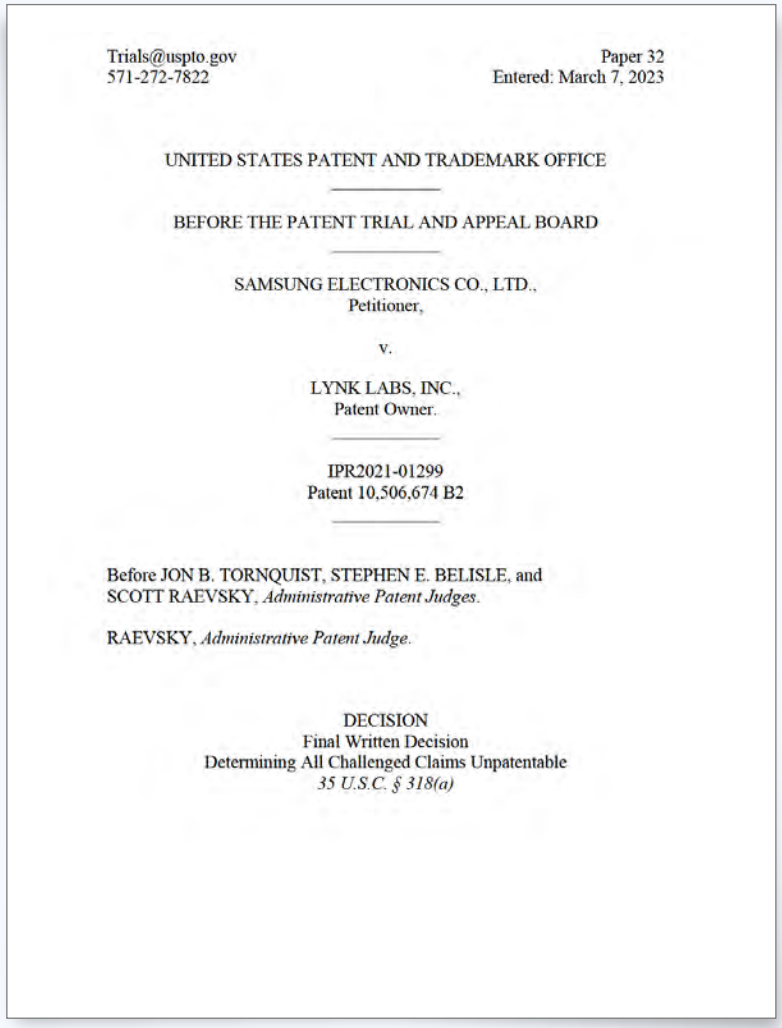
Dr. Henry Houh

Patent Owner argues that the ***same*** awards from AlwaysOn, Red Herring, and TechCrunchies that it relied on in the Ogdon IPRs are due to "using the claimed technology to achieve continuous playback." IPR2024-00918, Paper 27 (Patent Owner Response) at 65; Ex. 2141 ¶¶278-280 (relying on same awards). But in the Ogdon IPRs, Patent Owner argued only that they were due to "the patented ABR technology." IPR2024-00043, Paper 21 (Patent Owner Response) at 63. While Patent Owner now claims these awards are "link[ed] directly to the continuous playback," the single paragraph it cites of Dr. Jeffay's testimony to support this ***says no such thing***. IPR2024-00918, Paper 27 (Patent Owner Response) at 65-66 (citing Ex. 2141 ¶278). Dr. Jeffay actually testifies that these awards are "based on 'innovation, market potential, customer adoption, media buzz and investor value creation'" and "combining scalability with meaningful reporting and analytics" to create the first "business model that focuses on revenue generation for its content providers while distributing their content to millions of viewers simultaneously." Ex. 2141 ¶278 (quoting Ex. 2026).

Ex. 1026 Houh Suppl. Decl. ¶237

IPR2024-00917 Reply 26, -00918 Reply 25, -00919 Reply 24 (all citing Ex. 1026 Houh Suppl. Decl. §XVII.B.5 (¶237))

PO's Allegations That BT Did Not Commercialize Leaning's Video Is Irrelevant



Trials@uspto.gov
571-272-7822

Paper 32
Entered: March 7, 2023

UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE PATENT TRIAL AND APPEAL BOARD

SAMSUNG ELECTRONICS CO., LTD.,
Petitioner,

v.

LYNK LABS, INC.,
Patent Owner.

IPR2021-01299
Patent 10,506,674 B2

Before JON B. TORNQUIST, STEPHEN E. BELISLE, and SCOTT RAEVSKY, *Administrative Patent Judges*.

RAEVSKY, *Administrative Patent Judge*.

DECISION
Final Written Decision
Determining All Challenged Claims Unpatentable
35 U.S.C. § 318(a)

In our view, whether Petitioner's expert admitted to a lack of commercial implementation is indeed irrelevant. Petitioner need not show that the invention has been implemented into a prior art commercial product to establish obviousness. *See, e.g.*, 35 U.S.C. § 311(b) ("A petitioner in an inter partes review may request to cancel as unpatentable 1 or more claims of a patent only on a ground that could be raised under section 102 or 103 and *only on the basis of prior art consisting of patents or printed publications*." (emphasis added)).

***Samsung Elecs. Co. v. Lynk Labs, Inc.*, IPR2021-01299, Paper 32, at 19 (PTAB Mar. 7, 2023)**

IPR2024-00917 Reply 26-27, -00918 Reply 26-27, -00919 Reply 25-26

BT Asserted Leaning In Litigation Against Vimeo And Included It In Portfolio Licenses

Patent Owner Response

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

* * *

Despite BT's extensive record keeping protocols, Mr. Ratcliffe confirmed that he not only failed to "find any BT business record indicating that video implementation of [Leaning] (shown at pages 20-22) was ever licensed or commercialised," but Mr. Ratcliffe ***also confirmed with the Leaning inventors' direct manager that the video teachings were never commercialized***. *Id*. ¶8.

IPR2024-00917 POR 71-72, -00918 POR 68, -00919 POR 70-71

Peter Ratcliffe's Testimony



Peter Ratcliffe

British Telecom Employee

Q But when did you assert [Leaning] when it was alive?

A I think -- I think that was Vimeo in 2016.

* * *

Q [Y]ou testified that your portfolio licenses would generally include all issued U.S. and EP patents, right? At times, right?

A I never said those words. They are far too articulate for me. But as I say, they would have included, in theory, all of the patents in the portfolio. . . .

Ex. 1035 Ratcliffe Tr. 127:4-7, 139:11-140:3

IPR2024-00917 Reply 26-27, -00918 Reply 26-27, -00919 Reply 25-26 (all citing Ex. 1026 Houh Suppl. Decl. ¶¶216-219)

PO's Attorneys Initially Drafted Mr. Ratcliffe's Declaration And Directed Mr. Ratcliffe's Search

Patent Owner Response

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

* * *

Despite BT's extensive record keeping protocols, Mr. Ratcliffe confirmed that he not only failed to "find any BT business record indicating that video implementation of [Leaning] (shown at pages 20-22) was ever licensed or commercialised," but Mr. Ratcliffe ***also confirmed with the Leaning inventors' direct manager that the video teachings were never commercialized***. *Id*. ¶8.

IPR2024-00917 POR 71-72, -00918 POR 68, -00919 POR 70-71

Peter Ratcliffe's Testimony



Peter Ratcliffe

British Telecom Employee

Q So, Baker Botts, they prepared your draft declaration in the first instance; correct?

A Yes.

* * *

Q And you noted things that needed to be deleted because you thought they were inaccurate; fair?

A Yes, but on that one, on the assertion point, I added it and then I took it away. So this was not something from – Baker Botts didn't say, "You never asserted it" and I am saying, "Ah, we did."

This was me saying, "We never asserted it or licensed it" and then in a later draft saying, "Actually, I think we did assert this one. I want to take that word out."

Ex. 1035 Ratcliffe Tr. 158:5-159:8

IPR2024-00917 Reply 26-27, -00918 Reply 26-27, -00919 Reply 25-26 (all citing Ex. 1026 Houh Suppl. Decl. ¶¶216-219)

PO's Attorneys Initially Drafted Mr. Ratcliffe's Declaration And Directed Mr. Ratcliffe's Search

Patent Owner Response

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* * *

Despite BT's extensive record keeping protocols, Mr. Ratcliffe confirmed that he not only failed to "find any BT business record indicating that video implementation of [Leaning] (shown at pages 20-22) was ever licensed or commercialised," but Mr. Ratcliffe ***also confirmed with the Leaning inventors' direct manager that the video teachings were never commercialized***. *Id*. ¶8.

IPR2024-00917 POR 71-72, -00918 POR 68, -00919 POR 70-71

Peter Ratcliffe's Testimony



Peter Ratcliffe

British Telecom Employee

Q And when you searched the records and files referenced in paragraph 3, what was you search strategy?

A Gosh. I was looking for "Voyager," "Voyager 2000," keywords. I was also looking at the Leaning patent and the links that the Leaning patent record would have had had we ever licensed it. And also the attorney, patent attorney comments on the patent had it been involved in any trials at the time the invention was drafted.

Q And again, the reason you searched for Voyager 2000 is because that's the name of the product that Baker Botts provided you. Is that correct?

A Yes.

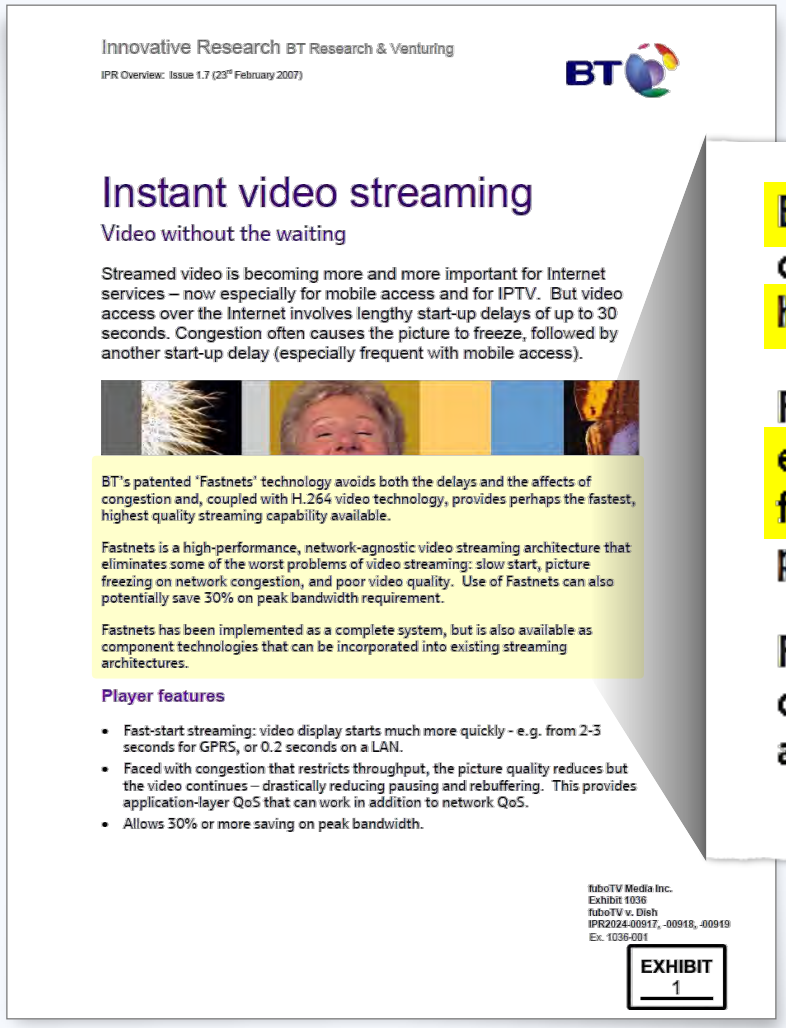
Q You did not search for any other specific product name; is that fair?

A Yes.

Ex. 1035 Ratcliffe Tr. 73:16-74:15

IPR2024-00917 Reply 26-27, -00918 Reply 26-27, -00919 Reply 25-26 (all citing Ex. 1026 Houh Suppl. Decl. ¶¶216-219)

BT Commercialized Leaning's Video As Part Of Fastnets



Innovative Research BT Research & Venturing

IPR Overview: Issue 1.7 (23rd February 2007)

BT

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.

Fastnets is a high-performance, network-agnostic video streaming architecture that eliminates some of the worst problems of video streaming: slow start, picture freezing on network congestion, and poor video quality. Use of Fastnets can also potentially save 30% on peak bandwidth requirement.

Fastnets has been implemented as a complete system, but is also available as component technologies that can be incorporated into existing streaming architectures.

Player features

- Fast-start streaming: video display starts much more quickly - e.g. from 2-3 seconds for GPRS, or 0.2 seconds on a LAN.
- Faced with congestion that restricts throughput, the picture quality reduces but the video continues – drastically reducing pausing and rebuffering. This provides application-layer QoS that can work in addition to network QoS.
- Allows 30% or more saving on peak bandwidth.

fuboTV Media Inc.
Exhibit 1036
fuboTV v. Dish
IPR2024-00917, -00918, -00919
Ex. 1036-001

EXHIBIT 1

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.

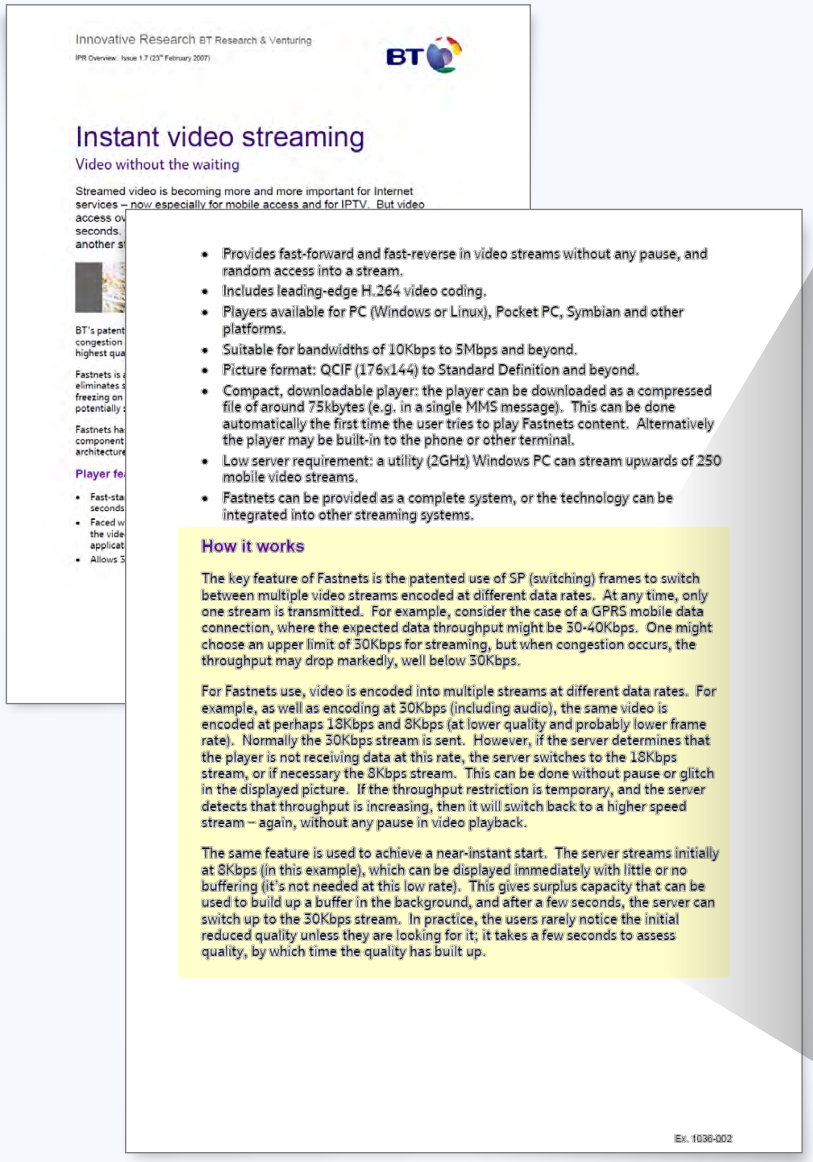
Fastnets is a high-performance, network-agnostic video streaming architecture that eliminates some of the worst problems of video streaming: slow start, picture freezing on network congestion, and poor video quality. Use of Fastnets can also potentially save 30% on peak bandwidth requirement.

Fastnets has been implemented as a complete system, but is also available as component technologies that can be incorporated into existing streaming architectures.

Ex. 1036 1

IPR2024-00917 Reply 26-27, -00918 Reply 26-27, -00919 Reply 25-26
(all citing Ex. 1026 Houh Suppl. Decl. ¶¶216-219)

BT Commercialized Leaning's Video As Part Of Fastnets



Innovative Research BT Research & Venturing

IPR Overview Issue 1.7 (25th February 2007)

BT

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 ov… seconds. … another s…

BT's patent… congestion… highest qua…

Fastnets is a… eliminates … freezing on… potentially …

Fastnets ha… component… architecture…

Player fe…

- Fast-sta… seconds…
- Faced w… the vide… applicat…
- Allows …

- Provides fast-forward and fast-reverse in video streams without any pause, and random access into a stream.
- Includes leading-edge H.264 video coding.
- Players available for PC (Windows or Linux), Pocket PC, Symbian and other platforms.
- Suitable for bandwidths of 10Kbps to 5Mbps and beyond.
- Picture format: QCIF (176x144) to Standard Definition and beyond.
- Compact, downloadable player: the player can be downloaded as a compressed file of around 75kbytes (e.g. in a single MMS message). This can be done automatically the first time the user tries to play Fastnets content. Alternatively the player may be built-in to the phone or other terminal.
- Low server requirement: a utility (2GHz) Windows PC can stream upwards of 250 mobile video streams.
- Fastnets can be provided as a complete system, or the technology can be integrated into other streaming systems.

How it works

The key feature of Fastnets is the patented use of SP (switching) frames to switch between multiple video streams encoded at different data rates. At any time, only one stream is transmitted. For example, consider the case of a GPRS mobile data connection, where the expected data throughput might be 30-40Kbps. One might choose an upper limit of 30Kbps for streaming, but when congestion occurs, the throughput may drop markedly, well below 30Kbps.

For Fastnets use, video is encoded into multiple streams at different data rates. For example, as well as encoding at 30Kbps (including audio), the same video is encoded at perhaps 18Kbps and 8Kbps (at lower quality and probably lower frame rate). Normally the 30Kbps stream is sent. However, if the server determines that the player is not receiving data at this rate, the server switches to the 18Kbps stream, or if necessary the 8Kbps stream. This can be done without pause or glitch in the displayed picture. If the throughput restriction is temporary, and the server detects that throughput is increasing, then it will switch back to a higher speed stream – again, without any pause in video playback.

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.

Ex. 1036-002

How it works

The key feature of Fastnets is the patented use of SP (switching) frames to switch between multiple video streams encoded at different data rates. At any time, only one stream is transmitted. For example, consider the case of a GPRS mobile data connection, where the expected data throughput might be 30-40Kbps. One might choose an upper limit of 30Kbps for streaming, but when congestion occurs, the throughput may drop markedly, well below 30Kbps.

For Fastnets use, video is encoded into multiple streams at different data rates. For example, as well as encoding at 30Kbps (including audio), the same video is encoded at perhaps 18Kbps and 8Kbps (at lower quality and probably lower frame rate). Normally the 30Kbps stream is sent. However, if the server determines that the player is not receiving data at this rate, the server switches to the 18Kbps stream, or if necessary the 8Kbps stream. This can be done without pause or glitch in the displayed picture. If the throughput restriction is temporary, and the server detects that throughput is increasing, then it will switch back to a higher speed stream – again, without any pause in video playback.

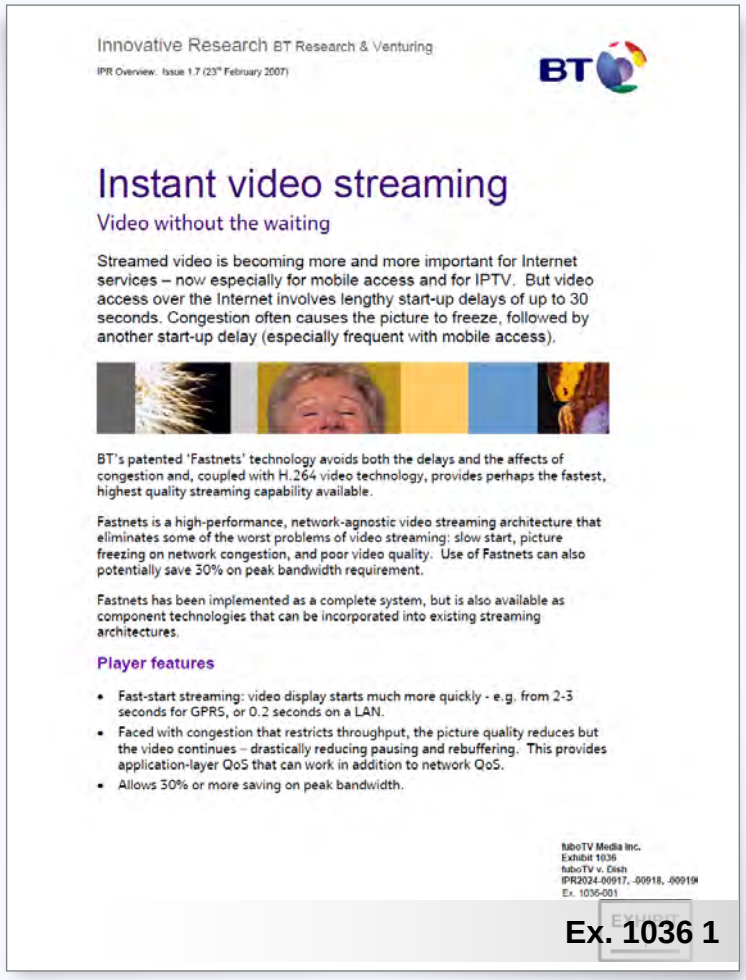
The same feature is used to achieve a near-instant start. The server streams initially at 8Kbps (in this example), which can be displayed immediately with little or no buffering (it's not needed at this low rate). This gives surplus capacity that can be used to build up a buffer in the background, and 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.

Ex. 1036 2

IPR2024-00917 Reply 26-27, -00918 Reply 26-27, -00919 Reply 25-26 (all citing Ex. 1026 Houh Suppl. Decl. ¶¶216-219)

BT Commercialized Leaning's Video As Part Of Fastnets

After being shown Ex. 1036, Mr. Ratcliffe admitted:



Innovative Research BT Research & Venturing

IPR Overview: Issue 1.7 (23rd February 2007)

BT

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.

Fastnets is a high-performance, network-agnostic video streaming architecture that eliminates some of the worst problems of video streaming: slow start, picture freezing on network congestion, and poor video quality. Use of Fastnets can also potentially save 30% on peak bandwidth requirement.

Fastnets has been implemented as a complete system, but is also available as component technologies that can be incorporated into existing streaming architectures.

Player features

- Fast-start streaming: video display starts much more quickly - e.g. from 2-3 seconds for GPRS, or 0.2 seconds on a LAN.
- Faced with congestion that restricts throughput, the picture quality reduces but the video continues – drastically reducing pausing and rebuffering. This provides application-layer QoS that can work in addition to network QoS.
- Allows 30% or more saving on peak bandwidth.

fuboTV Media Inc.
Exhibit 1036
fuboTV v. Dish
IPR2024-00917, -00918, -00919
Ex. 1036-001

EXHIBIT

Ex. 1036 1

Peter Ratcliffe's Testimony



Peter Ratcliffe

British Telecom Employee

Q Sitting here today, do you have any reason to dispute that British Telecom commercialized streaming technology where a key feature was the patented use of switching frames between multiple video streams encoded at different data rates?

* * *

A That was the aspiration of the article so I don't doubt it. Somebody somewhere must have had reason to write those words.

Ex. 1035 Ratcliffe Tr. 111:6-16

IPR2024-00917 Reply 26-27, -00918 Reply 26-27, -00919 Reply 25-26 (all citing Ex. 1026 Houh Suppl. Decl. ¶216)

Appendix

U.S Patent No. 10,757,156 ("The '156 Patent")

’156 Patent, Claim 1

1[Pre]	An apparatus for rendering a video that is adaptively received as a digital stream from a video server over a network, the apparatus comprising:
1[A][1]	a media player operating on the apparatus,
1[A][2]	wherein the media player is configured to stream the video from the video server via at least one transmission control protocol (TCP) connection over the network,
1[A][3]	wherein the video server stores multiple different copies of the video encoded at different bit rates as multiple sets of streamlets,
1[A][4]	wherein each of the streamlets yields a different portion of the video on playback,
1[A][5]	wherein the streamlets across the different copies yield the same portions of the video on playback,

’156 Patent, Claim 1 (Continued)

1[A][6]	and wherein the streamlets in the different copies are aligned in time such that the streamlets that play back the same portion of the video for the different copies each begin at the same playback time in relation to the beginning of the video, and wherein the media player streams the video by:
1[B][1]	requesting sequential streamlets of one of the copies from the video server according to the playback times of the streamlets by transmitting hypertext transport protocol (HTTP) GET requests that identify the selected streamlets stored by the video server,
1[B][2]	wherein the sequential streamlets are selected by the media player from the based upon successive determinations to shift the playback quality to a higher or lower quality one of the different copies of the video;
1[C]	repeatedly generating, by the media player, a factor relating to the performance of the network that is indicative of an ability to sustain the streaming of the video;
1[D]	adapting the determinations to shift the playback quality based on the factor to achieve continuous playbasuccessiveck of the video using the streamlets of the highest quality copy of the video that is determined to be sustainable at that time; and
1[E]	presenting the video for playback by providing the requested streamlets in order of ascending start time.

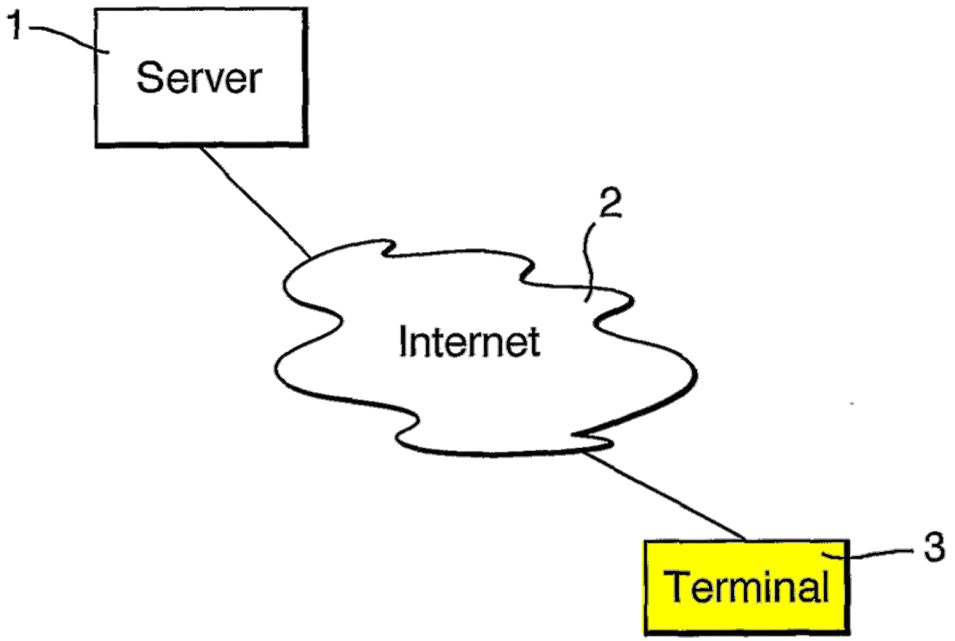
’156 Patent, Claim 1 Preamble

1[Pre] An apparatus for rendering a video that is adaptively received as a digital stream from a video server over a network, the apparatus comprising:

Leaning

(57) Abstract: Delivery of recorded audio or video material over a telecommunications link (2) from a server (1) to a terminal (3) is accomplished by dividing the material into a sequence of sub-files each of which is independently requested by the terminal, which thereby has control of the rate of delivery. Provision may be made for switching between alternative sub-file sets representing alternative delivery modes of data rates.

Ex. 1004 Leaning Abstract



Ex. 1004 Leaning Fig. 1

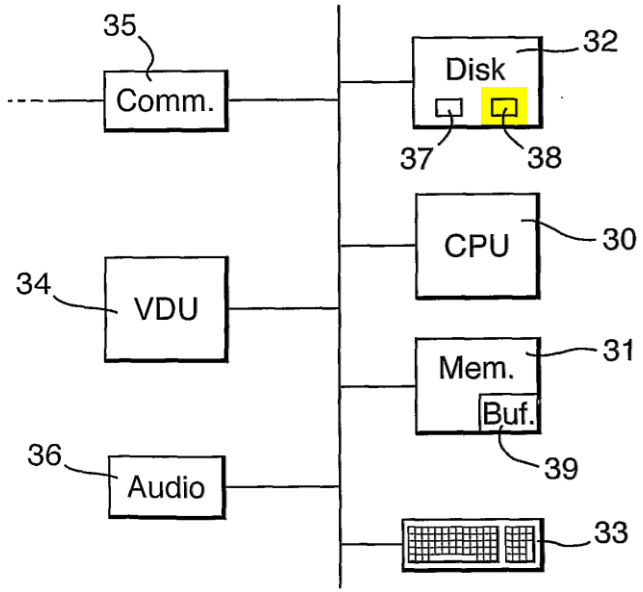
’156 Patent, 1[A][1]

1[A][1] a media player operating on the apparatus,

Leaning

incorporated into a mobile telephone. Thus Figure 2 shows such a terminal with a central processor 30, memory 31, a disk store 32, a keyboard 33, video display 34, communications interface 35, and audio interface (“sound card”) 36. For video delivery, a video card would be fitted in place of, or in addition to, the card 36. In the disk store are programs which may be retrieved into the memory 31 for execution by the processor 30, in the usual manner. These programs include a communications program 37 for call-up and display of html pages - that is, a “web browser” program such as Netscape Navigator or Microsoft Explorer, and a further program 38 which will be referred to here as “the player program” which provides the functionality necessary for the playing of audio files in accordance with this embodiment of the invention. Also

Ex. 1004 Leaning 4:7-15



Ex. 1004 Leaning Fig. 2

IPR2024-00917 Pet. 17-18

’156 Patent, 1[A][2]

1[A][2] wherein the media player is configured to stream the video from the video server via at least one transmission control protocol (TCP) connection over the network,

Leaning

The system shown in Figure 1 has as its object the delivery, to a user, of digitally coded audio signals (for example, of recorded music or speech) via a telecommunications network to a user terminal where the corresponding sounds are to be played to the user. However, as will be discussed in more detail below, the system may be used to convey video signals instead of, or in addition to, audio signals. In this example, the network is the internet or other packet network operating in accordance with the Hypertext Transfer Protocol (see RFCs 1945/2068 for details), though in principle other digital links or networks can be used. It is also assumed that the audio

Ex. 1004 Leaning 2:5-11

Dr. Houh Declaration

transmitting the required sub-file.”). For example, a POSITA would have known that a terminal requesting sequential subfiles from an ordinary web server using the HTTP 1.0 protocol (RCF1945) (EX1004, 2:10) as disclosed by Leaning would require using multiple TCP connections because each HTTP request in HTTP 1.0 must establish a new TCP connection to request and receive each sequential subfile.

IPR2024-00917 Ex. 1003, Houh Decl. ¶59

IPR2024-00917 Pet. 18-20

'156 Patent, 1[A][3]

1[A][3] wherein the video server stores multiple different copies of the video encoded at different bit rates as multiple sets of streamlets,

Leaning

a) the server stores two or more versions of the recording, recorded at different compression rates (for example at compressions corresponding to (continuous) data rates of 8, 16, 24 and 32 kbit/s respectively) and the player program is able to switch automatically between them.

Ex. 1004 Leaning 6:13-16

The same principle may be applied to the delivery of video recordings, or of course, video 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.

As in the audio case, there may be two or more recordings corresponding to different data rates, selected by the control mechanism already described. Also one can provide additional

Ex. 1004 Leaning 16:6-12

IPR2024-00917 Pet. 20-21

’156 Patent, 1[A][4]

1[A][4] wherein each of the streamlets yields a different portion of the video on playback,

Leaning

In another aspect, the invention provides a method of transmitting digitally coded audio or video material comprising:

partitioning the material into a plurality of discrete files each representing successive temporal portions of the said material;

storing the files at a first station; and

at a second station –

a) transmitting to the first station requests for successive respective ones of the files;

b) receiving the files; and

c) decoding the files for replay of the material.

Ex. 1004 Leaning 1:20-28

’156 Patent, 1[A][5]

1[A][5] wherein the streamlets across the different copies yield the same portions of the video on playback,

Leaning

Directory	Subdirectory	Filename
mp3_bwv565	none	link.htm index.htm
mp3_bwv565	008k_11_m	000000.bin 000001.bin 000002.bin 000003.bin . . 000134.bin
mp3_bwv565	016k_11_m	000000.bin 000001.bin 000002.bin 000003.bin . . 000134.bin
mp3_bwv565	018k_11_s	000000.bin 000001.bin 000002.bin 000003.bin . . 000134.bin
mp3_bwv565	024k_11_s	000000.bin 000001.bin 000002.bin 000003.bin . . 000134.bin
mp3_bwv565	032k_11_s	000000.bin 000001.bin 000002.bin 000003.bin . . 000134.bin

Pet. 22 (annotating Ex. 1004 Leaning 7)

IPR2024-00917 Pet. 22-25

’156 Patent, 1[A][6]

1[A][6] and wherein the streamlets in the different copies are aligned in time such that the streamlets that play back the same portion of the video for the different copies each begin at the same playback time in relation to the beginning of the video, and wherein the media player streams the video by:

Leaning

number of frames. In the case of rate switching, it is, if not actually essential, highly desirable that the sub-file boundaries are the same for each rate, so that the first sub-file received for a new rate continues from the same point in the recording that the last sub-file at the old rate ended. To

Ex. 1004 Leaning 12:16-18

’156 Patent, 1[B][1]

1[B][1] requesting sequential streamlets of one of the copies from the video server according to the playback times of the streamlets by transmitting hypertext transport protocol (HTTP) GET requests that identify the selected streamlets stored by the video server,

Leaning

(57) Abstract: Delivery of recorded audio or video material over a telecommunications link (2) from a server (1) to a terminal (3) is accomplished by dividing the material into a sequence of sub-files each of which is independently requested by the terminal, which thereby has control of the rate of delivery. Provision may be made for switching between alternative sub-file sets representing alternative delivery modes of data rates.

Ex. 1004 Leaning Abstract

According to one aspect of the invention there is provided a terminal for playing audio or video material which is stored on a remote server as a set of files representing successive temporal portions of the said material, the terminal comprising:

a telecommunications interface for communication with the server;

a buffer for receiving the files from the telecommunications interface;

means for playing the contents of the buffer; and

control means responsive to the state of the buffer to generate request messages for further files for replenishment of the buffer.

Ex. 1004 Leaning 1:12-19

IPR2024-00917 Pet. 27

'156 Patent, 1[B][2]

1[B][2] wherein the sequential streamlets are selected by the media player from the based upon successive determinations to shift the playback quality to a higher or lower quality one of the different copies of the video;

Leaning

The initiation of a rate change is triggered:

a) if the buffer ever empties AND the measured rate is less than the current rate AND the measured Buffer Low Percentage exceeds a Step Down Threshold (as described below), reduce the current rate; (changing at a time when the buffer is already empty is advantageous as the sound card is not playing anything and it may be necessary to reconfigure it if the audio sampling rate, stereo–mono setting or bit width (number of bits per sample) has changed).

b) if the measured rate exceeds not only the current rate but also the next higher rate for a given period of time (e.g. 120 seconds: this could if desired be made adjustable by the user) increase the current rate

Ex. 1004 Leaning 8:17-26

’156 Patent, 1[C]

1[C] repeatedly generating, by the media player, a factor relating to the performance of the network that is indicative of an ability to sustain the streaming of the video;

Leaning

The initiation of a rate change is triggered:

a) if the buffer ever empties AND the measured rate is less than the current rate AND the measured Buffer Low Percentage exceeds a Step Down Threshold (as described below), reduce the current rate; (changing at a time when the buffer is already empty is advantageous as the sound card is not playing anything and it may be necessary to reconfigure it if the audio sampling rate, stereo–mono setting or bit width (number of bits per sample) has changed).

b) if the measured rate exceeds not only the current rate but also the next higher rate for a given period of time (e.g. 120 seconds: this could if desired be made adjustable by the user) increase the current rate

Ex. 1004 Leaning 8:17-26

IPR2024-00917 Pet. 36

’156 Patent, 1[D]

1[D] 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; and

Leaning

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.

Ex. 1004 Leaning 15:3-8

IPR2024-00917 Pet. 37-39

’156 Patent, 1[E]

1[E] presenting the video for playback by providing the requested streamlets in order of ascending start time.

Leaning

According to one aspect of the invention there is provided a terminal for playing audio or video material which is stored on a remote server as a set of files representing successive temporal portions of the said material, the terminal comprising:

a telecommunications interface for communication with the server;

a buffer for receiving the files from the telecommunications interface;

means for playing the contents of the buffer; and

control means responsive to the state of the buffer to generate request messages for further files for replenishment of the buffer.

Ex. 1004 Leaning 1:12-19

number of frames. In the case of rate switching, it is, if not actually essential, highly desirable that the sub-file boundaries are the same for each rate, so that the first sub-file received for a new rate continues from the same point in the recording that the last sub-file at the old rate ended. To

Ex. 1004 Leaning 12:16-18

IPR2024-00917 Pet. 36-39

U.S Patent No. 9,407,564 ("The '564 Patent")

’564 Patent, Claim 1

1[Pre]	An end user station for adaptive-rate content streaming of digital content from a video server over a network, the end user station comprising:
1[A][1]	a media player operating on the end user station
1[A][2]	configured to stream a video from the video server via at least one transmission control protocol (TCP) connection over the network,
1[A][3]	wherein multiple different copies of the video encoded at different bit rates are stored on the video server as multiple sets of files,
1[A][4]	wherein each of the files yields a different portion of the video on playback,
1[A][5]	wherein the files across the different copies yield the same portions of the video on playback,

’564 Patent, Claim 1 (Continued)

1[A][6]	and wherein each of the files comprises a time index such that the files whose playback is the same portion of the video for each of the different copies have the same time index in relation to the beginning of the video, and wherein the media player streams the video by:
1[B]	requesting a plurality of sequential files of one of the copies from the video server based on the time indexes;
1[C][1]	automatically requesting from the video server subsequent portions of the video by requesting for each such portion one of the files from one of the copies dependent upon successive determinations by the media player to shift the playback quality to a higher or lower quality one of the different copies, the automatically requesting including
1[C][2]	repeatedly generating a factor indicative of the current ability to sustain the streaming of the video using the files from different ones of the copies, wherein the set of one or more factors relate to the performance of the network;
1[D]	making the successive determinations to shift the playback quality based on the factor to achieve continuous playback of the video using the files of the highest quality one of the copies determined sustainable at that time so that the media player upshifts to a higher quality one of the different copies when the factor is greater than a first threshold and downshifts to a lower quality one of the different copies when the factor is less than a second threshold; and
1[E]	presenting the video by playing back the requested media files with the media player on the end user station in order of ascending playback time.

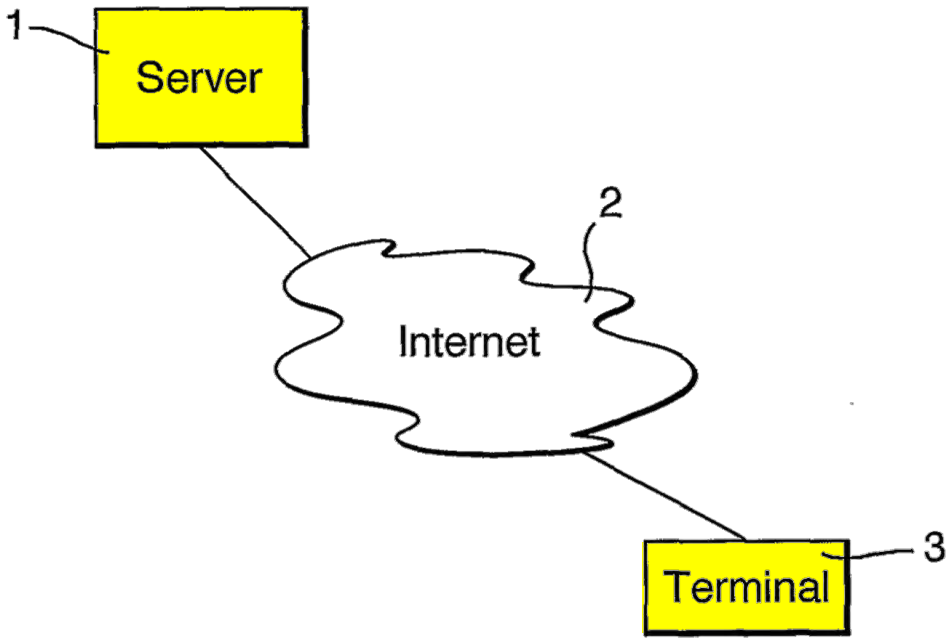
’564 Patent, Claim 1 Preamble

1[Pre] An end user station for adaptive-rate content streaming of digital content from a video server over a network, the end user station comprising:

Leaning

(57) Abstract: Delivery of recorded audio or video material over a telecommunications link (2) from a server (1) to a terminal (3) is accomplished by dividing the material into a sequence of sub-files each of which is independently requested by the terminal, which thereby has control of the rate of delivery. Provision may be made for switching between alternative sub-file sets representing alternative delivery modes of data rates.

Ex. 1004 Leaning Abstract



Ex. 1004 Leaning Fig. 1

IPR2024-00918 Pet. 16-17

’564 Patent, 1[A][1]

1[A][1] a media player operating on the end user station

Leaning

incorporated into a mobile telephone. Thus Figure 2 shows such a terminal with a central processor 30, memory 31, a disk store 32, a keyboard 33, video display 34, communications interface 35, and audio interface (“sound card”) 36. For video delivery, a video card would be fitted in place of, or in addition to, the card 36. In the disk store are programs which may be retrieved into the memory 31 for execution by the processor 30, in the usual manner. These programs include a communications program 37 for call-up and display of html pages - that is, a “web browser” program such as Netscape Navigator or Microsoft Explorer, and a further program 38 which will be referred to here as “the player program” which provides the functionality necessary for the playing of audio files in accordance with this embodiment of the invention. Also

Ex. 1004 Leaning 4:7-15

IPR2024-00918 Pet. 17

’564 Patent, 1[A][2]

1[A][2] configured to stream a video from the video server via at least one transmission control protocol (TCP) connection over the network,

Leaning

The system shown in Figure 1 has as its object the delivery, to a user, of digitally coded audio signals (for example, of recorded music or speech) via a telecommunications network to a user terminal where the corresponding sounds are to be played to the user. However, as will be discussed in more detail below, the system may be used to convey video signals instead of, or in addition to, audio signals. In this example, the network is the internet or other packet network operating in accordance with the Hypertext Transfer Protocol (see RFCs 1945/2068 for details), though in principle other digital links or networks can be used. It is also assumed that the audio

Ex. 1004 Leaning 2:5-11

Dr. Houh Declaration

transmitting the required sub-file.”). For example, a POSITA would have known that a terminal requesting sequential subfiles from an ordinary web server using the HTTP 1.0 protocol (RCF1945) (EX1004, 2:10) as disclosed by Leaning would require using multiple TCP connections because each HTTP request in HTTP 1.0 must establish a new TCP connection to request and receive each sequential subfile.

IPR2024-00917 Ex. 1003 Houh Decl. ¶59

IPR2024-00918 Pet. 18-20

’564 Patent, 1[A][3]

1[A][3] wherein multiple different copies of the video encoded at different bit rates are stored on the video server as multiple sets of files,

Leaning

a) the server stores two or more versions of the recording, recorded at different compression rates (for example at compressions corresponding to (continuous) data rates of 8, 16, 24 and 32 kbit/s respectively) and the player program is able to switch automatically between them.

Ex. 1004 Leaning 6:13-16

The same principle may be applied to the delivery of video recordings, or of course, video 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.

As in the audio case, there may be two or more recordings corresponding to different data rates, selected by the control mechanism already described. Also one can provide additional

Ex. 1004 Leaning 16:6-12

IPR2024-00918 Pet. 20-21

’564 Patent, 1[A][4]

1[A][4] wherein each of the files yields a different portion of the video on playback,

Leaning

In another aspect, the invention provides a method of transmitting digitally coded audio or video material comprising:

partitioning the material into a plurality of discrete files each representing successive temporal portions of the said material;

storing the files at a first station; and

at a second station –

a) transmitting to the first station requests for successive respective ones of the files;

b) receiving the files; and

c) decoding the files for replay of the material.

Ex. 1004 Leaning 1:20-28

IPR2024-00918 Pet. 22-23

’564 Patent, 1[A][5]

1[A][5] wherein the files across the different copies yield the same portions of the video on playback,

Leaning

Directory	Subdirectory	Filename
mp3_bwv565	none	link.htm index.htm
mp3_bwv565	008k_11_m	000000.bin 000001.bin 000002.bin 000003.bin . . 000134.bin
mp3_bwv565	016k_11_m	000000.bin 000001.bin 000002.bin 000003.bin . . 000134.bin
mp3_bwv565	018k_11_s	000000.bin 000001.bin 000002.bin 000003.bin . . 000134.bin
mp3_bwv565	024k_11_s	000000.bin 000001.bin 000002.bin 000003.bin . . 000134.bin
mp3_bwv565	032k_11_s	000000.bin 000001.bin 000002.bin 000003.bin . . 000134.bin

Pet. 22 (annotating Ex. 1004 Leaning 7)

IPR2024-00919 Pet. 22-23

’564 Patent, 1[A][6]

1[A][6] and wherein each of the files comprises a time index such that the files whose playback is the same portion of the video for each of the different copies have the same time index in relation to the beginning of the video, and wherein the media player streams the video by:

Leaning

number of frames. In the case of rate switching, it is, if not actually essential, highly desirable that the sub-file boundaries are the same for each rate, so that the first sub-file received for a new rate continues from the same point in the recording that the last sub-file at the old rate ended. To

Ex. 1004 Leaning 12:16-18

IPR2024-00918 Pet. 24-25

’564 Patent, 1[B]

1[B] requesting a plurality of sequential files of one of the copies from the video server based on the time indexes;

Leaning

(57) Abstract: Delivery of recorded audio or video material over a telecommunications link (2) from a server (1) to a terminal (3) is accomplished by dividing the material into a sequence of sub-files each of which is independently requested by the terminal, which thereby has control of the rate of delivery. Provision may be made for switching between alternative sub-file sets representing alternative delivery modes of data rates.

Ex. 1004 Leaning Abstract

According to one aspect of the invention there is provided a terminal for playing audio or video material which is stored on a remote server as a set of files representing successive temporal portions of the said material, the terminal comprising:

a telecommunications interface for communication with the server;

a buffer for receiving the files from the telecommunications interface;

means for playing the contents of the buffer; and

control means responsive to the state of the buffer to generate request messages for further files for replenishment of the buffer.

Ex. 1004 Leaning 1:12-19

IPR2024-00918 Pet. 28-32

’564 Patent, 1[C][1]

1[C][1] automatically requesting from the video server subsequent portions of the video by requesting for each such portion one of the files from one of the copies dependent upon successive determinations by the media player to shift the playback quality to a higher or lower quality one of the different copies, the automatically requesting including

Leaning

The initiation of a rate change is triggered:

a) if the buffer ever empties AND the measured rate is less than the current rate AND the measured Buffer Low Percentage exceeds a Step Down Threshold (as described below), reduce the current rate; (changing at a time when the buffer is already empty is advantageous as the sound card is not playing anything and it may be necessary to reconfigure it if the audio sampling rate, stereo–mono setting or bit width (number of bits per sample) has changed).

b) if the measured rate exceeds not only the current rate but also the next higher rate for a given period of time (e.g. 120 seconds: this could if desired be made adjustable by the user) increase the current rate

Ex. 1004 Leaning 8:17-26

IPR2024-00918 Pet. 33-34

’564 Patent, 1[C][2]

1[C][2] repeatedly generating a factor indicative of the current ability to sustain the streaming of the video using the files from different ones of the copies, wherein the set of one or more factors relate to the performance of the network;

Leaning

The initiation of a rate change is triggered:

a) if the buffer ever empties AND the measured rate is less than the current rate AND the measured Buffer Low Percentage exceeds a Step Down Threshold (as described below), reduce the current rate; (changing at a time when the buffer is already empty is advantageous as the sound card is not playing anything and it may be necessary to reconfigure it if the audio sampling rate, stereo–mono setting or bit width (number of bits per sample) has changed).

b) if the measured rate exceeds not only the current rate but also the next higher rate for a given period of time (e.g. 120 seconds: this could if desired be made adjustable by the user) increase the current rate

Ex. 1004 Leaning 8:17-26

IPR2024-00918 Pet. 35-36

’564 Patent, 1[D]

1[D] making the successive determinations to shift the playback quality based on the factor to achieve continuous playback of the video using the files of the highest quality one of the copies determined sustainable at that time so that the media player upshifts to a higher quality one of the different copies when the factor is greater than a first threshold and downshifts to a lower quality one of the different copies when the factor is less than a second threshold; and

Leaning

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.

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’564 Patent, 1[E]

1[E] presenting the video by playing back the requested media files with the media player on the end user station in order of ascending playback time.

Leaning

According to one aspect of the invention there is provided a terminal for playing audio or video material which is stored on a remote server as a set of files representing successive temporal portions of the said material, the terminal comprising:

a telecommunications interface for communication with the server;

a buffer for receiving the files from the telecommunications interface;

means for playing the contents of the buffer; and

control means responsive to the state of the buffer to generate request messages for further files for replenishment of the buffer.

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Leaning

number of frames. In the case of rate switching, it is, if not actually essential, highly desirable that the sub-file boundaries are the same for each rate, so that the first sub-file received for a new rate continues from the same point in the recording that the last sub-file at the old rate ended. To

Ex. 1004 Leaning 12:16-18

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U.S Patent No. 8,868,772 ("The '772 Patent")

’772 Patent, Claim 1

1[Pre]	A method for presenting rate-adaptive streams, the method comprising:
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[A][3]	wherein each of the multiple files yields a different portion of the video on playback,
1[A][4]	wherein the multiple files across the different copies yield the same portions of the video on playback,
1[A][5]	each of said files having a time index such that the files whose playback is the same portion of the video for each of the different copies have the same time index in relation to the beginning of the video, and wherein the streaming comprises:

’772 Patent, Claim 1 (Continued)

1[B]	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;
1[C]	automatically requesting by the media player from the set of servers over the plurality of TCP connections subsequent portions of the video by requesting for each such portion one of the files from one of the copies dependent upon successive determinations by the media player to shift the playback quality to a higher or lower quality one of the different copies, said automatically requesting including,
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, wherein the set of one or more factors relate to the performance of the network; and
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; and
1[F]	presenting the video by playing back with the media player on the end user station the requested files in order of ascending playback time.

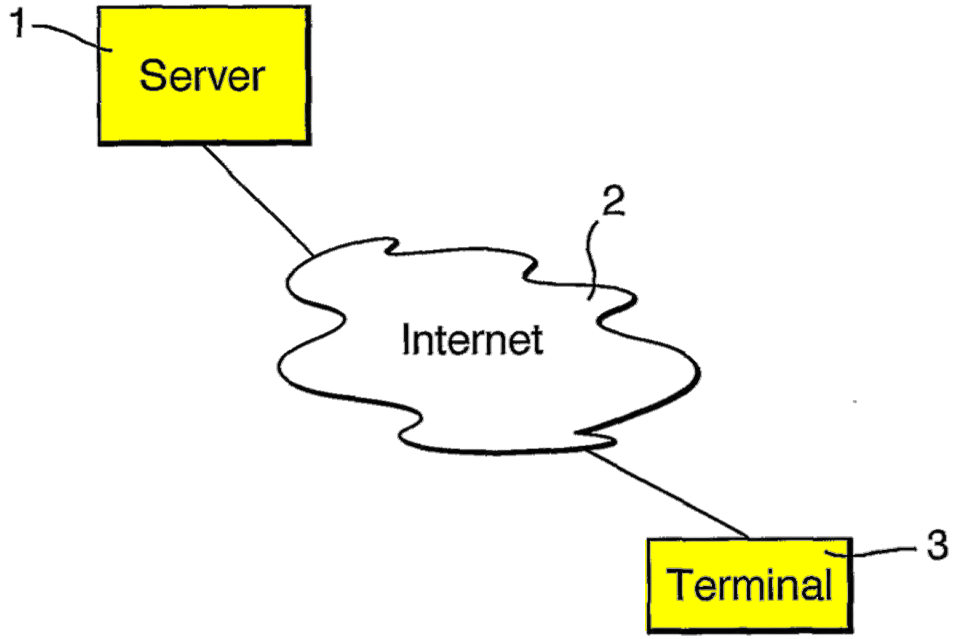
’772 Patent, Claim 1 Preamble

1[Pre] A method for presenting rate-adaptive streams, the method comprising:

Leaning

(57) Abstract: Delivery of recorded audio or video material over a telecommunications link (2) from a server (1) to a terminal (3) is accomplished by dividing the material into a sequence of sub-files each of which is independently requested by the terminal, which thereby has control of the rate of delivery. Provision may be made for switching between alternative sub-file sets representing alternative delivery modes of data rates.

Ex. 1004 Leaning Abstract



Ex. 1004 Leaning Fig. 1

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’772 Patent, 1[A][1]

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

Leaning

incorporated into a mobile telephone. Thus Figure 2 shows such a terminal with a central processor 30, memory 31, a disk store 32, a keyboard 33, video display 34, communications interface 35, and audio interface (“sound card”) 36. For video delivery, a video card would be fitted in place of, or in addition to, the card 36. In the disk store are programs which may be retrieved into the memory 31 for execution by the processor 30, in the usual manner. These programs include a communications program 37 for call-up and display of html pages - that is, a “web browser” program such as Netscape Navigator or Microsoft Explorer, and a further program 38 which will be referred to here as “the player program” which provides the functionality necessary for the playing of audio files in accordance with this embodiment of the invention. Also

Ex. 1004 Leaning 4:7-15

Leaning

According to one aspect of the invention there is provided a terminal for playing audio or video material which is stored on a remote server as a set of files representing successive temporal portions of the said material, the terminal comprising:

a telecommunications interface for communication with the server;

a buffer for receiving the files from the telecommunications interface;

means for playing the contents of the buffer; and

control means responsive to the state of the buffer to generate request messages for further files for replenishment of the buffer.

Ex. 1004 Leaning 1:12-19

'772 Patent, 1[A][2]

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,

Leaning

a) the server stores two or more versions of the recording, recorded at different compression rates (for example at compressions corresponding to (continuous) data rates of 8, 16, 24 and 32 kbit/s respectively) and the player program is able to switch automatically between them.

Ex. 1004 Leaning 6:13-15

The same principle may be applied to the delivery of video recordings, or of course, video 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.

As in the audio case, there may be two or more recordings corresponding to different data rates, selected by the control mechanism already described. Also one can provide additional

Ex. 1004 Leaning 16:6-12

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’772 Patent, 1[A][3]

1[A][3] wherein each of the multiple files yields a different portion of the video on playback,

Leaning

In another aspect, the invention provides a method of transmitting digitally coded audio or video material comprising:

partitioning the material into a plurality of discrete files each representing successive temporal portions of the said material;

storing the files at a first station; and

at a second station –

a) transmitting to the first station requests for successive respective ones of the files;

b) receiving the files; and

c) decoding the files for replay of the material.

Ex. 1004 Leaning 1:20-28

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’772 Patent, 1[A][4]

1[A][4] wherein the multiple files across the different copies yield the same portions of the video on playback,

Leaning

number of frames. In the case of rate switching, it is, if not actually essential, highly desirable that the sub-file boundaries are the same for each rate, so that the first sub-file received for a new rate continues from the same point in the recording that the last sub-file at the old rate ended. To

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’772 Patent, 1[A][5]

1[A][5] each of said files having a time index such that the files whose playback is the same portion of the video for each of the different copies have the same time index in relation to the beginning of the video, and wherein the streaming comprises:

Leaning

The system shown in Figure 1 has as its object the delivery, to a user, of digitally coded audio signals (for example, of recorded music or speech) via a telecommunications network to a user terminal where the corresponding sounds are to be played to the user. However, as will be discussed in more detail below, the system may be used to convey video signals instead of, or in addition to, audio signals. In this example, the network is the internet or other packet network operating in accordance with the Hypertext Transfer Protocol (see RFCs 1945/2068 for details), though in principle other digital links or networks can be used. It is also assumed that the audio

Ex. 1004 Leaning 2:5-11

Leaning



Directory	Subdirectory	Filename
mp3_bwv565	none	link.htm index.htm
mp3_bwv565	008k_11_m	000000.bin 000001.bin 000002.bin 000003.bin . . 000134.bin
mp3_bwv565	016k_11_m	000000.bin 000001.bin 000002.bin 000003.bin . . 000134.bin
mp3_bwv565	018k_11_s	000000.bin 000001.bin 000002.bin 000003.bin . . 000134.bin
mp3_bwv565	024k_11_s	000000.bin 000001.bin 000002.bin 000003.bin . . 000134.bin
mp3_bwv565	032k_11_s	000000.bin 000001.bin 000002.bin 000003.bin . . 000134.bin

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’772 Patent, 1[B]

1[B] 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;

Leaning

(57) Abstract: Delivery of recorded audio or video material over a telecommunications link (2) from a server (1) to a terminal (3) is accomplished by dividing the material into a sequence of sub-files each of which is independently requested by the terminal, which thereby has control of the rate of delivery. Provision may be made for switching between alternative sub-file sets representing alternative delivery modes of data rates.

Ex. 1004 Leaning Abstract

According to one aspect of the invention there is provided a terminal for playing audio or video material which is stored on a remote server as a set of files representing successive temporal portions of the said material, the terminal comprising:

a telecommunications interface for communication with the server;

a buffer for receiving the files from the telecommunications interface;

means for playing the contents of the buffer; and

control means responsive to the state of the buffer to generate request messages for further files for replenishment of the buffer.

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’772 Patent, 1[B]

1[B] 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;

Leaning

The system shown in Figure 1 has as its object the delivery, to a user, of digitally coded audio signals (for example, of recorded music or speech) via a telecommunications network to a user terminal where the corresponding sounds are to be played to the user. However, as will be discussed in more detail below, the system may be used to convey video signals instead of, or in addition to, audio signals. In this example, the network is the internet or other packet network operating in accordance with the Hypertext Transfer Protocol (see RFCs 1945/2068 for details), though in principle other digital links or networks can be used. It is also assumed that the audio

Ex. 1004 Leaning 2:5-11

Dr. Houh Declaration

transmitting the required sub-file.”). For example, a POSITA would have known that a terminal requesting sequential subfiles from an ordinary web server using the HTTP 1.0 protocol (RCF1945) (EX1004, 2:10) as disclosed by Leaning would require using multiple TCP connections because each HTTP request in HTTP 1.0 must establish a new TCP connection to request and receive each sequential subfile.

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’772 Patent, 1[C]

1[C] automatically requesting by the media player from the set of servers over the plurality of TCP connections subsequent portions of the video by requesting for each such portion one of the files from one of the copies dependent upon successive determinations by the media player to shift the playback quality to a higher or lower quality one of the different copies, said automatically requesting including,

Leaning

The initiation of a rate change is triggered:

a) if the buffer ever empties AND the measured rate is less than the current rate AND the measured Buffer Low Percentage exceeds a Step Down Threshold (as described below), reduce the current rate; (changing at a time when the buffer is already empty is advantageous as the sound card is not playing anything and it may be necessary to reconfigure it if the audio sampling rate, stereo–mono setting or bit width (number of bits per sample) has changed).

b) if the measured rate exceeds not only the current rate but also the next higher rate for a given period of time (e.g. 120 seconds: this could if desired be made adjustable by the user) increase the current rate

Ex. 1004 Leaning 8:17-26

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’772 Patent, 1[D]

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, wherein the set of one or more factors relate to the performance of the network; and

Leaning

The initiation of a rate change is triggered:

a) if the buffer ever empties AND the measured rate is less than the current rate AND the measured Buffer Low Percentage exceeds a Step Down Threshold (as described below), reduce the current rate; (changing at a time when the buffer is already empty is advantageous as the sound card is not playing anything and it may be necessary to reconfigure it if the audio sampling rate, stereo–mono setting or bit width (number of bits per sample) has changed).

b) if the measured rate exceeds not only the current rate but also the next higher rate for a given period of time (e.g. 120 seconds: this could if desired be made adjustable by the user) increase the current rate

Ex. 1004 Leaning 8:17-26

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’772 Patent, 1[E]

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; and

Leaning

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.

Ex. 1004 Leaning 15:3-8

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’772 Patent, 1[F]

1[F] presenting the video by playing back with the media player on the end user station the requested files in order of ascending playback time.

Leaning

According to one aspect of the invention there is provided a terminal for playing audio or video material which is stored on a remote server as a set of files representing successive temporal portions of the said material, the terminal comprising:

a telecommunications interface for communication with the server;

a buffer for receiving the files from the telecommunications interface;

means for playing the contents of the buffer; and

control means responsive to the state of the buffer to generate request messages for further files for replenishment of the buffer.

Ex. 1004 Leaning 1:13-19

number of frames. In the case of rate switching, it is, if not actually essential, highly desirable that the sub-file boundaries are the same for each rate, so that the first sub-file received for a new rate continues from the same point in the recording that the last sub-file at the old rate ended. To

Ex. 1004 Leaning 12:16-18

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