

UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE PATENT TRIAL AND APPEAL BOARD

STINGRAY GROUP INC. and STINGRAY MUSIC USA, INC.
Petitioners,

v.

EDWIN A. HERNANDEZ-MONDRAGON,
Patent Owner.

Case No. IPR2025-00351
U.S. Patent No. 11,140,441

**PETITION FOR *INTER PARTES* REVIEW
OF U.S. PATENT NO. 11,140,441**

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PETITIONERS' EXHIBIT LIST

EX. NO.	DESCRIPTION
Ex-1001	U.S. Patent No. 11,140,441
Ex-1002	Declaration of Mr. Stuart Lipoff
Ex-1003	U.S. Patent No. 7,940,303 to Farber, et al. ("Farber")
Ex-1004	U.S. Patent No. 8,954,600 to Avellan, et al. ("Avellan")
Ex-1005	U.S. Patent No. 9,009,111 to Vermeulen, et al. ("Vermeulen")
Ex-1006	U.S. Patent No. 8,442,110 to Pavlovskaia, et al. ("Pavlovskaia")
Ex-1007	WIPO International Publication Number WO 2010/044926 to Pavlovskaia, et al. ("Pavlovskaia-PCT")
Ex-1008	U.S. Patent No. 8,676,822 to Davis ("Davis")
Ex-1009	U.S. Patent Application Publication No. 2012/0117569 to Fogel, et al. ("Fogel")
Ex-1010	U.S. Patent No. 8,819,043 to Durante, et al. ("Durante")
Ex-1011	U.S. Patent No. 9,635,075 to Ma, et al. ("Ma")
Ex-1012	U.S. Patent No. 6,463,445 to Suzuki, et al. ("Suzuki")
Ex-1013	U.S. Patent Application Publication No. 2004/0031052 to Wannamaker, et al. ("Wannamaker")
Ex-1014	U.S. Patent No. 9,331,967 to Gangadharan, et al. ("Gangadharan")
Ex-1015	Prosecution History of Application No. 15/538,911, which is now U.S. Patent No. 10,123,074
Ex-1016	Prosecution History of U.S. Patent No. 11,140,441

Listing of Challenged Claims

Element	Claim Language
Claim 1	
Preamble 1	A computer-implemented method comprising:
Element 1a	creating a plurality of multimedia assets at a caching unit, for each one of the plurality of multimedia assets;
Element 1b	determining that there is sufficient storage space for the multimedia asset at the caching unit;
Element 1c	generating a channel identifier for the multimedia asset;
Element 1d	retrieving from a cloud service a plurality of media files to be included in the multimedia asset including a media identifier for each one of the media files;
Element 1e	for each one of the media files, creating a custom hypertext transfer markup language (HTML) user interface that includes video;
Element 1f	encoding each of the media files and encapsulating them together using an MPEG transport stream format;
Element 1g	storing each one of the multimedia assets at the caching unit;
Element 1h	receiving a request at the caching unit for one of the multimedia assets from a broadcasting unit; and
Element 1i	responsive to receiving the request, the caching unit providing the multimedia asset to the broadcasting unit in the MPEG transport stream format.
Claim 2	
Element 2a	The method of claim 1, wherein receiving the requests for the multimedia assets comprising receiving the requests over a REST API, or wherein retrieving the plurality of media files is performed using a REST API.
Claim 3	
Element 3a	The method of claim 1, wherein creating the custom HTML user interface for each media file is performed using Javascript.
Claim 4	
Element 4a	The method of claim 1, wherein encoding each of the media files include encoding each of the media files at a specified bit rate.
Claim 5	
Element 5a	The method of claim 1, wherein encoding each of the media files include encoding each of the media files using a H.264 encoder.
Claim 6	
Element 6a	The method of claim 1, wherein the custom HTML user interfaces

Element	Claim Language
	are configured to be rendered using a Webkit browser.
Claim 7	
Element 7a	The method of claim 1, wherein the video for the custom HTML interfaces includes video taken from the media file.
Claim 8	
Element 8a	The method of claim 1, wherein encoding the media file is performed using an AC-3 file format for audio content in the media file.
Claim 9	
Element 9a	The method of claim 1, wherein the custom HTML user interfaces are configured so that multiple custom HTML user interfaces of the multimedia asset can be retrieved using a web rendering engine.
Claim 10	
Preamble 10	A computer-implemented method comprising:
Element 10a	virtualizing a system including a virtualized caching server, wherein the virtualized caching server performs:
Element 10b	receiving, from a content provider, a request for at least one media stream for playback on a broadcast media channel, wherein the at least one media stream includes a plurality of multimedia items of different types;
Element 10c	obtaining content corresponding to the plurality of multimedia items from at least one source offering the content in at least one first format;
Element 10d	rendering a web page by a browser using the content;
Element 10e	generating a temporal sequence of screen captures of the rendered web page, where each screen capture defines all the content of the web page at a given time, and at least two adjacent screen captures illustrate a dynamic change of at least a portion of the content over time;
Element 10f	assembling the at least one media stream using the temporal sequence of screen captures; and
Element 10g	providing the at least one media stream to the content provider for broadcast on the broadcast media channel.
Claim 11	
Element 11a	The method of claim 10, wherein the obtaining comprises: retrieving, for each of the plurality of multimedia items, at least one audio file corresponding to an audio component of the multimedia item and a plurality of screen captures corresponding to a video

Element	Claim Language
	component of the multimedia item.
Claim 12	
Element 12a	The method of claim 11, wherein the generating comprises: combining the plurality of screen captures and the at least one audio file to create each of the plurality of multimedia items.
Claim 13	
Element 13a	The method of claim 12, further comprising: the virtualized caching server detecting a change at the at least one webpage corresponding to at least one of the plurality of multimedia items;
Element 13b	in response to detecting the change, retrieving a new plurality of screen captures from the at least one webpage for the at least one of the plurality of multimedia items; and
Element 13c	reassembling the at least one of the plurality of multimedia items using the new plurality of screen captures to yield an updated multimedia item.
Claim 14	
Element 14a	The method of claim 11, wherein the retrieving of the plurality of screen captures comprises obtaining the plurality of screen captures from a playback of a video on the at least one webpage.
Claim 15	
Element 15a	The method of claim 14, wherein the combining of the plurality of screen captures comprises metadata corresponding to at least one of a song title, an artist, and a music genre.
Claim 16	
Element 16a	The method of claim 10, further comprising: the virtualized caching server identifying the at least one webpage based on a channel identifier associated with the broadcast media channel.
Claim 17	
Element 17a	The method of claim 10, further comprising: the virtualized server querying the content provider to determine the second format, wherein the second format corresponds to a Moving Picture Experts Group (MPEG) format.
Claim 18	
Element 18a	The method of claim 10, wherein the content provider is a cable television operator or a satellite television operator.
Claim 19	
Element 19a	The method of claim 10, wherein providing the at least one media stream to the content provider comprises streaming the at least one

Element	Claim Language
	media stream to an MPEG multiplexer associated with the content provider.
Claim 20	
Element 20a	The method of claim 10, further comprising: the virtualized caching server provisioning, on at least one server, at least one virtual machine for performing the receiving, obtaining, generating, assembling, and providing.
Claim 21	
Element 21a	The method of claim 10, wherein virtualizing the system is performed using one of Docket, Xenserver, or a virtual machine.
Claim 22	
Element 22a	The method of claim 10, wherein virtualizing the system includes virtualizing the system to include at least one virtualized multicasting server that perform the providing the at least one media stream to the content provider.
Claim 23	
Element 23a	The method of claim 10, wherein virtualizing the system is performed for one channel, wherein the virtualized caching server is operable for one channel, wherein virtualizing the system is repeated for each one of a plurality of other channels.
Claim 24	
Element 24a	The method of claim 10, wherein receiving the request is performed using a JSON API.
Claim 25	
Preamble 25	A computer-implemented method comprising:
Element 25a	receiving, from a content provider, a request for at least one media stream for playback on a broadcast media channel, wherein the at least one media stream includes a plurality of multimedia items of different types;
Element 25b	obtaining content corresponding to the plurality of multimedia items from at least one source offering the content in at least one first format, performed over a first TCP-IP socket of a caching unit;
Element 25c	rendering a web page by a browser using the content;
Element 25d	generating a temporal sequence of screen captures of the rendered web page, where each screen capture defines all the content of the web page at a given time, and at least two adjacent screen captures illustrate a dynamic change of at least a portion of the content over time;

Element	Claim Language
Element 25e	assembling the at least one media stream using the temporal sequence of screen captures;
Element 25f	providing the at least one media stream to the content provider for broadcast on the broadcast media channel; and
Element 25g	providing, at a second TCP/IP socket of the caching unit, a status of the obtaining, generating, and assembling.
Claim 26	
Preamble 26	A computer-implemented method comprising at a caching unit:
Element 26a	receiving, from a content provider, a request for at least one media stream for playback on a broadcast media channel, wherein the at least one media stream includes a plurality of multimedia items of different types;
Element 26b	obtaining content corresponding to the plurality of multimedia items from at least one source offering the content in at least one first format;
Element 26c	rendering a web page by a browser using the content;
Element 26d	generating a temporal sequence of screen captures of the rendered web page, where each screen capture defines all the content of the web page at a given time, and at least two adjacent screen captures illustrate a dynamic change of at least a portion of the content over time;
Element 26e	assembling the at least one media stream using the temporal sequence of screen captures;
Element 26f	at a multicasting unit that is operable connected to the caching unit: providing the at least one media stream to the content provider for broadcast on the broadcast media channel;
Element 26g	recording the media stream from the caching unit to produce a recorded media stream; and
Element 26h	upon a fault being detected at the caching unit, providing at least a portion of the recorded media stream to the content provider.

I. INTRODUCTION

Under 35 U.S.C. § 311, Petitioners Stingray Group Inc. and Stingray Music USA, Inc. request *inter partes* review (“IPR”) of claims 1-26 (“Challenged Claims”) of U.S. Patent No. 11,140,441 (“the ’441 Patent,” Ex-1001).

The ’441 Patent is directed toward broadcasting multimedia content—such as live streaming television, movies, and music channels—and the Challenged Claims generally disclose assembling media content into multimedia streams for delivery. Claim 1 includes creating custom HTML user interfaces for a plurality of media files and encapsulating them together in an MPEG transport stream. Independent Claims 10, 25 and 26 are directed to rendering a webpage with a browser, generating a temporal sequence of screen captures, and then assembling those screen captures into a media stream.

As detailed below, the Challenged Claims were all disclosed in the art before the ’441 Patent’s alleged priority date.¹ For example, in relation to Claim 1, the ’441 Patent states that “a customizable user interface (UI) can be added to the output video MPEG transport stream” for each channel and “may include artist name, title of song, or any other information.” Ex-1001 at 5:59-67 and 11:64-67.

¹ The Patent-at-Issue claims priority to a provisional application filed on December 22, 2014. Petitioners rely on this priority date for purposes of this Petition without conceding that any claim is actually entitled to that earlier date.

However, Farber discloses “transmitting various music channel broadcasts over a network” with a user interface—see Figure 1 below—that includes information such as the “channel name” [red box], “album art” [blue box], and “title track label and artist” [green box] for the song currently playing. Ex-1003 at 5:2-12. As with the ’441 Patent, the user interfaces are written “utilizing HTML” and then encoded into an MPEG video frame that is multiplexed with audio data to form an MPEG transport stream. Ex-1003 at 5:50-54 and 6:2-25.

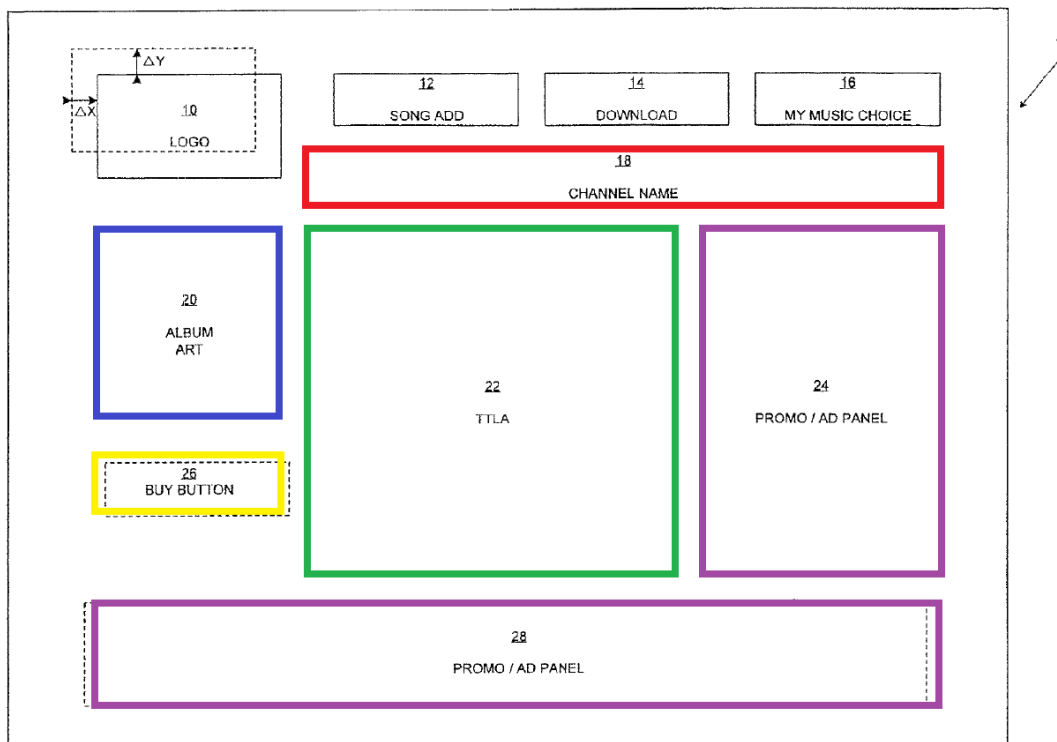


Fig. 1

Ex-1003 at Fig. 1.

Similarly, Independent Claims 10, 25 and 26 recite rendering a web page, generating a temporal sequence of screen captures, and then assembling those

screen captures into a media stream. During prosecution of a parent application—U.S. Patent App. No. 15/538,911—the Applicant overcame the Examiner’s rejection by adding those requirements, calling them “an important distinction between the claimed solution and the cited references.” Ex-1015 at 62-69. However, these key elements are explicitly found in Avellan.

Like the ’441 Patent, Avellan discloses “a number of broadcast channels,” where “each channel can have a specific theme, *such as country music*, military televisions, etc.” Ex-1004 at 8:24-27.² To generate each channel, the gateway server includes “browser software” that can “resolve and render pages, images, and documents,” including pages obtained from sources like “Netflix,” “YouTube” and “CNN.” Ex-1004 at 4:56-65 and Fig. 1. “The gateway server 134 then images those web pages (which are typically in an HTTP format) to a video or image frame format” and then “transmits that data to the multiple user computers 104.” Ex-1004 at 4:65-67 and 8:42-56.

With respect to “generating a temporal sequence of screen captures,” Avellan recognizes that “web pages often have information which is rendered over a period of time, such as a video, streaming information, or an animated display.” Ex-1004 at 5:5-5:7. “Accordingly, the gateway server 134 *continuously captures images of the web page* until it detects a repeating pattern of the information in the

² Unless otherwise stated, all emphases are added.

web page.” Ex-1004 at 5:7-5:10. Indeed, Avellan states that “suitable sites for the broadcast mode are news sites like CNN, BBC, newspaper, *live streaming television feeds, movies, music downloads*, or ESPN.” Ex-1004 at 8:18-21.

Accordingly, Petitioners respectfully request institution of this Petition and a finding that the Challenged Claims are unpatentable under (post-AIA) 35 U.S.C. §§ 102 and/or 103.

II. MANDATORY NOTICES

Pursuant to 37 C.F.R. §42.8(a)(1), Petitioners provide the following mandatory disclosures.

A. Real Parties-in-Interest (37 C.F.R. §42.8(b)(1))

Stingray Group Inc. and its subsidiary Stingray Music USA, Inc. (collectively “Stingray” or “Petitioners”) certify that they are the real parties-in-interest. No other party has directed, funded, or controlled Petitioners’ filing of this Petition, and this Petition was not filed at the behest of any other party.

B. Related Matters (37 C.F.R. § 42.8(b)(2))

Edwin A. Hernandez-Mondragon is the current assignee of record for the ’441 Patent. In a related litigation, Edwin A. Hernandez-Mondragon has represented that he “is the owner of all rights, title and interests to the ’441 Patent.” In the same litigation, he also represents that his company, EGLA Corp., “has an exclusive license to the technologies owned by Dr. Hernandez.” As of the filing

date of this Petition, Petitioners are aware that Patent Owner is presently asserting the '441 Patent in the following litigation:

- *Hernandez, et al. v. Stingray Group Inc., et al.*,

Case No. 1:24-cv-21226 (S.D. Fla. Apr. 2, 2024).

Petitioners are not aware of any other litigation or any other board proceedings involving the '441 Patent.

Petitioners are not aware of any other litigation or any other board proceedings involving the '441 Patent. The '441 Patent is related to both U.S. Patent No. 10,123,074 and U.S. Patent No. 10,524,002. Petitioners are currently challenging all claims of U.S. Patent No. 10,123,074 in IPR2025-00349 and all claims of U.S. Patent No. 10,524,002 in IPR2025-00350.

C. Lead and Back-up Counsel (37 C.F.R. § 42.8(b)(3))

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D. Service Information (37 C.F.R. § 42.8(b)(4))

Petitioners may be served paper copies as specified above. Petitioners consent to electronic service at the following email addresses:

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III. CERTIFICATION OF GROUNDS FOR STANDING

Petitioners certify pursuant to 37 C.F.R. §42.104(a) and §41.101 that the '441 Patent is eligible for *inter partes* review and Petitioners are not barred or estopped from requesting an *inter partes* review challenging the patent claims on the grounds identified in this Petition.

IV. STATEMENT OF PRECISE RELIEF REQUESTED

A. Claims for Which Review Is Requested (37 C.F.R. § 42.104 (b)(1))

Petitioners request *inter partes* review and cancellation of Challenged Claims 1–26 of the '441 Patent under 35 U.S.C. § 311 based on the following prior art references and grounds.

B. Statutory Grounds of Challenge (37 C.F.R. § 42.104 (b)(2))

This Petition relies on the following prior art references:

Exhibit	Cited Prior Art Reference
Ex-1003	U.S. Patent No. 7,940,303 to Farber, et al. (“Farber”), which was filed on November 12, 2009, making it prior art under at least 35 U.S.C. §102(a)(2).
Ex-1004	U.S. Patent No. 8,954,600 to Avellan, et al. (“Avellan”), which was filed on March 2, 2012, making it prior art under at least 35 U.S.C. §102(a)(2).
Ex-1005	U.S. Patent No. 9,009,111 to Vermeulen, et al. (“Vermeulen”), which was filed on May 14, 2012, making it prior art under at least 35 U.S.C. §102(a)(2).
Ex-1006	U.S. Patent No. 8,442,110 to Pavlovskaja, et al. (“Pavlovskaja”),

Exhibit	Cited Prior Art Reference
	which was filed on October 9, 2008, making it prior art under at least 35 U.S.C. §102(a)(2).
Ex-1007	WIPO International Publication Number WO 2010/044926 to Pavlovskaja, et al. (“Pavlovskaja-PCT”), which was published on April 22, 2010, making it prior art under at least 35 U.S.C. §102(a)(1).
Ex-1008	U.S. Patent No. 8,676,822 to Davis (“Davis”), which was filed on February 6, 2009, making it prior art under at least 35 U.S.C. §102(a)(2).
Ex-1009	U.S. Patent Application Publication No. 2012/0117569 to Fogel, et al. (“Fogel”), which was published on May 10, 2012, making it prior art under at least 35 U.S.C. §102(a)(1).
Ex-1010	U.S. Patent No. 8,819,043 to Durante, et al. (“Durante”), which was filed on November 9, 2010, making it prior art under at least 35 U.S.C. §102(a)(2).
Ex-1011	U.S. Patent No. 9,635,075 to Ma, et al. (“Ma”), which was filed on March 8, 2010, making it prior art under at least 35 U.S.C. §102(a)(2).
Ex-1012	U.S. Patent No. 6,463,445 to Suzuki, et al. (“Suzuki”), which was filed on September 30, 1999, making it prior art under at least 35 U.S.C. §102(a)(2).
Ex-1013	U.S. Patent Application Publication No. 2004/0031052 to Wannamaker, et al. (“Wannamaker”), which was published on February 12, 2004, making it prior art under at least 35 U.S.C. §102(a)(1).
Ex-1014	U.S. Patent No. 9,331,967 to Gangadharan, et al. (“Gangadharan”), which was filed on October 31, 2013, making it prior art under at least 35 U.S.C. §102(a)(2).

The specific statutory grounds for challenge are:

Ground	Cited Prior Art References	Basis	Claim(s) Challenged
1	Farber	§102	1, 7
2	Farber and Vermeulen	§103	1, 2
3	Farber and Pavlovskaja	§103	3
4	Farber and Davis	§103	4, 5, 8
5	Farber and Fogel	§103	6, 9
6	Avellan and Pavlovskaja-PCT	§103	10-16 and 18-23

Ground	Cited Prior Art References	Basis	Claim(s) Challenged
7	Avellan, Pavlovskaia-PCT and Durante	§103	15
8	Avellan, Pavlovskaia-PCT and Ma	§103	16
9	Avellan, Pavlovskaia-PCT and Suzuki	§103	17
11	Avellan, Pavlovskaia-PCT and Gangadharan	§103	24
12	Avellan and Wannamaker	§103	25
12	Avellan	§102	26
13	Avellan and Wannamaker	§103	26

C. Discretionary Denial is Not Warranted

Petitioners respectfully submit that the Board should not exercise its discretion under 35 U.S.C. §§ 314(a) or 325(d) to deny this Petition. All grounds are based on prior art references that were never considered during prosecution and that explicitly disclose elements that the Patent Owner contended during prosecution were “an important distinction” over the prior art. Additionally, the related district court case is still at an early stage and Petitioners intend to move for a stay of that litigation pending this Petition. Therefore, Petitioners respectfully submit that discretionary denial is not warranted.

V. SUMMARY OF THE '441 PATENT

The '441 Patent is directed toward broadcasting multimedia content—including live streaming television, movies, and music channels—and the assembling of that content into media streams. Claim 1 focuses on the creation of custom HTML user interfaces for a plurality of media files that are encapsulated

into an MPEG transport stream. Independent Claims 10, 25 and 26 focus on rendering a webpage with a browser, generating a temporal sequence of screen captures, and then assembling those screen captures into a media stream. For the latter set of claims, Patent Owner represented to the Examiner during prosecution of the related '074 Patent that the rendering and screen capture elements were “an important distinction” over the cited prior art. Ex-1015 at 62-69.

With respect to the “user interface” and “rendering” language, the '441 Patent explains that a “custom UI can include JavaScript, CSS, and HTML content files that can be rendered using a browser using WebKit (e.g. PhantomJS or Safari) or any other browser-rendering engine compatible with HTML4/5 or any future HTML version.” Ex-1001 at 7:5-7:9.

With respect to the “screen capture” language, the '441 Patent states that “rendered images from a web service can be used to create overlapping video or replace any video in the video feed file.” *Id.* at 7:10-12. Specifically, “one or more screens will be retrieved from the rendering engine” and captured “using a tool similar to PhantomJS (Webkit-based headless engine for rendering images) or QtCapture, or simply capturing screen frame buffers from a machine running any software tool.” *Id.* at 7:19-26. “Once all screens and video are captured, the resulting output created can be a video file that then is either replaced or merged (multiplexed) with the original file.” *Id.* at 7:29-32. “The multiplexing can be done

using tools such as FFMPEG or VLC or any proprietary tool that can multiplex audio and video files into a resulting MPEG Transport Stream (or MPEG-4 output, or any similar output).” *Id.* at 7:44-48 and 7:37-39.

Thus, the ’441 Patent is directed to using commonly-known third-party tools, such as PhantomJS, Safari and QtCapture. Ex-1002, ¶¶76-83. Similarly, the screen captures generated through this process can be multiplexed using commonly-known tools like FFMPEG or VLC. Ex-1002, ¶¶76-83. Even rendering HTML and the use of the MPEG Transport Stream format were commonly known prior to the filing date of the ’441 Patent. Ex-1002, ¶¶76-83.

VI. LEVEL OF ORDINARY SKILL IN THE ART

The level of ordinary skill in the art may be reflected by the prior art of record. *See Okajima v. Bourdeau*, 261 F.3d 1350, 1355 (Fed. Cir. 2001). Here, a Person of Ordinary Skill in the Art (“POSITA”) at the time of the claimed invention would have a bachelor’s or equivalent degree in computer science or a related field and at least 2 years of experience in multimedia processing or delivery using internet protocols. Furthermore, a person with less formal education but more experience, or more formal education but less experience, could have also met the relevant standard for a POSITA. Ex-1002, ¶¶67-68.

VII. CLAIM CONSTRUCTION (37 C.F.R. § 42.104(b)(3))

For IPR proceedings, the Board applies the claim construction standard set forth in *Phillips v. AWH Corp.*, 415 F.3d 1303 (Fed. Cir. 2005) (*en banc*). Under *Phillips*, Claim terms are typically given their ordinary and customary meanings, as would have been understood by a POSITA, at the time of the invention, having taken into consideration the language of the claims, the specification, and the prosecution history of record. *Phillips*, 415 F.3d at 1313. The Board, however, only construes the claims when necessary to resolve the underlying controversy. *Toyota Motor Corp. v. Cellport Systems, Inc.*, IPR2015-00633, Paper 11 at 16 (PTAB Aug. 14, 2015). Petitioners respectfully submit that the Board need not expressly construe any terms because the prior art invalidates the Challenged Claims under any plausible construction.

VIII. THE CHALLENGED CLAIMS ARE UNPATENTABLE**A. Ground 1: Claims 1 and 7 are anticipated by Farber.****a. Claim 1****Preamble 1**

Preamble 1	A computer-implemented method, comprising:
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To the extent limiting, Farber teaches Preamble 1.

Farber discloses an “audio broadcast system” that is “designed for transmitting various music channel broadcasts over a network such as a cable

television network or a satellite network for distribution to a plurality of subscribers.” Ex-1003 at 5:9-12. This system can be implemented on “a personal or general-purpose computer.” Ex-1003 at 8:12-13.

Element 1a

Element 1a	creating a plurality of multimedia assets at a caching unit, for each one of the plurality of multimedia assets:
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Farber teaches Element 1a.

In Farber, each music channel includes both audio data, such as a music track, and an accompanying user interface (see Figure 1 below) that displays information, such as the “channel name 18 [red box], album art 20 [blue box], title track label and artist information 22 [green box], promotional/advertising panels 24, 28 [purple boxes] and a buy button 26 [yellow box].” Ex-1003 at 3:38-44.

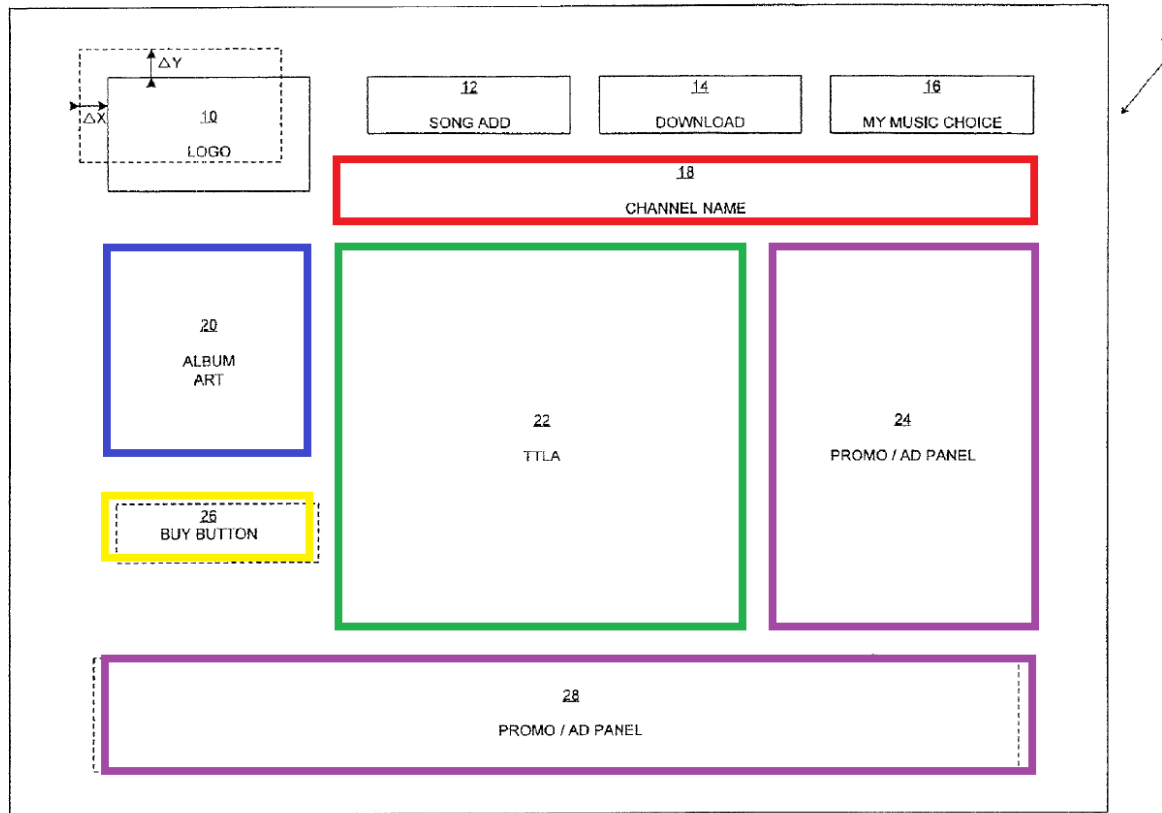


Fig. 1

Ex-1003 at Fig. 1 and 5:50-54 (stating that the user interface “may be coded utilizing HTML”).

In Figure 4 below, “the encoder 47 [blue box] pulls template information, images, and text from the data carousel subsystem 46 [red box] and creates, based on the template information, a screen having embedded assets such as those shown in screens 1, 2 or 3 which are associated with the currently queued song.” Ex-1003 at 6:3-7. “The MPEG encoder 47 then creates an MPEG transport stream for all channels with the embedded MPEG video frames.” Ex-1003 at 6:7-8.

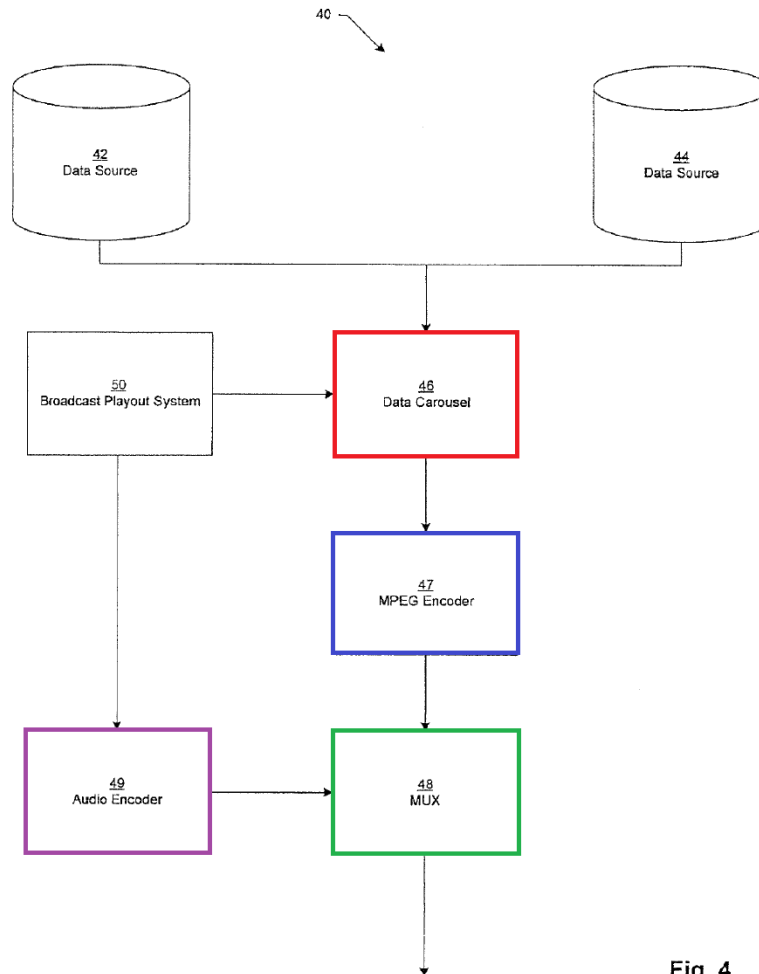


Fig. 4

Ex-1003 at Fig. 4. “The multiplexer 48 [green box] serves to combine the audio feed from the audio encoder 49 [purple box] and the associated encoded MPEG transport stream from the MPEG encoder 47.” Ex-1003 at 6:18-21. “The multiplexer 48 then feeds the multiplexed signal out for broadcast in the form of a video transport stream to a distribution system,” such as “a cable television network or a satellite network provider.” Ex-1003 at 6:21-25.

The elements of Claim 1 recite that a “multimedia asset” is associated with a “channel identifier” and includes a “plurality of media files” that are encoded and

encapsulated together in an “MPEG transport stream” and stored “at the caching unit.” Ex-1001 at 14:58-67. In response to a request, “the caching unit provide[s] the multimedia asset to the broadcasting unit in the MPEG transport stream format.” Ex-1001 at 15:5-7. In connection with Claim 1, the ’441 Patent states:

As the caching unit may handle multiple channels of different types and name, each channel can have a unique identifier corresponding to the name of the playlist. For example channel name “Cool” or “Rock” 410 are names that can identify the channel to be retrieved from the caching server.

Ex-1001 at 6:20-25.

Thus, Farber’s disclosure of a “music channel” that includes encoded audio data and corresponding MPEG video frames for the queued song/channel discloses a “multimedia asset.” As detailed below, each music channel is associated with a “channel identifier” and includes a “plurality of media files”—such as songs, album artwork and video assets—that are encoded in an “MPEG transport stream” and cached for subsequent playback. This process “may be executed for a *plurality of channels* simultaneously.” Ex-1003 at 6:9-10. Accordingly, Farber discloses “creating a plurality of multimedia assets at a caching unit,” and “for each one of the plurality of multimedia assets” Farber further discloses the elements below.

Element 1b

Element 1b	determining that there is sufficient storage space for the
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	multimedia asset at the caching unit;
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Farber teaches Element 1b.

Farber states that “in applications where playout is desired at a later time, the storage/playout device 150 may be implemented utilizing a recorder for creating or writing to any suitable storage medium such as DVD, CD ROM, hard disk, or any other suitable read only or rewritable storage medium.” Ex-1003 at 7:62-8:3.

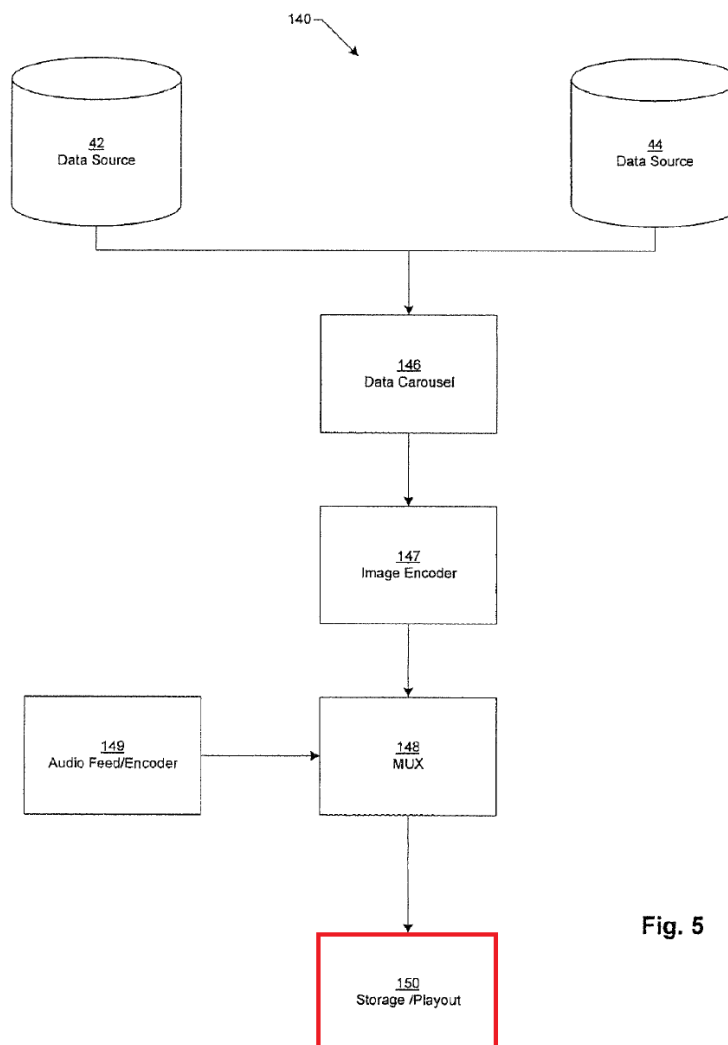


Fig. 5

Ex-1003 at Fig. 5.

POSITAs would recognize that the successful payout of the requested media stream is a “determin[ation] that there is sufficient storage space” for the multimedia asset at the caching unit. Ex-1002, ¶126. In other words, by retrieving “at a later time” the stored data, there must have been sufficient storage space for that data. Ex-1002, ¶126.

Element 1b, on its face, *does not* require this determination to be made *before* storing the multimedia asset, nor does it require a determination of a specific *amount* of available space. Similarly, Element 1b also *does not* specify the form that this “determination” step takes or require any subsequent action in response. Because successfully storing and retrieving a multimedia asset satisfies the plain and ordinary language of Element 1b, POSITAs would recognize that Farber inherently teaches Element 1b. Ex-1002, ¶126.

However, to the extent Farber does not disclose Element 1b, it would have been obvious to combine Farber’s system with Vermeulen, which teaches determining whether there is available space in storage, as discussed in Ground 2.

Element 1c

Element 1c	generating a channel identifier for the multimedia asset;
-------------------	---

Farber teaches Element 1c.

Figure 6 of Farber shows the markup language for an example user interface that would accompany Elton John's song "Are You Ready for Love," which includes identifiers for channel name "Soft Rock" and channel number "001".

```
<?xml version="1.0"?>
<!DOCTYPE Scrn SYSTEM "file:///data/mc/MusicChoice.dtd">
<Scrn hgt="480" wid="704"
  chan="001" chName="Soft Rock" Seq="02262">
  <IntWin xPos="200" yPos="90" xSz="390" ySz="236"
    BgCl="0x1E1E1E" FgCl="0xC4C3C8" InCl="0xB71E16"
    BgSl="0xB71E16" BtSl="0xB71E16" BdSl="0xC8C800" />
```

Ex-1003 at Fig. 6. Farber discloses that "[t]he screen tag may include a number of attributes, including . . . channel ('chan'), which *may be used to identify the name of the broadcast music channel with which the template data is associated.*" Ex-1003 at 6:36-44. Farber further states that "first data source 42 may contain, for example, information to support the channel name asset 18 and may include a song identification database, which contains playlist information, which is programmed by genre or channel for a given type of music." Ex-1003 at 5:18-22.

As with Farber's disclosure of channel names/numbers associated with "a given type of music"—i.e., "Soft Rock"—the '441 Patent similarly describes "a channel identifier that is associated with a particular category of multimedia items, such as a music genre corresponding to rock, classical, jazz, etc." Ex-1001 at 7:54-59 and 6:23-25 (stating that the "channel name 'Cool' or 'Rock' 410 are names that can identify the channel to be retrieved from the caching server"). The '441 Patent also describes "indexes or identifiers by the name 'ChID'," which are

“integers preferably no more than an integer value from 1 to the maximum number of channels.” Ex-1001 at 6:52-54. Accordingly, Farber’s disclosure of channel names (like “Soft Rock”) and numbers satisfies Element 1c.

Element 1d

Element 1d	retrieving from a cloud service a plurality of media files to be included in the multimedia asset including a media identifier for each one of the media files;
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Farber teaches Element 1d.

First, Farber discloses retrieving a plurality of media files to be included in the multimedia asset including a media identifier for each one of the media files. Farber discloses each audio broadcast channel includes a plurality of audio works. For example, Farber states the user interfaces “may change . . . at the beginning of *each new song being broadcast.*” Ex-1003 at 4:33-36. For each song, “[t]he broadcast playout system 50 sends audio content (e.g., an audio work), such as a queued song, to the audio encoder 49.” Ex-1003 at 5:63-67 and 7:43-45 (stating that “[a]n audio feed or audio encoder 149 supplies audio which is associated with the video frame output of the image encoder 147”).

For each song, Farber also retrieves an album cover, such as the “.jpg” file for “Elton John’s Greatest Hits 1970-2002” album listed in Figure 6.

```
| pos="2" />  
| <Grobject src="mcAA1730327.jpg" desc="Elton John's Greatest  
| Hits 1970-2002"  
| xPos="501" yPos="338" xSz="100" ySz="100" wid="100" hgt="100"  
| pos="3" />  
| <Grobject src="mcBA506412.jpg" Billable="N"
```

Ex-1003 at Fig. 6. As taught in Farber, “[t]he logo and album art assets 10, 20 contain graphical content” and “data source 44 may include, for example, information to support the album art asset.” Ex-1003 at 3:45-46, 5:26-27 and 2:27-36 (stating that the displayed content includes “an image of the album cover”). Similarly, for each song, “[t]he promotional/advertising panels 24, 28 may contain a combination of graphic and textual content and may alternatively contain motion picture video content.” Ex-1003 at 3:48-51.

Farber also discloses retrieving a media identifier for each media file. “[A] data carousel subsystem 46 retrieves data from one or a plurality of data sources 42, 44.” Ex-1003 at 5:16-17. Farber teaches that “second data source 44 may include, for example, *information to support the album art asset 20, the title and track label and artist asset 22, and information to support other assets.*” Ex-1003 at 5:26-29. In Figure 6, information identifying the song’s title, artist, album, and an associated Unique ID (“UniqID value=‘3310722’”) was obtained.

```

<Grobject
  xPos="214" yPos="92" xSz="214" ySz="251" wid="214" hgt="251"
  pos="1" >
  <SongTitle value="Are You Ready For Love (2003)"/>
  <Artist value="Elton John"/>
  <RecordLabel value="ULTRA"/>
  <CD value="Elton John's Greatest Hits 1970-2002"/>
  <UniqID value="3310722"/>
</Grobject>
<Grobject src="mcBT_BuyPrevious_1.jpg" desc="Buy Previous Button"
  xPos="209" yPos="314" xSz="129" ySz="37" wid="129" hgt="37"
  pos="2" />
<Grobject src="mcAA1730327.jpg" desc="Elton John's Greatest
  Hits 1970-2002"
  xPos="501" yPos="338" xSz="100" ySz="100" wid="100" hgt="100"
  pos="3" />
<Grobject src="mcBA506412.jpg" Billable="N"
  xPos="336" yPos="128" xSz="320" ySz="192" wid="320" hgt="192"
  pos="4" />

```

Ex-1003 at Fig. 6. Similarly, the retrieved album artwork “.jpg” file is accompanied by a description (“desc”) that identifies the artwork as corresponding to “Elton John’s Greatest Hits 970-2002” album.

The ’441 Patent similarly describes that “[e]ach new file synchronized with the Mediamply Cloud has a Media ID value which the cloud can assign and include additional metadata information such as ‘Artist’ and ‘Author’.” Ex-1001 at 9:11-14 and 11:40-41 (stating that the “program identifier” could be “as simple as a string containing Artist, Name, or other information”).

Second, Farber further teaches retrieving the media files and identifiers from a “cloud service.” Farber teaches that data sources “may be connected to or *in communication with* the data carousel subsystem 46” and “may or *may not be co-located* with the data carousel subsystem 46.” Ex-1003 at 5:5:33-38 and 5:29-30

(stating that a data source “may be associated with and connected to a server or other computer”). POSITAs would understand this to mean that the data sources can be cloud-based and accessed over a network. Ex-1002, ¶127.

Element 1e

Element 1e	for each one of the media files, creating a custom hypertext transfer markup language (HTML) user interface that includes video;
-------------------	--

Farber teaches Element 1e.

First, for each media file, Farber discloses a custom user interface associated with the queued song. Figure 1 shows a user interface that is “displayed coincident with the transmission of a broadcast music channel.” Ex-1003 at 3:38-39. Farber states the described “screen arrangements may change . . . at the beginning of each new song being broadcast.” Ex-1003 at 4:33-36. Specifically, for each song, “the encoder 47 pulls template information, images, and text from the data carousel subsystem 46 and creates, based on the template information, a screen having embedded assets such as those shown in screens 1, 2 or 3, ***which are associated with the currently queued song.***” Ex-1003 at 6:2-7.

For example, “screen 1 contains various assets including a logo 10, a song add button 12, a download button 4, a personalized channel choice button 16, a channel name 18, ***album art 20, title track label and artist information 22,*** promotional/advertising panels 24, 28 and a buy button 26.” Ex-1003 at 3:39-44.

The control buttons “allow[] the user to make a selection” and can be used to “create a personalized music channel, to indicate music preferences of the user, to download a selected song, or to buy a selected album or track.” Ex-1003 at 3:54-64. Thus, each screen is a custom user interface.

Second, Farber states each interface “may be coded utilizing *HTML*, XML or other suitable protocols for creating templates/screens having text and other assets such as those described above.” Ex-1003 at 5:50-54. Mirroring Farber, the ’441 Patent states that “[t]he caching unit can add a ‘Custom UI,’ or a customizable User Interface that is designed using Hypertext Markup Language (e.g., HTML) or a web service.” Ex-1001 at 6:65-7:1 Accordingly, Farber discloses “custom hypertext transfer markup language (HTML) user interfaces.”

Third, Farber discloses that each interface also “includes video.” For example, Farber states “[t]he promotion/advertising panels 24, 28 [purple boxes] may contain a combination of graphical and textual content and *may alternatively contain motion picture video content*.” Ex-1003 at 3:48-51 and 3:30-33 (stating that each of the “graphic object” assets may also include “motion picture video”).

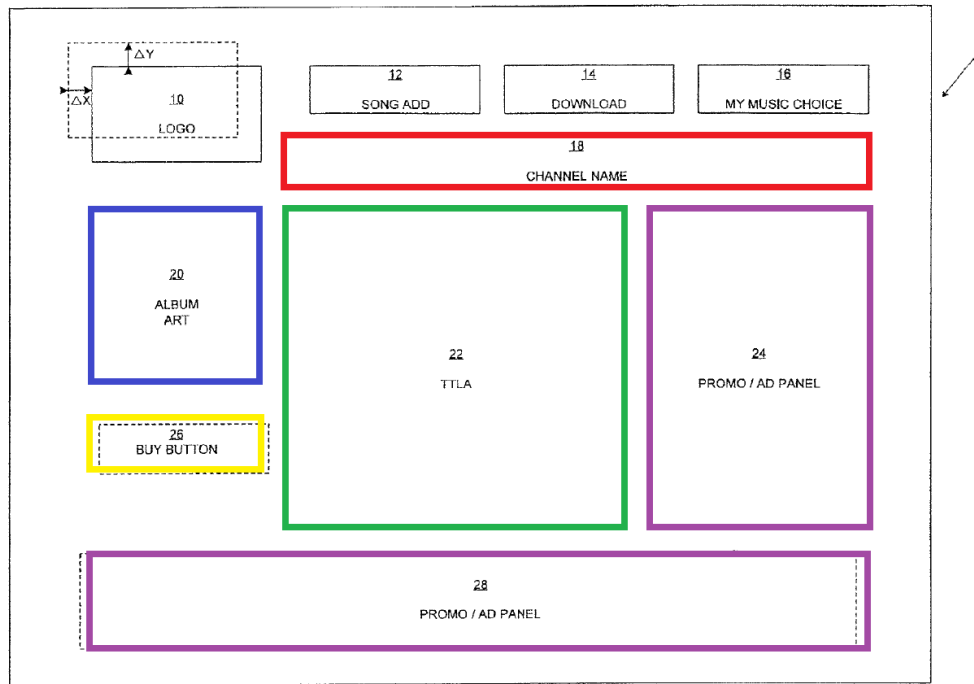


Fig. 1

Ex-1003 at Fig. 1.

Element 1f

Element 1f	encoding each of the media files and encapsulating them together using an MPEG transport stream format;
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Farber teaches Element 1f.

Farber discloses that “data carousel subsystem 46 generates a trigger to an encoder 47, which *may be an MPEG encoder*” and “[i]n response to the trigger, the encoder 47 pulls template information, images, and text from the data carousel subsystem 46 and creates, based on the template information, a screen having embedded assets such as those shown in screens 1, 2 or 3, which are associated with the currently queued song.” Ex-1003 at 6:2-7. The MPEG encoder 47 then

produces “a video frame such as an MPEG video frame.” Ex-1003 at 6:7-8. Similarly, “[a]n audio feed or audio encoder 149 supplies audio which is associated with the video frame output of the image encoder 147.” Ex-1003 at 7:43-45.

Farber teaches that the encoded media is then encapsulated together. “[M]ultiplexer 48 receives the MPEG transport stream from the MPEG encoder 47 and simultaneously receives an encoded audio feed from an audio encoder 49.” Ex-1003 at 6:15-18. “The multiplexer 48 serves to combine the audio feed from the audio encoder and the associated encoded MPEG transport stream from the MPEG encoder.” Ex-1003 at 6:18-21. “The multiplexer 48 then feeds the multiplexed signal out for broadcast in the form of a video transport stream to a distribution system” such as “a cable television network or a satellite network provider.” Ex-1003 at 6:21-25.

Element 1g

Element 1g	storing each one of the multimedia assets at the caching unit;
-------------------	--

Farber teaches Element 1g.

Referring to Figure 5 below, “multiplexer 148 [green box] serves to combine the audio feed/encoder output 149 with the image encoder output 147 to create a transport stream at its output.” Ex-1003 at 7:51-53. “The output of the multiplexer 148 is fed to a storage/playout device 150 [orange box].” Ex-1003 at 7:62-63.

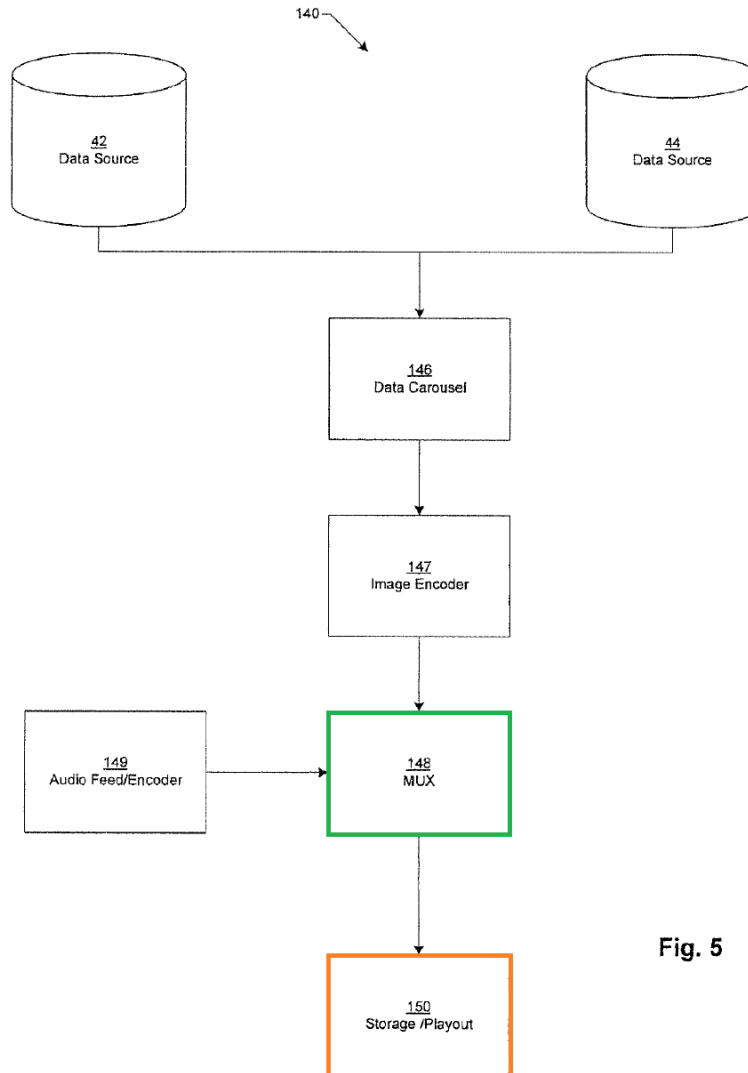


Fig. 5

Ex-1003 at Fig. 5. “[I]n applications where playout is desired at a later time, the storage/playout device 150 may be implemented utilizing a recorder for creating or writing to any suitable storage medium such as DVD, CD ROM, hard disk, or any other suitable read only or rewritable storage medium.” Ex-1003 at 7:62-8:3.

Accordingly, Element 1g is disclosed by Farber.

Element 1h

Element 1h	receiving a request at the caching unit for one of the multimedia
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	assets from a broadcasting unit; and
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Farber teaches Element 1h.

As discussed above, Farber discloses storing the transport stream for when playout is “desired at a later time.” Ex-1003 at 7:62-8:3. POSITAs would recognize that “desiring” playout “at a later time” inherently discloses “receiving a request” for that stored multimedia asset. Ex-1002, ¶128.

Similarly, POSITAs would recognize that such a request is received from the broadcasting unit. Ex-1002, ¶128. For example, referring to Figure 4, Farber states that “audio broadcast system 40 is designed for *transmitting various music channel broadcasts over a network* such as cable television network.” Ex-1003 at 6:21-25 and 5:9-12. And referring to Figure 5, Farber states “system 140 is capable of simultaneously *transmitting*, playing out, or *storing* such content for later playback *utilizing the methods disclosed above*.” Ex-1003 at 8:22-25.

However, to the extent Farber does not disclose Element 1h, it would have been obvious to combine Farber’s system with Vermeulen, which teaches receiving requests for stored multimedia, as discussed in Ground 2.

Element 1i

Element 1i	responsive to receiving the request, the caching unit providing the multimedia asset to the broadcasting unit in the MPEG transport stream format.
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Farber teaches Element 1i.

Farber teaches that “multiplexer 48 serves to combine the audio feed from the audio encoder and the associated encoded MPEG transport stream from the MPEG encoder” and then “feeds the multiplexed signal out for broadcast in the form of a video transport stream to a distribution system” such as “a cable television network or a satellite network provider.” Ex-1003 at 6:18-25 and 5:9-12 Referring to Figure 5, Farber states “system 140 is capable of simultaneously *transmitting*, playing out, or *storing* such content for later playback *utilizing the methods disclosed above.*” Ex-1003 at 8:22-25.

As detailed above, Farber discloses all elements of Claim 1.

b. Claim 7

Element 7a

Element 6a	The method of claim 1, wherein the video for the custom HTML interfaces includes video taken from the media file.
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Farber teaches Element 7a.

Farber’s custom HTML user interface includes various assets, including assets for the “channel name 18, album art 20, title track label and artist information 22, [and] promotional/advertising panels 24, 28.” Ex-1003 at 3:42-44. “These assets may include, but are not limited to, textual information, *motion picture video*, [or] graphics” and are “for the purpose of conveying information to the viewer either graphically, textually, or through video.” Ex-1003 at 3:30-31 and 3:552-54. Farber also states that “data source 44 may include, for example,

information to support” those assets, which would include video files for motion picture video assets. Thus, Farber teaches that video for the HTML interface can be taken from a motion picture video file.

B. Ground 2: Claims 1 and 2 are obvious in view of Farber and Vermeulen.

a. Claim 1

Element 1b

Element 1b	determining that there is sufficient storage space for the multimedia asset at the caching unit;
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Vermeulen discloses “nodepicker 130” which acts as “storage node selection logic.” Ex-1005 at 14:59-60. Prior to storing data, nodepicker 130 “develop[s] a write plan” and “ensure[s] that the write plan has a reasonable chance of succeeding—for example, that the nodes 160 specified in the write plan are in fact operational *and are expected to have sufficient storage resources available to accept the object.*” Ex-1005 at 14:65-15:8 and 7:2-3 (stating that data objects “may be allowed to scale in size subject only to the physical storage resources available to the storage service”).

POSITAs would have been motivated to combine Farber and Vermeulen because it is advantageous to check for available space in storage prior to storing data, such as Farber’s transport streams which can be stored when “playout is desired at a later time.” Ex-1003 at 7:62-8:3; Ex-1002, ¶130. POSITAs would

recognize that not checking for sufficient storage space could lead to system errors and storage failure, negatively impacting the user's experience when playback is later "desired" by the user. Ex-1002, ¶130.

POSITAs would have had a reasonable expectation of success in combining Farber with Vermeulen's disclosure of checking for available space because the process of checking storage space was well-known and commonly implemented in computer systems. Ex-1002, ¶131. Farber also states that its storage can be "any suitable storage medium such as DVD, CD ROM, hard disk, or any other suitable read only or rewritable storage medium," which are all forms of memory that POSITAs know how to evaluate for available space, and thus Vermeulen's nodepicker would be compatible with the system of Farber and not require any alteration to its operation. Ex-1002, ¶131.

Element 1h

Element 1h	receiving a request at the caching unit for one of the multimedia assets from a broadcasting unit; and
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Vermeulen teaches that "multimedia applications generate and use application data of various types and formats, such as . . . images, audio and video data, among others." Ex-1005 at 1:26-28. To store this data, Vermeulen discloses "a storage model for providing data storage to users as a service, such as a web service" that "may include a web services interface configured to receive,

according to a web services protocol, client requests for access to data objects.” Ex-1005 at 4:50-51 and 2:17-19.

POSITAs would have been motivated to combine Farber and Vermeulen because receiving a “request” for a stored stream when playback is “desired” is a simple solution for enabling retrieval of such data. Ex-1002, ¶133. POSITAs recognize that communicating such requests allow users to specify data for delivery, which improves user experience. Ex-1002, ¶133.

POSITAs would have had a reasonable expectation of success in combining Farber with Vermeulen’s disclosure of receiving requests because Farber already discloses a storage device specifically for playing data back “in applications where playout is desired at a later time.” Ex-1003 at 7:62-8:3; Ex-1002, ¶134. Implementing a routine to receive requests for such desired data was commonly-known in the art and is compatible with Farber’s system and would not require any alteration to its operation. Ex-1002, ¶134.

As a result, Farber in view of Vermeulen renders claim 1 obvious.

Additionally, to the extent Farber does not disclose, on its own, Elements 1b and/or 1h, the combination of Farber and Vermeulen above can be used with Grounds 3-5 below to further render obvious dependent claims 3-9.

b. Claim 2**Element 2a**

Element 2a	The method of claim 1, wherein receiving the requests for the multimedia assets comprising receiving the requests over a REST API, or wherein retrieving the plurality of media files is performed using a REST API.
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Vermeulen further discloses a “REST-style web services architecture.” Ex-1005 at 5:7-19. Vermeulen states that “in a Representational State Transfer (REST)-style web services architecture, the parameters that are pertinent to a web services call (e.g., specifying the type of service requested, user credentials, user data to be operated on, etc.) may be specified as parameters to the data transport command that invokes the web services call to the web services end-point, such as an HTTP GET or PUT command.” Ex-1005 at 5:9-15.

Similarly, the ’441 Patent states that a “web service that matches a REST interface (Representation State Transfer)” can be used and that requests can be made through “the HTTP GET request.” Ex-1001 at 6:16-18 and 7:1-5. Accordingly, Vermeulen discloses retrieving media files using a REST API.

POSITAs would have been motivated to combine Farber and Vermeulen because REST web services and APIs were a reliable method for communicating over a client-server architecture and used the commonly-known Hypertext Transfer Protocol (HTTP), which is the foundation for data communication over the internet. Ex-1002, ¶137. POSITAs would have also recognized that an advantage

to using a REST API is that it allows the implementation of the server and the implementation of the client to be independent, simplifying the process of handling requests for resources. Ex-1002, ¶137.

POSITAs also would have a reasonable expectation of success in implementing a REST API in Farber because it was common knowledge of how to implement REST APIs and use, for example, HTTP GET request to communicate resource requests and states between a client and server. Ex-1002, ¶138. Additionally, because a REST API, by definition, does not require a server to store information about a client (and client states and other parameters can be passed with the request), POSITAs recognize that REST APIs are easier to implement than other methods, such as a Simple Object Access Protocol model, and that a REST API could be readily-included in Farber without altering its operation. Ex-1002, ¶138.

As a result, Farber in view of Vermeulen renders claim 2 obvious.

C. Ground 3: Claim 3 is obvious in view of Farber and Pavlovskaja.

a. Claim 3

Element 3a

Element 3a	The method of claim 1, wherein creating the custom HTML user interface for each media file is performed using Javascript.
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Pavlovskaja discloses a “web content server” for delivery of multimedia channels. Ex-1006 at 3:5-7. “The web content server generates a set of browser

instances” that cycle through a “set of web pages.” Ex-1006 at 3:63-66. For example, “[b]rowser instance 108 cycles through a carousel of web page(s) which includes web page 100 which displays snow and slope conditions from the homepage of a ski resort selected by the content provider to be part of this channel, e.g., the ‘Snow Report’ channel 150.” Ex-1006 at 4:44-49. “For each new channel a corresponding master HTML page is defined” that controls the interface. Ex-1006 at 12:7-9 and 12:33-34. For example, the HTML page of Figure 5 includes a “floating frame element 508” and three functions 502, 504, 506 written in a script language for cycling the URLs in array 500 within the frame element 508.” Ex-1006 at 16:20-55.

```

<HTML><HEAD><SCRIPT language=JavaScript>
var AdURL=new Array(4); var MaxSite=3;
var adindex=0;
var scriptTimeout=2000;

(
  AdURL[0]="www.Ski_Area_1.html";
  AdURL[1]="www.Ski_Area_2.html";
  AdURL[2]="www.Ski_Area_3.html";
  AdURL[3]="www.Ski_Area_4.html";
)

500
502
function loadPage() {var offset; adindex=getSearchValue("ScriptIndex");
if (adindex=="") adindex=0; if (adindex>MaxSite) adindex=0;
ArctosScriptFrame.location=AdURL[adindex];
setTimecut("bumpNumber()", scriptTimeout);}

504
function bumpNumber() {adindex++; if (adindex>MaxSite) adindex=0;
if (location.search.length>0) {var RetStr=""; var searchStr=
"Scriptindex+"; var offset=0; var end =0; var len=0;
if (offset !=-1) {offset +=searchStr.length; end=
location.search.indexOf("&", offset);
if (end== -1) end = location.search.length; len=location.search.length;
RetStr = location.pathname + unescape(location.search.substring(0, offset)) +
adindex + unescape(location.search.substring(end, len));}

```

Ex-1006 at Fig. 5. Pavlovskaja states “[t]he *script language shown is JavaScript*,” and when executed, “cycl[es] the image displayed” in the embedded frame. Ex-1006 at 16:56-62.

POSITAs would have been motivated to combine Farber and Pavlovskaja because it was understood that JavaScript can make a web page more dynamic. Ex-1002, ¶141. For example, POSITAs would have been motivated to combine Farber’s “track label and artist information” graphic asset with Pavlovskaja’s JavaScript that created a “carousel” of rotating pages for display in order to show a rotating set of artist information graphics (like pictures of the artist/band). Ex-1002, ¶141. Such dynamic content would allow Farber to display more information to users for each song and improve the user experience. Ex-1002, ¶141.

POSITAs would have had a reasonable expectation of success in combining Farber with Pavlovskaja’s use of JavaScript because JavaScript was well-known in the art and could be readily embedded within HTML. Ex-1002, ¶142. And because Farber states that its interfaces “may be coded utilizing HTML,” use of JavaScript like in Pavlovskaja would not require altering Farber’s system. Ex-1003 at 5:50-54; Ex-1002, ¶142. Indeed, the ’441 Patent merely states that the UI “can include JavaScript, CSS, and HTML content files that can be rendered using a

browser,” which recognizes that use of JavaScript with HTML was common knowledge. Ex-1001 at 7:5-7; Ex-1002, ¶142.

As a result, Farber in view of Pavlovskaja renders claim 3 obvious.

D. Ground 4: Claims 4, 5 and 8 are obvious in view of Farber and Davis.

a. Claim 4

Element 4a

Element 4a	The method of claim 1, wherein encoding each of the media files include encoding each of the media files at a specified bit rate.
-------------------	---

Davis discloses storing “quality assured” media files that are encoded at specified rates. For example, for “Internet based video streaming,” Davis discloses using “a H.264 and AAC codec, with encoding profile 131b *configured for a 1.5 Mbit/s bit rate video and 128 Kbit/s audio.*” Ex-1008 at 3:21-41.

POSITAs would have been motivated to combine Farber and Davis because encoding at a specified bit rate would promote uniformity in the quality of media files, which would improve user experience. Ex-1002, ¶145. Additionally, encoding media at a specified rate that could be used with internet-based streaming would ensure that the sound and video quality of the stream is optimized for efficient media delivery. Ex-1002, ¶145. Similarly, encoding at a specified bit rate would allow the receiver to be optimized for decoding that bit rate. Ex-1002, ¶145. Moreover, Claim 4 does not specify any particular rate and, on its face, is satisfied

by a “specified rate” for the encoding process. Thus, POSITAs would have been motivated to use rates that Davis had already “quality assured” for internet based streaming applications.

POSITAs would have had a reasonable expectation of success in combining Farber with Davis’s disclosure of a specified bit rate because Farber already contemplates use of an MPEG video encoder and an audio encoder and assembling media into streams for delivery and the specified rates of Davis could readily have been used to encode the audio and video data of Farber. Ex-1002, ¶146. Encoding data and selecting encoding bit rates were commonly-known to POSITAs and would not have required altering Farber’s system. Ex-1002, ¶146.

As a result, Farber in view of Davis renders claim 4 obvious.

b. Claim 5

Element 5a

Element 5a	The method of claim 1, wherein encoding each of the media files include encoding each of the media files using a H.264 encoder.
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Davis teaches that “codec 130b could comprise a **H.264** and AAC codec.” Ex-1008 at 3:28-41.

POSITAs would have been motivated to combine Farber and Davis because the H.264 encoding standard is one of the most commonly used codecs for encoding video data. Ex-1002, ¶149. POSITAs recognize that H.264 encoding provides an impressive balance of quality and compression and can be readily used

with a number of container formats, such as MPEG-TS and MP4, to deliver streaming media. Ex-1002, ¶149.

POSITAs would have had a reasonable expectation of success in combining Farber with Davis’s disclosure of H.264 because Farber already contemplates use of an “MPEG” video encoder and H.264 is an MPEG video encoding standard—i.e., MPEG-4 Part 10. Ex-1003 at 6:2-7 and Ex-1002, ¶150.

As a result, Farber in view of Davis renders claim 5 obvious.

c. Claim 8

Element 8a

Element 8a	The method of claim 1, wherein encoding the media file is performed using an AC-3 file format for audio content in the media file.
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Davis discloses that a distribution channel “might require video files in Moving Picture Experts Group (MPEG) 2 format *with Dolby Digital Audio Coding 3 (AC-3) audio*.” Ex-1008 at 3:25-28.

POSITAs would have been motivated to combine Farber and Davis because the AC-3 encoding standard is one of the most commonly used codecs for encoding audio data. Ex-1002, ¶153. POSITAs recognize that AC-3 encoding provides an impressive balance of quality and compression and can deliver good sound quality at relatively low bit rates. Ex-1002, ¶153.

POSITAs would have had a reasonable expectation of success in combining Farber with Davis’s disclosure of AC-3 because Farber already contemplates use of an audio encoder and the system of Farber is not dependent on any encoding technology. Ex-1003 at 6:2-7 and Ex-1002, ¶154. Thus, implementing an AC-3 encoder would not have required altering Farber. Ex-1002, ¶154.

As a result, Farber in view of Davis renders claim 8 obvious.

E. Ground 5: Claims 6 and 9 are obvious in view of Farber and Fogel.

a. Claim 6

Element 6a

Element 6a	The method of claim 1, wherein the custom HTML user interfaces are configured to be rendered using a Webkit browser.
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Fogel discloses its “web interface module” is “a web rendering engine, also known as HTML rendering engine. For example, the skilled person *can use the engine Webkit.*” Ex-1009 at [0062]-[0064].

POSITAs would have been motivated to combine Farber and Fogel because the WebKit engine is commonly used, including in Apple’s Safari browser and all browsers for iOS and iPadOS. Ex-1002, ¶157. Thus, configuring the interfaces to be rendered on a WebKit browser would better ensure compatibility with Apple devices, such as iPhones and iPads, which make up a large percentage of mobile devices. Ex-1002, ¶157. The WebKit engine can also run on Windows, macOS,

Android and Linux Operating Systems, increasing flexibility in the implementation of Farber's system. Ex-1002, ¶157.

POSITAs would have had a reasonable expectation of success in combining Farber with Fogel because WebKit browsers—such as Safari—are commonly-used, including in Apple devices, to render HTML, and Farber already discloses that its interfaces can be coded using HTML. Ex-1002, ¶158; Ex-1003 at 5:50-54. Thus, use of a WebKit browser encoder would not have required altering Farber. Ex-1002, ¶158.

As a result, Farber in view of Fogel renders claim 6 obvious.

b. Claim 9

Element 9a

Element 9a	The method of claim 1, wherein the custom HTML user interfaces are configured so that multiple custom HTML user interfaces of the multimedia asset can be retrieved using a web rendering engine.
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Fogel discloses that “the interface module is a *web rendering engine*, also known as HTML rendering engine.” Ex-1009 at [0064].

POSITAs would have been motivated to combine Farber and Fogel because using a web rendering engine allows for an HTML file to be converted into a visual image, such as a user interface. Ex-1002, ¶161.

POSITAs would have had a reasonable expectation of success in combining Farber with Fogel because Farber already discloses that its interfaces can be coded

using HTML and already discloses generating multiple HTML user interfaces—e.g., screens 1, 2 and 3 with respect to each new song being broadcast. Ex-1002, ¶162; Ex-1003 at 5:50-54 and 4:35-36. Thus, use of a web rendering engine to retrieve and render those HTML interfaces is already contemplated and would not have required altering Farber. Ex-1002, ¶162.

As a result, Farber in view of Fogel renders claim 9 obvious.

F. Ground 6: Claims 10-16 and 18-23 are obvious in view of Avellan and Pavlovskaja-PCT.

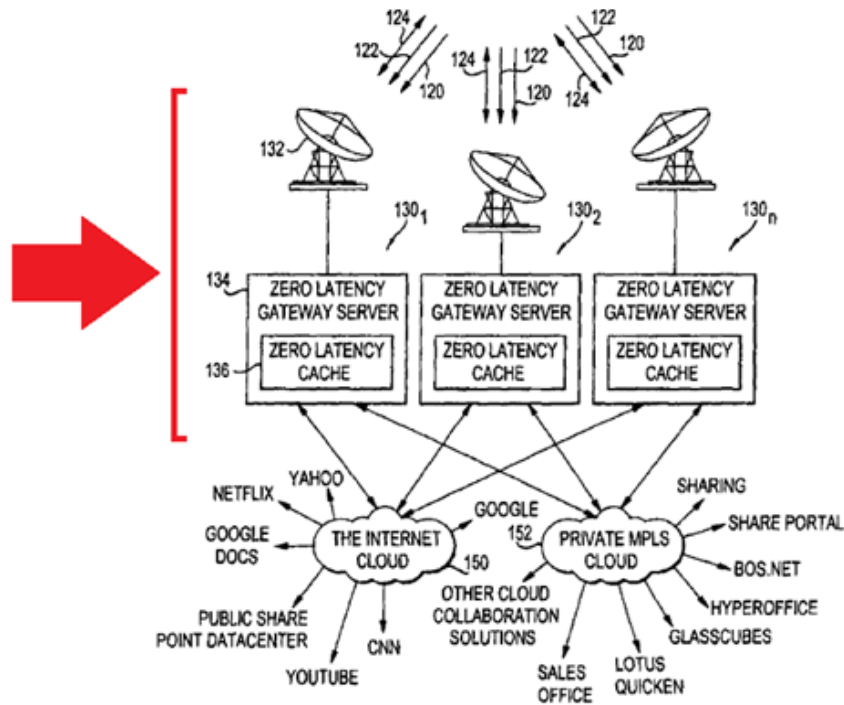
a. Claim 10

Preamble 10

Preamble 10	A computer-implemented method comprising:
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Avellan teaches Preamble 10.

Specifically, Claim 10 is performed by Avellan’s “gateway platforms 130” (red arrow), each of which “includes a respective satellite antenna 132 or a broadcast transmitter/receiver, and a gateway server 134 [and] a cache 136.” Ex-1004 at 3:64-66.



Ex-1004 at Fig. 1. Thus, Avellan discloses a computer implemented method as described below.

Element 10a

Element 10a	virtualizing a system including a virtualized caching server, wherein the virtualized caching server performs:
--------------------	--

Avellan states the gateway can be on “a server farm” or “mainframe.” Ex-1004 at 4:26-29.

Pavlovskiaia-PCT teaches using a virtual machine to virtualize the process of generating “a plurality of broadcast programs.” Ex-1007 at 3:3-5. Pavlovskiaia-PCT’s “processing office” obtains web content from a distribution network and “renders the graphical element as a bitmap and the renderer passes the bitmap to an MPEG element encoder” to create an MPEG video stream. Ex-1007 at 11:12-22

and 15:5-6. Pavlovskaia-PCT states that this processing “occurs at the processing office *and is orchestrated by the assigned virtual machine.*” Ex-1007 at 13:26-14:2 and 8:1-2 (stating “the processing office runs a virtual machine and accesses and runs the requested application”).

POSITAs would have been motivated to use such a virtual machine because they are an efficient and effective way to implement a system like Avellan. Ex-1002, ¶167. Virtual Machines are known to be a flexible and scalable solution for content delivery and can reduce hardware costs. Ex-1002, ¶167.

POSITAs would have had a reasonable expectation of success in combining Avellan’s system with Pavlovskaia-PCT’s disclosure of virtual machines because of the overlap in both systems. Ex-1002, ¶167. Both Avellan and Pavlovskaia-PCT are directed to server-side software that obtains web-based content, renders it using a browser, and then packages it for delivery in a video frame format. Ex-1002, ¶167. POSITAs would have also recognized that Avellan’s “network of servers, mainframe computer(s) or other high speed and high capacity processing devices,” Ex-1003 at 4:26-29, that “may be positioned at a strategic Internet Exchange Point (IXP),” Ex-1003 at 4:29-31, were compatible with use of a virtual machine and would not require altering Avellan’s operation. Ex-1002, ¶166.

Element 10b

Element 10b	receiving, from a content provider, a request for at least one media stream for playback on a broadcast media channel, wherein the at
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	least one media stream includes a plurality of multimedia items of different types;
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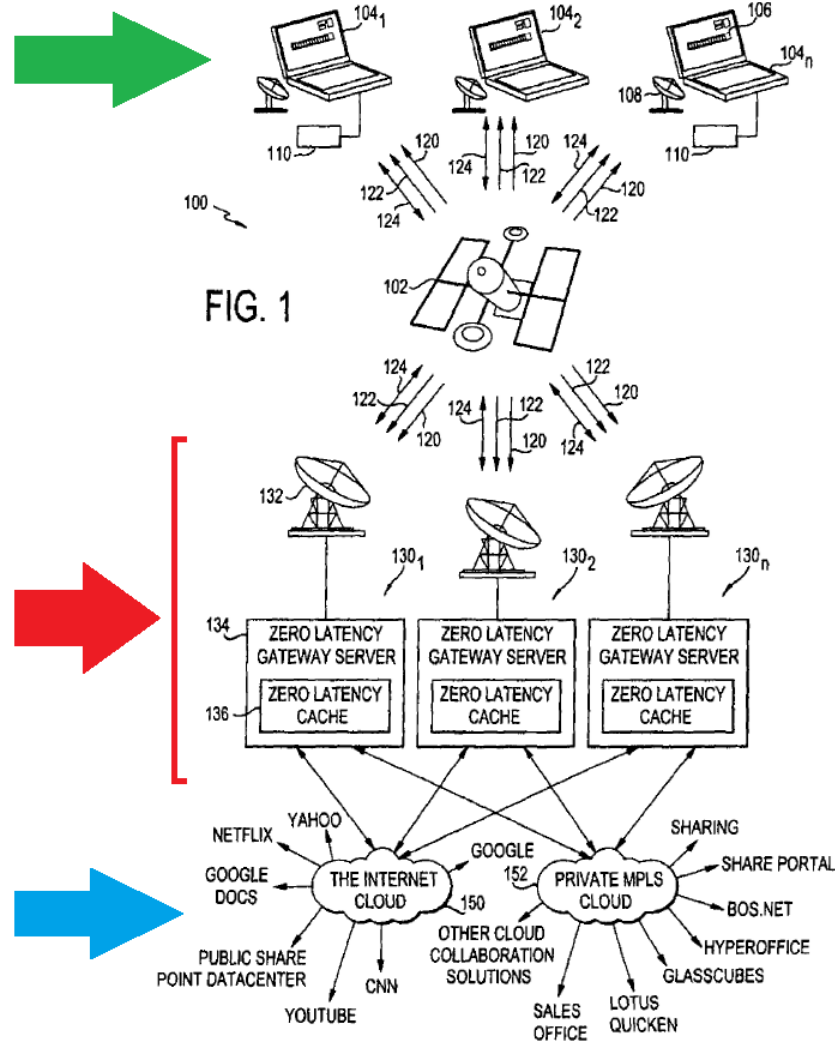
Avellan teaches Element 10b.

First, Avellan’s “system 100 provides for the user computers 104₁-104_n to access the Internet 150 and/or private network cloud 152 through a virtual browser 106 of the gateway 130.” Ex-1004 at 4:18-21. “The user operates the browser 106 which *sends a signal over the satellite 102 to the gateway 130*,” which in turn “accesses the networks 150, 152 and returns the results to the virtual browser 106 via the satellite 102.” Ex-1004 at 4:21-25 and 6:22-25 (stating that “the gateway server 134 retrieves the information desired by the user”). Avellan states “the browser software 106 resides at the gateway 134, and is configured to run as a virtual browser as a remote client of the gateway server 134.” Ex-1004 at 4:56-58.

Avellan further teaches that “gateway platform 130 can broadcast information over the antennas 132 and the broadcast device 102 to a large number of user computers 104 via the wired or wireless connection 108.” Ex-1004 at 4:36-49. For example, “[i]f a large number of viewers choose to select a certain hockey game, that page of the website can also be sent in the broadcast mode.” Ex-1004 at 8:34-36.

As a result, referring to Figure 1, Avellan discloses that user computer 104 (green arrow) can request media streams from either the Internet or a private network cloud (collectively, blue arrow) for playback. That request is received

from the satellite content provider by gateway platform 130 (red arrow), which then obtains the content and processes it using the disclosed browser software, and then provides the requested media stream to the content provider for broadcast.



Ex-1004 at Fig. 1.

Second, the media stream includes a plurality of multimedia items of different types. With respect to this element, the '074 Patent states that “[t]he

media stream can include any number of multimedia items such as audio/video multimedia items” and that “the request can include a channel identifier that is associated with a particular category of multimedia items, such as a music genre corresponding to rock, classical, jazz, etc.” Ex-1001 at 7:49-54.

In the same manner, Avellan states “there can be a number of broadcast channels and each channel can have a specific theme, such as country music, military television, etc.” Ex-1004 at 8:25-27. “The user can then tune the browser 106 to one of the broadcast channels to receive that content.” Ex-1004 at 8:27-31. Avellan teaches that “suitable sites for the broadcast mode are news sites like CNN, BBC, newspaper, live streaming television feeds, movies, music downloads, or ESPN.” Ex-1004 at 8:18-21.

Accordingly, Element 10b is disclosed by Avellan.

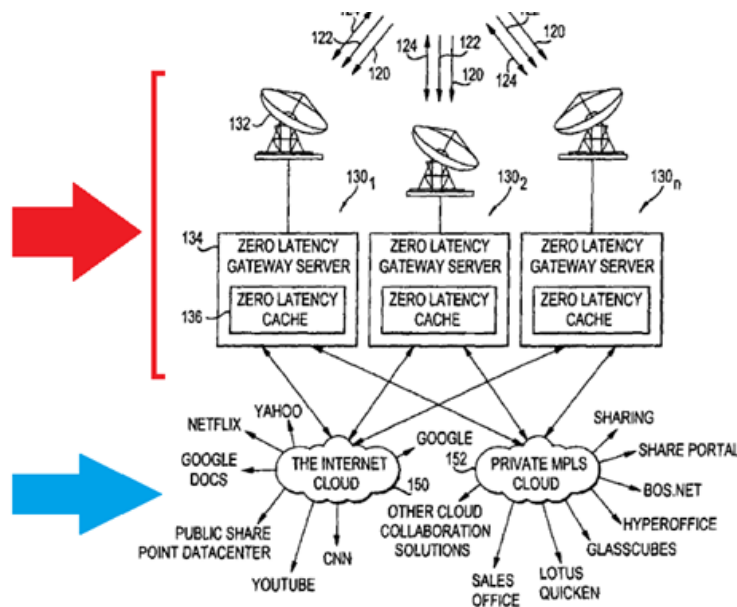
Element 10c

Element 10c	obtaining content corresponding to the plurality of multimedia items from at least one source offering the content in at least one first format;
--------------------	--

Avellan teaches Element 10c.

As disclosed by Avellan, “the gateway server 134 may be configured to communicate with the public computers, servers, networks or clouds such as the Internet cloud 150, and/or one or more private computers, servers, networks or clouds 152 such as a private MPLS (MultiProtocol Label Switching) cloud.” Ex-

1004 at 4:14-18. “In the broadcast mode, the gateway server 134 retrieves the desired data from the networks 150, 152, captures that data (including audio) to a video (or image) frame format, compresses that video data and stores the compressed video data to the gateway 130 at the cache 136.” Ex-1004 at 8:42-46. Similarly, and for example, Avellan states that “[t]he gateway server 134 can track the CNN site on the Internet cloud 150 and store the site to the gateway cache 136 whenever the site is modified and/or at predetermined periodic intervals.” Ex-1004 at 10:46-49. As shown in Figure 1, the networks 150 and 152 provide a range of content, including content from multimedia websites like CNN, Netflix and YouTube (see blue arrow).



Ex-1004 at Fig. 1. As a result, Avellan teaches that content corresponding to the plurality of multimedia items is obtained from at least one source, including

networks 150 and 152 and/or cache 136, and that content will be in a first format. Accordingly, Element 10c is disclosed by Avellan.

Element 10d

Element 10d	rendering a web page by a browser using the content;
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Avellan teaches Element 10d.

Avellan states that “the browser software 106 resides at the gateway 134” and “may rely upon the computing power and very high-speed connection of the gateway server 134 to resolve and *render pages, images, and documents* from the networks 150, 152.” Ex-1004 at 4:56-65.

Element 10e

Element 10e	generating a temporal sequence of screen captures of the rendered web page, where each screen capture defines all the content of the web page at a given time, and at least two adjacent screen captures illustrate a dynamic change of at least a portion of the content over time;
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Avellan teaches Element 10e.

First, Avellan teaches generating screen captures of the rendered web page, where each screen capture defines all the content of the web page at a given time. As discussed above, gateway 134 includes browser software 106 that renders web pages using the content obtained from the Internet and/or a private network (*i.e.*, networks 150 and 152). “The gateway server 134 then images those web pages (which are typically in an HTTP format) to a video or image frame format.” Ex-

1004 at 4:65-67. Avellan teaches that this screen capture process “is preferably done by taking an image of the entire web page from top to bottom, including any portion that would normally be accessed by scrolling up/down or left/right but not immediately displayed on the screen because it is too long for a single screen.” Ex-1004 at 4:67-5:4.

Second, Avellan teaches generating a temporal sequence of such screen captures and that at least two adjacent screen captures illustrate a dynamic change of at least a portion of the content over time. Avellan teaches that “web pages often have information which is rendered over a period of time, such as a video, streaming information, or an animated display. Accordingly, the gateway server 134 *continuously captures images of the web page* until it detects a repeating pattern of the information in the web page.” Ex-1004 at 5:5-5:10. “Thus, gateway server 134 will be certain to capture all the information on the web page *even if that information continues over a period of time.*” Ex-1004 at 5:10-5:12.

By continuously capturing screen images of information that is rendered over time—such as “video, streaming information, or an animated display”—two adjacent screen captures will illustrate a dynamic change of at least a portion of the content over time. Ex-1002, ¶168. For example, if a streaming hockey game is being rendered, a screen capture at Time 1 followed by a screen capture at Time 2 will illustrate a dynamic change in that game, such as the movement of players on

the ice between Time 1 and Time 2—*i.e.*, a dynamic change of at least a portion of the content over time. Ex-1002, ¶168. Accordingly, Element 10e is disclosed by Avellan.

Element 10f

Element 10f	assembling the at least one media stream using the temporal sequence of screen captures; and
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Avellan teaches Element 10f.

After continuously capturing screen images, Avellan teaches that it can then “compress the data into a compressed digital video format that can be sent to the user computer 104 for display in the browser 106.” Ex-1004 at 5:20-5:22. As stated in Avellan, “[o]nce the page is imaged (including any audio on the web page), the gateway server 134 compresses the image or video frame format and sends it to the browser 106 via the satellite 102.” Ex-1004 at 5:12-5:15.

Element 10g

Element 10g	providing the at least one media stream to the content provider for broadcast on the broadcast media channel.
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Avellan teaches Element 10g.

As discussed above, “[o]nce the page is imaged (including any audio on the web page), the gateway server 134 compresses the image or video frame format and sends it to the browser 106 via the satellite 102.” Ex-1004 at 5:12-5:15. Avellan specifically notes that “suitable sites for the broadcast mode are news sites

like CNN, BBC, newspaper, *live streaming television feeds, movies*, music downloads, or ESPN.” Ex-1004 at 8:18-21.

As a result, Avellan in view of Pavlovskiaia-PCT renders claim 10 obvious.

b. Claim 11

Element 11a

Element 11a	The method of claim 10, wherein the obtaining comprises: retrieving, for each of the plurality of multimedia items, at least one audio file corresponding to an audio component of the multimedia item and a plurality of screen captures corresponding to a video component of the multimedia item.
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Avellan teaches Element 11a.

Avellan discloses “gateway server 134 retrieves the desired data from the networks 150, 152, captures that data (*including audio*) to a video (or image) frame format, compresses that video data and stores the compressed video data in the gateway 130 at the cache 136.” Ex-1004 at 8:42-46 and 5:12-5:15 (stating “[o]nce the page is imaged (*including any audio on the web page*), the gateway server 134 compresses the image or video frame format and sends it to the browser 106 via the satellite 102.” Ex-1004 at 5:12-5:15.

“Once the broadcast data is stored in the gateway cache 136, the gateway server 134 then transmits that data to the multiple user computers 104.” Ex-1004 at 8:54-56 and 8:18-21 (explaining that system 100 can be used to broadcast “live streaming television feeds” and “movies”). As a result, the gateway server 134

obtains both audio file data corresponding to an audio component and a plurality of screen captures corresponding to a video component of the multimedia item for broadcast. Accordingly, Element 11a is disclosed by Avellan.

c. Claim 12

Element 12a

Element 12a	The method of claim 11, wherein the generating comprises: combining the plurality of screen captures and the at least one audio file to create each of the plurality of multimedia items.
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Avellan teaches Element 12a.

As discussed above, “gateway server 134 retrieves the desired data from the networks 150, 152, captures that data (including audio) to a video (or image) frame format.” Ex-1004 at 8:42-46. And Avellan explicitly states that “suitable sites for the broadcast mode are news sites like CNN, BBC, newspaper, *live streaming television feeds, movies*, music downloads, or ESPN,” which POSITAs recognize include audio and visual data. Ex-1004 at 8:18-21; Ex-1002, ¶170. As a result, Avellan teaches combining screen captures and audio files to create the multimedia items.

d. Claim 13

Elements 13a-13c

Element 13a	The method of claim 12, further comprising: the virtualized caching server detecting a change at the at least one webpage corresponding to at least one of the plurality of multimedia items;
Element 13b	in response to detecting the change, retrieving a new plurality of

	screen captures from the at least one webpage for the at least one of the plurality of multimedia items; and
Element 13c	reassembling the at least one of the plurality of multimedia items using the new plurality of screen captures to yield an updated multimedia item.

Avellan teaches Element 13a-13c.

Avellan discloses that “[a]s the broadcast sites are updated, the updated sites are cached 136 and sent to the user computers 104.” Ex-1004 at 8:63-64. “For instance, the gateway server 134 can *continuously or periodically compare* the broadcast data stored in the cache 136 with the broadcast data at the networks 150, 152 and *re-capture any broadcast data which is updated.*” Ex-1004 at 8:65-9:3.

Additionally, as previously discussed for Claim Element 10e, Avellan continuously screen captures web pages that have “video, streaming information, or an animated display.” Ex-1004 at 5:5-5:10. And “[a]s the information is updated, the updated broadcast data is compressed, saved to cache 136, broadcast to the user computers 104, and stored in the storage device 110.” Ex-1004 at 9:3-6. Accordingly, when a site with video is updated, Avellan will re-capture a new plurality of images and assemble a new multimedia item.

e. Claim 14

Element 14a

Element 14a	The method of claim 11, wherein the retrieving of the plurality of screen captures comprises obtaining the plurality of screen captures from a playback of a video on the at least one webpage.
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Avellan teaches Element 14a.

Avellan teaches that “web pages often have information which is rendered over a period of time, *such as a video*, streaming information, or an animated display. Accordingly, the gateway server 134 *continuously captures images of the web page* until it detects a repeating pattern of the information in the web page.” Ex-1004 at 5:5-5:10. And Avellan explicitly states that “suitable sites for the broadcast mode are news sites like CNN, BBC, newspaper, *live streaming television feeds, movies*, music downloads, or ESPN,” which a POSITA recognizes would include the playback of video. Ex-1004 at 8:18-21; Ex-1002, ¶172.

f. Claim 15

Element 15a

Element 15a	The method of claim 14, wherein the combining of the plurality of screen captures comprises metadata corresponding to at least one of a song title, an artist, and a music genre.
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Avellan teaches Element 15a.

Avellan teaches that “there can be a number of broadcast channels and each channel *can have a specific theme, such as country music*, military television, etc.” Ex-1004 at 8:25-27. POSITAs would understand that a music channel “such as country music” would include metadata corresponding at least to the song title, artist, or the genre. Ex-1002, ¶173.

g. Claim 16**Element 16a**

Element 16a	The method of claim 10, further comprising: the virtualized server identifying the at least one webpage based on a channel identifier associated with the broadcast media channel.
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Avellan teaches Element 16a.

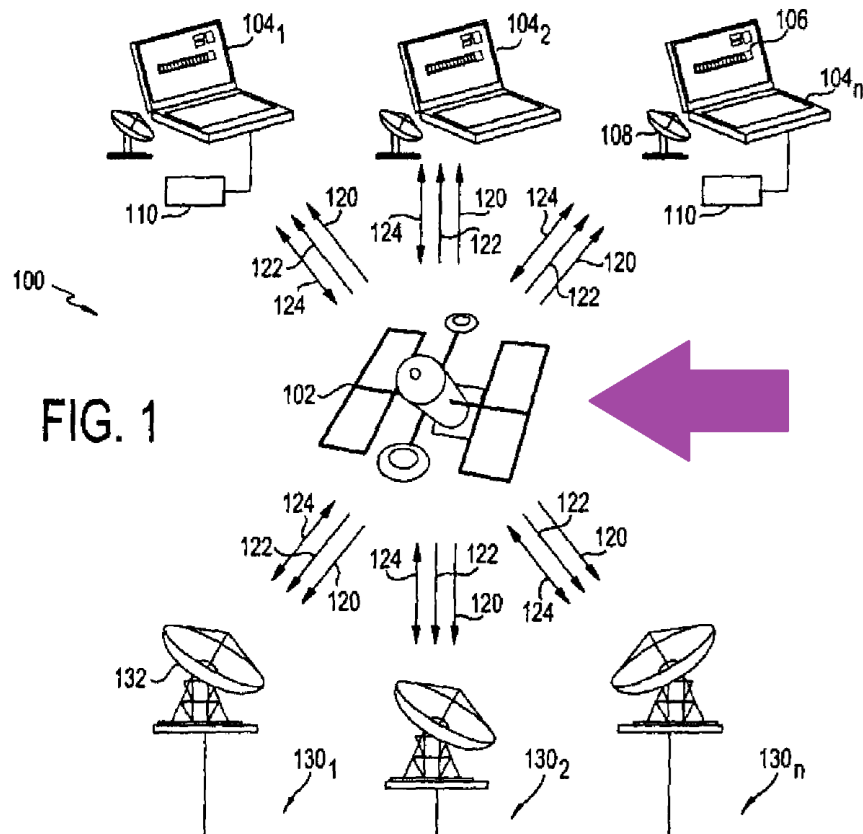
Avellan teaches that “there can be a number of broadcast channels” and that “[t]he user can then tune the browser 106 to one of the broadcast channels to receive that content.” Ex-1004 at 8:25-29 and 8:18-21. POSITAs would understand that each broadcast media channel in Avellan must have an associated channel identifier that permits the user to tune to a particular channel. Ex-1002, ¶174. Accordingly, Avellan inherently discloses Element 16a.

h. Claim 18**Element 18a**

Element 9a	The method of claim 10, wherein the content provider is a cable television operator or a satellite television operator.
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Avellan teaches Element 18a.

Avellan teaches that “the broadcast device 102 can be a satellite 102 [purple arrow].” Ex-1004 at 4:36-39.



Ex-1004 at Fig. 1 and 8:18-21 (stating “suitable sites for the broadcast mode” include “live streaming television feeds”). Thus, Avellan teaches that the content provider can be a satellite television operator.

i. Claim 19

Element 19a

Element 19a	The method of claim 10, wherein providing the at least one media stream to the content provider comprises streaming the at least one media stream to an MPEG multiplexer associated with the content provider.
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Pavlovskaja-PCT discloses that “multiplexor 1280 combines the audio and video streams and outputs the composited, encoded output streams 1290 that can

be played on any standard encoder.” Ex-1007 at 24:5-6. Pavlovskaia-PCT discloses that the multiplexor multiplexes “an MPEG stream.” Ex-1007 at 30:13 and 13:20-21 (stating that a “frame will then be passed to a multiplexor and sent through the downstream network to the client device” and that “[t]he MPEG encoded video frame is decoded by the client device”).

POSITAs would have been motivated to combine Avellan with Pavlovskaia-PCT because use of an MPEG multiplexor is an easy and reliable way of sending a transport stream combining related audio and video data—which would need to be received at relatively the same time in order to be played back in sync—as compared to sending such streams separately downstream. Ex-1002, ¶177.

POSITAs would have had a reasonable expectation of success in combining Avellan’s broadcast system with Pavlovskaia-PCT’s use of an MPEG multiplexor because such a combination would not have required any alteration to the system of Avellan, which as discussed above, already discloses the use of a video frame format, like MPEG, that includes encoded audio. Ex-1004 at 5:13-15; Ex-1002, ¶178. Indeed, the ’074 Patent does not purport to have invented the MPEG multiplexor and specifically notes that such multiplexors—like the “Arris TMX-2010”—were publicly-available prior to the ’441 Patent. Ex-1001 at 4:30-32.

As a result, Avellan in view of Pavlovskaia-PCT renders claim 19 obvious.

j. Claim 20**Element 20a**

Element 20a	The method of claim 10, further comprising: the virtualized caching server provisioning, on at least one server, at least one virtual machine for performing the receiving, obtaining, generating, assembling, and providing.
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Pavlovskaia-PCT teaches generating “a plurality of broadcast programs” for delivery to users. Ex-1007 at 3:3-5. Specifically, Pavlovskaia-PCT discloses a “processing office” that obtains web content and then “renders the graphical element as a bitmap” and encodes the bitmap “as an MPEG video sequence” for delivery. Ex-1007 at 11:12-22 and 15:5-6 (“Once the content and the application are retrieved, the virtual machine processes the content and creates an MPEG video stream.”). Pavlovskaia-PCT states that all of this process “occurs at the processing office *and is orchestrated by the assigned virtual machine.*” Ex-1007 at 13:26-14:2 and 8:1-2 (stating “the processing office runs a virtual machine and accesses and runs the requested application”). As a result, Pavlovskaia-PCT teaches the use of a virtual machine for receiving, obtaining, generating, assembling, and providing broadcast media content.

POSITAs would have been motivated to combine Avellan with Pavlovskaia-PCT’s use of such a virtual machine because virtual machines are an efficient and effective way to implement a system like Avellan. Ex-1002, ¶180. Virtual Machines are a flexible and scalable solution for content delivery that reduces

hardware costs. Ex-1002, ¶180. They are also advantageous for overall system reliability and performance because the virtual machine can be moved to different hardware servers to allow for system maintenance or hardware upgrades. Ex-1002, ¶180.

POSITAs would have also been motivated to combine Avellan with Pavlovskaia-PCT because of the overlap in both systems: both Avellan and Pavlovskaia-PCT are directed to server-side software that obtains web-based content, renders it using a browser, and then packages it for delivery in a video frame format. Ex-1002, ¶181. Because of this similarity, POSITAs would have had a reasonable expectation of success in combining Avellan's system with Pavlovskaia-PCT's disclosure of virtual machines. Ex-1002, ¶181. Avellan's "network of servers, mainframe computer(s) or other high speed and high capacity processing devices," Ex-1003 at 4:26-29, that "may be positioned at a strategic Internet Exchange Point (IXP)," Ex-1003 at 4:29-31, is compatible with Pavlovskaia-PCT's use of virtual machines and would not require altering Avellan's operation. Ex-1002, ¶181.

As a result, Avellan in view of Pavlovskaia-PCT renders claim 20 obvious.

k. Claim 21

Element 21a

Element 21a	The method of claim 10, wherein virtualizing the system is performed using one of Docker, Xenserver, or a virtual machine.
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For the same reasons as in Element 20a, it would have been obvious to combine Pavlovskaia-PCT's use of virtual machines with Avellan. Ex-1002, ¶182.

As a result, Avellan in view of Pavlovskaia-PCT renders claim 21 obvious.

l. Claim 22

Element 22a

Element 22a	The method of claim 10, wherein virtualizing the system includes virtualizing the system to include at least one virtualized multicasting server that perform the providing at least one media stream to the content provider.
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Avellan discloses that it can deliver a stream by “multi-casting it to subscribers.” Ex-11004 at 12:15-20. For the same reasons as in Element 20a, it would have been obvious to combine Pavlovskaia-PCT's use of virtual machines with Avellan to virtualize a multicasting server for providing a media stream to a content provider. Ex-1002, ¶183.

As a result, Avellan in view of Pavlovskaia-PCT renders claim 22 obvious.

m. Claim 23

Element 23a

Element 23a	The method of claim 10, wherein virtualizing the system is performed for one channel, wherein the virtualized caching server is operable for one channel, wherein virtualizing the system is repeated for each one of a plurality of other channels.
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In Pavlovskaia-PCT, generating a data channel “occurs at the processing office *and is orchestrated by the assigned virtual machine.*” Ex-1007 at 13:26-

14:2. For example, “[w]hen a client device sends a request for a mosaic application, the processing office associated with the client device *assigns a processor/virtual machine for the client device for the requested mosaic application.*” Ex-1007 at 30:9-11. “The assigned virtual machine constructs the personalized mosaic by composting the groomed content from the desired channels using a stitcher.” Ex-1007 at 30:11-12. “The virtual machine [then] sends the client device an MPEG stream that has a mosaic of the channels that the client has requested.” Ex-1007 at 3:12-14.

Accordingly, POSITAs would understand that a user in Pavlovskaja-PCT receives a desired channel (i.e., a requested mosaic delivering a video stream) that corresponds to an assigned virtual machine. Ex-1007 at Fig. 22 and 29:24-26 (stating that “channels may then be multicast to one or more processing offices 2310, 2320, 2330 and one or more virtual machines within each of the processing offices for use in applications”). Ex-1002, ¶184.

For the same reasons as in Element 20a, it would have been obvious to combine Pavlovskaja-PCT’s use of assigned virtual machines for each channel with the system of Avellan. Ex-1002, ¶185.

As a result, Avellan in view of Pavlovskaja-PCT renders claim 23 obvious.

G. Ground 7: Claim 15 is obvious in view of Avellan, Pavlovskaia-PCT and Durante.

a. Claim 15

Element 15a

Element 15a	The method of claim 14, wherein the combining of the plurality of screen captures comprises metadata corresponding to at least one of a song title, an artist, and a music genre.
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Durante discloses that “metadata associated with a music video can include a title of the song in the music video [and] the name of an artist that recorded the song in the music video.” Ex-1010 at 4:46-48.

POSITAs would have been motivated to combine Durante’s descriptive metadata with Avellan’s music genre broadcast channels so that viewers/devices could identify the specific song and name of the artist. Ex-1002, ¶188. POSITAs would have had a reasonable expectation of success in making this combination because Avellan’s system delivers its channels in a “video frame format”—such as the commonly used MPEG format—and the MPEG standard includes provisions for the inclusion of metadata, such as the song and artist information disclosed in Durante. Ex-1002, ¶188.

As a result, Avellan and Pavlovskaia-PCT in view of Durante renders claim 15 obvious.

H. Ground 8: Claim 16 is obvious in view of Avellan, Pavlovskaia-PCT and Ma.

a. Claim 16

Element 16a

Element 16a	The method of claim 10, further comprising the virtualized caching server identifying the at least one webpage based on a channel identifier associated with the broadcast media channel.
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Pavlovskaia-PCT teaches using a virtual machine to virtualize the process as discussed in Ground 6, [10a]. Ma teaches that “a user can assign different channel identifiers to various web sites, for example, a first web site (such as “THOMSON.NET”) can be assigned channel identifier 101, a second web site (such as “YAHOO.COM”) can be assigned to channel identifier 102, and a third web site (such as “GAMEFAQS.COM”) can be assigned to a third channel identifier 103.” Ex-1011 at 5:5-11. As a result, “channels 1-100 would provide media services associated with broadcasted television channels, while channel 102 brings up a representation of the content on the homepage YAHOO.COM.” Ex-1011 at 5:13-16.

It would have been obvious for POSITAs to combine the channel identifier of Ma with Avellan’s system, which discloses that “[t]he user can then tune the browser 106 to one of the broadcast channels to receive that content.” Ex-1004 at 8:27-29; Ex-1002, ¶191. POSITAs would have been motivated to combine Avellan’s disclosure of tuning to broadcast channel with Ma’s teachings of channel

identifiers so that a user could select between channels based upon identifiers. Ex-1002, ¶191.

POSITAs would have had a reasonable expectation of success in combining Avellan with Ma because Avellan’s system describes being able to obtain content from websites, such as CNN, ESPN, YouTube or from web services like Netflix. Ex-1004 at Fig. 1. Similarly, Ma teaches assigning “different channel identifiers to various web sites,” such as Yahoo.com. Ex-1011 at 5:5-11; Ex-1002, ¶192. POSITAs would have recognized that assigning Ma’s alphanumeric channel identifier to Avellan’s channels—for example, a request for the “ESPN” channel would be implemented in the same manner as a request for channel “008”, where “008” is assigned to ESPN—was a trivial task and would not have required altering Avellan. Ex-1002, ¶192.

As a result, Avellan and Pavlovskaja-PCT in view of Ma renders claim 16 obvious.

I. Ground 9: Claim 17 is obvious in view of Avellan, Pavlovskaja-PCT and Suzuki.

a. Claim 17

Element 17a

Element 17a	The method of claim 10, further comprising: the virtualized server querying the content provider to determine the second format, wherein the second format corresponds to a Moving Picture Experts Group (MPEG) format.
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Suzuki discloses “an automatic format conversion process then *queries information from the client system* (requester) and also received the data structure identifying the encoding format. The *client information identifies the decoding format* compatible with the client.” Ex-1012 at 3:44-49. Suzuki further discloses that the data “can be formatted under any number of the well-known formatting standards *such as, for example, MPEG.*” Ex-1012 at 6:37-40.

POSITAs would have been motivated to combine Avellan with Suzuki because it is advantageous to query the downstream content provider to determine what output “video frame format” was able to be decompressed and displayed at the user devices—*i.e.*, to determine what format was “suitable” for a given device. Ex-1002, ¶195. And POSITAs would have had a reasonable expectation of success, given that Avellan converts web content into a compressed “video frame format” that is “suitable for broadcasting to a large number of user computers” and “any suitable format(s)” can be used. Ex-1004 at 5:12-32, 8:52-53. In the same manner, the ’441 Patent describes “a second format” as “a format that is suitable for the cable operator.” Ex-1001 at 8:8-13. Avellan also states that the user computers 104 “can be any suitable device . . . such as a laptop computer, desktop computer, smartphone, tablet PC, laptop, and Internet equipped television.” Ex-1004 at 3:53-56. As a result, it would have been obvious to include Suzuki’s query-answer exchange to determine decoding capabilities prior to generating the

video frames for delivery, and such use would not have required any alteration of the system of Avellan. Ex-1002, ¶195.

Moreover, POSITAs would have understood that Avellan’s process of generating a sequence of screen captures for compression into a “video frame format” is compatible with the MPEG format, which compresses video data into a sequence of video frames for decoding. Ex-1002, ¶196. As a result, use of MPEG as the “second format” would have been obvious and not required any alteration of the system of Avellan. Ex-1002, ¶196. Similarly, prior to the ’441 Patent, the MPEG format was commonly used to encode video, and the MPEG codec was commonly found in a range of user devices, including laptops, desktops, smartphones, tablets, and Internet-equipped televisions. Ex-1002, ¶196.

As a result, Avellan and Pavlovskaia-PCT in view of Suzuki renders claim 17 obvious.

J. Ground 10: Claim 24 is obvious in view of Avellan, Pavlovskaia-PCT and Gangadharan.

a. Claim 24

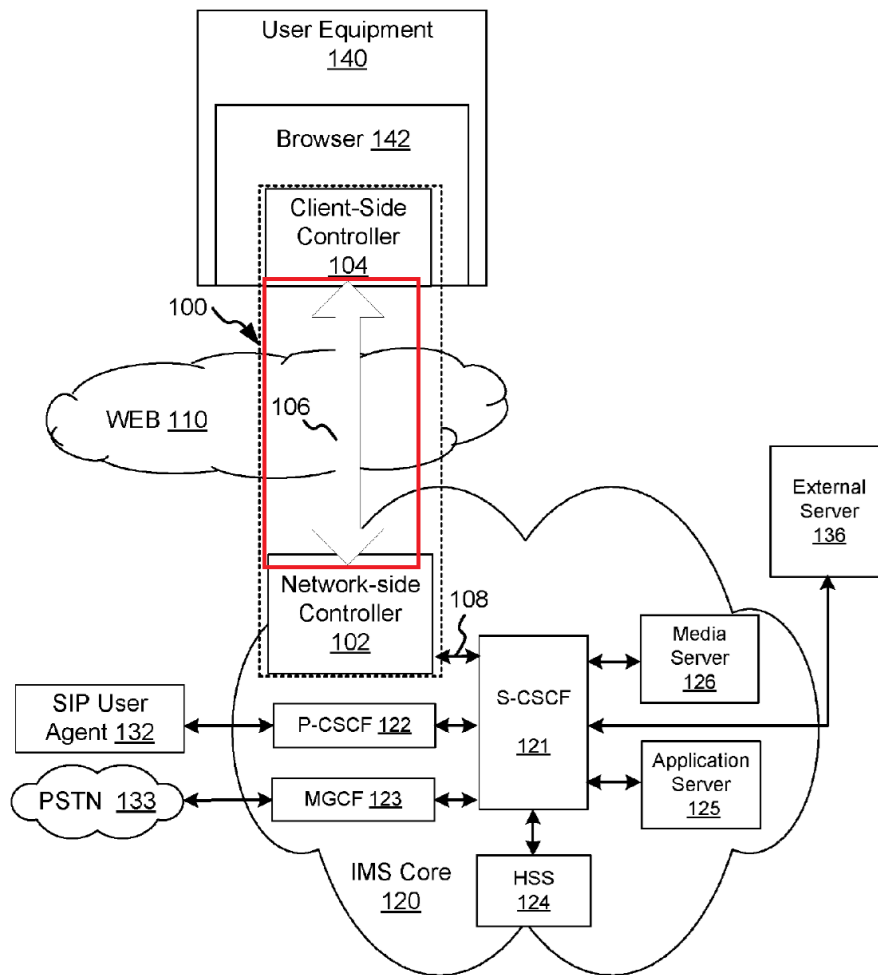
Element 24a

Element 24a	The method of claim 10, wherein receiving the request is performed using a JSON API.
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Gangadharan teaches a protocol 106 (red box) for “transmitting signaling messages to and from HTML5 applications.” Ex-1014 at 5:8-10. “The protocol

utilizes JavaScript Object Notation (JSON) and, thus, leverages JSON objects commonly used by HTML5 applications, to specify a message format, data exchange protocol, and reliability protocol.” Ex-1014 at 5:10-14.

Figure 1A



Ex-1014 at Fig. 1A.

POSITAs would have been motivated to combine Avellan and Gangadharan because, as stated in Gangadharan, JSON “is a text-based open standard designed for human-readable data interchange” and “can be used for serializing and

transmitting structured data over a network connection, e.g., between a server and web application” and “can be used by a network-side controller to mediate between HTML5 applications and non-HTML5 endpoints” and “can also be used between HTML5 endpoints.” Ex-1002, ¶199; Ex-1014 at 5:16-37. POSITAs recognize that JSON is a flexible standard that easily allows for exchanging data to/from a web server. Ex-1002, ¶199.

POSITAs would have had a reasonable expectation of success using Gangadharan’s JSON-based protocol to send requests to Avellan’s caching server because Avellan discloses sending requests from client browser 106, and a common use of JSON is to read data from a web server and display the data in a rendered web page on a browser. Ex-1002, ¶200. JSON is also language independent and can be used with a wide variety of client-server architectures. Ex-1002, ¶200. For example, Gangadharan explicitly teaches that “JSON objects [are] commonly used by HTML5 applications.” Ex-1014 at 5:10-14.

As a result, Avellan and Pavlovskiaia-PCT in view of Gangadharan renders claim 24 obvious.

K. Ground 11: Claim 25 is obvious in view of Avellan and Wannamaker.

a. Claim 25

Preamble 25 and Elements 25a-25f

Preamble 25	A computer-implemented method comprising:
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Element 25a	receiving, from a content provider, a request for at least one media stream for playback on a broadcast media channel, wherein the at least one media stream includes a plurality of multimedia items of different types;
Element 25b	obtaining content corresponding to the plurality of multimedia items from at least one source offering the content in at least one first format, performed over a first TCP-IP socket of a caching unit;
Element 25c	rendering a web page by a browser using the content;
Element 25d	generating a temporal sequence of screen captures of the rendered web page, where each screen capture defines all the content of the web page at a given time, and at least two adjacent screen captures illustrate a dynamic change of at least a portion of the content over time;
Element 25e	assembling the at least one media stream using the temporal sequence of screen captures;
Element 25f	providing the at least one media stream to the content provider for broadcast on the broadcast media channel; and

For the same reasons discussed in Ground 6 for Preamble 10 and Elements 10b-10g, Avellan discloses the corresponding language of Preamble 25 and Elements 25a-25f.

With respect to Element 25b and the phrase “performed over a first TCP-IP socket,” Avellan discloses that “the gateway server 134 retrieves the desired data from the networks 150, 152,” which correspond to the “Internet Cloud” and a “Private MPLS Cloud,” respectively. Ex-1004 at 8:42-43 and Fig. 1. Avellan further teaches that “the Internet cloud is a global system of interconnected computer networks that use the standard Internet Protocol Suite (TCP/IP) to serve billions of users worldwide.” Ex-1004 at 1:14-16. As a result, Avellan discloses obtaining content from at least the Internet using a first TCP/IP socket.

Element 25g**Element 25g**

providing, at a second TCP/IP socket of the caching unit, a status of the obtaining, generating, and assembling.

Wannamaker can deliver “broadcast services” using an “application server [that] transcodes Web pages into a format that is viewable on the set-top box.” Ex-1013 at [0120] and [0132]. The application server hosts processes, including a “log server” and a “host monitoring server.” Ex-1013 at [0139]-[0147]. Wannamaker teaches that “[p]rocesses register *their socket host and port* with the supervisor.” Ex-1013 at [0149]. In connection with those processes, Wannamaker discloses an “operator management interface (OMI)” that can “monitor and control the application server” from a remote location and has “the capability to view log messages, start up and shut down the system, monitor and terminate user sessions, and monitor downstream bandwidth.” Ex-1013 at [0305]-[307]. POSITAs would recognize that the status information would be sent to the OMI from the application server through “a second TCP/IP socket”—*i.e.*, the socket host and port registered with the supervisor process. Ex-1002, ¶203.

POSITAs would have been motivated to combine Avellan and Wannamaker because use of a second TCP/IP port for monitoring would allow a remote monitoring station to receive data independently, which better organizes data traffic and avoids confusion about which process should be receiving/sending data. Ex-1002, ¶204. Similarly, monitoring the system of Avellan, as in Wannamaker,

would have the advantage of allowing an operator to better respond to system faults and evaluate system performance. Ex-1002, ¶204.

POSITAs would have had a reasonable expectation of success in implementing a second TCP/IP port for monitoring because the TCP/IP protocol suite is commonly-known and POSITAs recognize how to set up TCP/IP ports, including for purposes of transmitting system status information. Ex-1002, ¶205. As discussed above, Avellan already contemplates use of TCP/IP and implementing a second socket for monitoring status would not require altering Avellan's operation. Ex-1004 at 1:14-16; Ex-1002, ¶205.

As a result, Avellan in view of Wannamaker renders claim 25 obvious.

L. Ground 12: Claim 26 is anticipated by Avellan.

Preamble 26 and Elements 26a-26e

Preamble 26	A computer-implemented method comprising at a caching unit:
Element 26a	receiving, from a content provider, a request for at least one media stream for playback on a broadcast media channel, wherein the at least one media stream includes a plurality of multimedia items of different types;
Element 26b	obtaining content corresponding to the plurality of multimedia items from at least one source offering the content in at least one first format;
Element 26c	rendering a web page by a browser using the content;
Element 26d	generating a temporal sequence of screen captures of the rendered web page, where each screen capture defines all the content of the web page at a given time, and at least two adjacent screen captures illustrate a dynamic change of at least a portion of the content over time;
Element 26e	assembling the at least one media stream using the temporal sequence of screen captures;

For the same reasons discussed in Ground 6 for Preamble 10 and Elements 10b-10f, Avellan discloses the corresponding language of Preamble 26 and Elements 26a-26f.

Element 26f

Element 26f	at a multicasting unit that is operable connected to the caching unit: providing the at least one media stream to the content provider for broadcast on the broadcast media channel;
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For the same reasons in Ground 6 (Element 10g), Avellan discloses Element 26f. Avellan further discloses a multicasting unit and states that “users may decide to join a multi-cast group, and communications unique to that group would be transmitted to those user computers 104₁-104_n over that multi-cast channel.” Ex-1004 at 12:11-18. Accordingly, Avellan teaches Element 26f.

Element 26g

Element 26g	recording the media stream from the caching unit to produce a recorded media stream; and
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Avellan teaches Element 26g.

Avellan can “store the compressed video format and the tag file in the gateway cache 136 at the gateway server 134.” Ex-1004 at 13:50-51. “By storing a portion or all of the gateway cache 136 at the gateway 134, the retransmission of video images associated with pages can be eliminated, which results in greater speed.” Ex-1004 at 12:23-26.

Element 26h

Element 26h	upon a fault being detected at the caching unit, providing at least a portion of the recorded media stream to the content provider.
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Avellan teaches Element 26h.

Avellan teaches that “preferably more than one server 134 stores Internet data in a cache 136 *for redundancy* and to better distribute communication channels for that server 134.” Ex-1004 at 9:55-57. POSITAs would recognize that Avellan therefore teaches that when a fault is detected at a caching unit, pre-recorded video images would be retrieved from memory associated with a different caching unit. Ex-1002, ¶208.

To the extent not explicitly disclosed by Avellan, it would have been obvious to combine Avellan and Wannamaker as discussed in Ground 13 below.

M. Ground 13: Claim 26 is obvious in view of Avellan and Wannamaker.

Element 26h

Element 26h	upon a fault being detected at the caching unit, providing at least a portion of the recorded media stream to the content provider.
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Wannamaker teaches that “[m]ultiple servers can be replicated within the application server, forming one logical server.” Ex-1013 at [0101]. “If a server fails, transactions are routed to another server in the server group.” Ex-1013 at [0101]. Wannamaker also teaches that each server “caches the converted content for future reuse.” Ex-1013 at [0270]. “The rendered 36 cache is a storage area for

content that has been converted into a particular form (MML).” Ex-1013 at [0236]. In response to a request, “[i]f valid content is in a rendered cache of one of the content processors, the cache manager [CM] immediately copies the content to the rendered caches” of each server. Ex-1013 at [0239]. “The application [then] uses the content, assured that the proper content is in the rendered cache.” Ex-1013 at [0242]. Thus, Wannamaker discloses caching rendered content for delivery and, in response to a server failure, routing the transaction to another server in the logical server group, which is able to retrieve the requested content from its own rendered cache for delivery.

POSITAs would have been motivated to combine Avellan and Wannamaker because providing a previously recorded media stream when a fault is detected promotes continuity of service and overall user experience, especially as compared to simply transmitting an error message to the user. Ex-1002, ¶210.

POSITAs would have had a reasonable expectation of success in combining Avellan and Wannamaker because both involve the same core idea of rendering web content and encoding it into a video frame format for delivery to a user, and like Wannamaker, Avellan already discloses caching streams across multiple servers. Ex-1002, ¶211. Thus, combining Avellan with Wannamaker’s recorded-playback disclosure would not require altering Avellan’s operation. Ex-1002, ¶211.

As a result, Avellan in view of Wannamaker renders claim 26 obvious.

IX. CONCLUSION

For the reasons above, Petitioners have established a reasonable likelihood that all Challenged Claims are unpatentable. Accordingly, Petitioners respectfully request institution of *inter partes* review and cancelation of the Challenged Claims.

Respectfully submitted,

Dated: December 23, 2024

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X. CERTIFICATE OF WORD COUNT

Pursuant to 37 C.F.R. §42.24(d), Petitioners hereby certify, in accordance with and reliance on the word count provided by the word-processing system used to prepare this petition, that the number of words in this paper is 13,921. Pursuant to 37 C.F.R. §42.24(d), this word count excludes the table of contents, table of authorities, mandatory notices under §42.8, certificate of service, certificate of word count, appendix of exhibits, and any claim listing.

Dated: December 23, 2024

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CERTIFICATE OF SERVICE

The undersigned certifies pursuant to 37 C.F.R. §§ 42.6(e) and 42.105(a) that on December 23, 2024, a true and correct copy of the foregoing “PETITION FOR INTER PARTES REVIEW” was served via Priority Mail Express on the Patent Owner at the following correspondence address of record as listed in the USPTO electronic filing system:

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and was served via electronic mail upon counsel of record for the Patent Owner in the litigation in the U.S. District Court for the Southern District of Florida:

Edwin A. Hernandez v. Stingray Digital Group, et al
Case No. 1:24-cv-21226-RAR

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