

UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE PATENT TRIAL AND APPEAL BOARD

GOOGLE LLC,

Petitioner,

v.

SONOS, INC,

Patent Owner.

Case No. IPR2025-01590
U.S. Patent No. 10,031,715

PETITION FOR *INTER PARTES* REVIEW

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EX-1001	U.S. Patent No. 10,031,715 (“the ’715 patent”)
EX-1002	Excerpts of File History of U.S. Patent No. 10,031,715
EX-1003	Declaration of Dr. David Anderson (“Decl.”)
EX-1004	Curriculum Vitae of Dr. David Anderson
EX-1005	U.S. Patent No. 7,269,338 to Janevski (“Janevski”)
EX-1006	U.S. Patent No. 7,114,172 to Lord (“Lord”)
EX-1007	U.S. Patent No. 7,421,478 to Muchow (“Muchow”)
EX-1008	U.S. Patent Application Publication No. 2001/0012757 to Boyle (“Boyle”)
EX-1009	U.S. Patent No. 6,910,078 to Raman et al. (“Raman”)
EX-1010	U.S. Patent No. 5,838,909 to Roy et al. (“Roy”)
EX-1011	WIPO Publication No. WO2003/093950 to Goldberg (“Goldberg”)
EX-1012	Infringement Contentions Claim Chart for the ’715 Patent in <i>Sonos, Inc. v. Google LLC</i> , No. 2:20-cv-00169 (C.D. Cal.)
EX-1013	U.S. Patent Provisional Application No. 60/490,768 (’768 application”)
EX-1014	U.S. Patent No. 7,707,300 to Champagne (“Champagne”)
EX-1015	U.S. Patent No. 7,908,388 to Grundstrom (“Grundstrom”)
EX-1016	U.S. Patent Application Publication No. 2004/0048569 to Kawamura (“Kawamura”)
EX-1017	U.S. Patent No. 5,010,399 to Goodman et al. (“Goodman”)
EX-1018	U.S. Patent No. 6,353,596 to Grossglauser et al. (“Grossglauser”)

Exhibit	Description
EX-1019	U.S. Patent Non-Provisional Application No. 10/816,217 ('217 application")
EX-1020	<i>Sonos, Inc. v. Implicit, LLC</i> , IPR2018-00766, Paper 1 (P.T.A.B.)
EX-1021	<i>Sonos, Inc. v. Implicit, LLC</i> , IPR2018-00767, Paper 1 (P.T.A.B.)
EX-1022	Infringement Contentions Cover Pleading in <i>Sonos, Inc. v. Google LLC</i> , No. 2:20-cv-00169 (C.D. Cal.)
EX-1023	Agreed Claim Constructions in <i>Sonos, Inc. v. Google LLC</i> , No. 2:20-cv-00169 (C.D. Cal.)
EX-1024	U.S. Patent No. 7,643,894 to Braithwaite et al. ("Braithwaite")
EX-1025	U.S. Patent No. 5,369,724 to Lim ("Lim")

I. Relief Requested

Google LLC (Petitioner) requests *inter partes* review of claims 1-3, 5-9, 11-15, and 17-18 of U.S. Patent No. 10,031,715 based on these grounds (Decl., ¶¶6-7):

Ground	Claim(s) Challenged	35 U.S.C. §	Reference(s)
1	1, 7, 13	103	Janevski, Muchow, and Kawamura
2	1, 7, 13	103	Janevski, Boyle, and Kawamura
3	2, 8, 14	103	Janevski, Muchow, Kawamura, and Raman
4A	3, 9, 15	103	Janevski, Muchow, Kawamura, and Roy
4B	3, 9, 15	103	Janevski, Boyle, Kawamura, and Roy
5A	5, 11, 17	103	Janevski, Muchow, Kawamura, and Goldberg
5B	5, 11, 17	103	Janevski, Boyle, Kawamura, and Goldberg
6A	6, 12, 18	103	Janevski, Muchow, Kawamura, and Lord
6B	6, 12, 18	103	Janevski, Boyle, Kawamura, and Lord

II. The '715 Patent

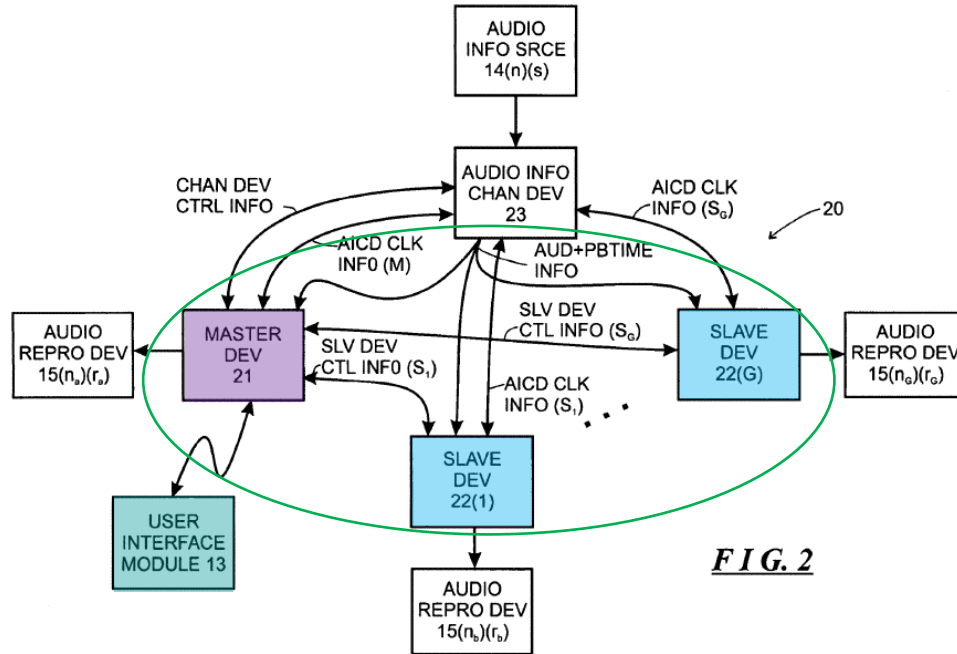
Sonos filed the '715 patent on Apr. 17, 2013, with a priority claim to Jul. 28, 2003. EX-1001, Cover Page.

A. Overview

The '715 patent relates to “synchronizing of audio playback as among two or more audio playback devices.” EX-1001, 1:24-35. The '715 patent discloses a “network audio system” including a “plurality of zone players.” *Id.*, 3:48-55. “[A] synchrony group 20 includes a master device 21 and zero or more slave devices ... all of which synchronously play an audio program.” *Id.*, 8:2-7. “The master device ... controls the operations of the slave devices 22(g) in the synchrony group.” *Id.*, 8:27-35.

“The master device 21 receives control information from the user interface module 13 for controlling the synchrony group,” which includes commands “to terminate playing of a current track,” “skip to the next track,” or “re-order tracks in a play list.” *Id.*, 9:5-9, 9:31-36.

“[T]he master device 21 can ... initiate a migration of the master from its zone player 11(n) to another zone player 11(n’),” for example, “if it is overloaded.” *Id.*, 13:22-36. The '715 patent specification does not provide any details on how migration is executed or any other examples of when master device role migration might be initiated.



Id., FIG. 2.¹

B. The '715 Patent Is Not Entitled to Priority Earlier than April 1, 2004.

The '715 patent is part of a chain of continuations of U.S. applications:

- No. 13/297,000 filed on Nov. 15, 2011;
- No. 10/816,217 filed on April 1, 2004.

Those applications claim priority to U.S. provisional application No. 60/490,768 filed on July 28, 2003. EX-1001, Cover Page.

While Patent Owner bears the burden of proving priority (*PowerOasis, Inc. v. T-Mobile USA, Inc.*, 522 F.3d 1299, 1305-06 (Fed. Cir. 2008)), the '715 patent

¹ All annotations and emphases added unless otherwise indicated.

claims have no right to priority to the '768 application because that application did not disclose:

- “evaluating one or more operational performance metrics ... and ... determining that the second zone player should perform the master device role for the synchrony group”;
- “in response to determining ... the first zone player initiating migration of the master device role”; or
- “after migration ... the first zone player (i) ceasing to perform the master device role,” as recited in independent claims 1, 7, 13. *See generally* EX-1001; EX-1013 ('768 provisional application).

Patent Owner cannot dispute this priority date because of its own admissions:

- Patent Owner alleges “each Asserted Claim of the '715 Patent is entitled to a priority date no later than April 1, 2004.” EX-1022 at 61.

Any possible support for these limitations was first added to non-provisional application No. 10/816,217 filed on April 1, 2004, and therefore the priority date is no earlier than April 1, 2004.² *See generally* EX-1019.

² Petitioner reserves the right to challenge the '715 patent's priority date in other jurisdictions.

III. Claim Construction

No claim constructions are necessary to resolve unpatentability. *Realtime Data, LLC v. Iancu*, 912 F.3d 1368, 1375 (Fed. Cir. 2019). Nonetheless, the Parties agreed to the following constructions, and the prior art discloses each of them. Decl., ¶¶54-57.

“zone player”	“data network device configured to process and output audio”
“network interface”	“physical component of a device that provides an interconnection with a data network”
“playback timing information”	“information indicating when the audio [information/content] is to be played back”
“synchrony group”	“a set of two or more zone players that are to play the same audio program synchronously”

EX-1023.

IV. Level of Ordinary Skill

A person of ordinary skill in the art (“POSITA”) at the time of the purported invention would have had the equivalent of a four-year degree from an accredited

institution in computer science, computer engineering, electrical engineering, or an equivalent thereof, and approximately four years of professional experience in the fields of networking and network-based systems or applications, such as consumer audio systems, or an equivalent level of skill, knowledge, and experience. Decl., ¶¶58-60. Additional education could substitute for professional experience, and significant work experience could substitute for formal education. *Id.*

V. Overview of Prior Art

The proposed grounds' references are prior art:

Reference	Filed	Published	Statutory Basis (pre-AIA)
U.S. 7,269,338 (“Janevski”) (EX-1005)	Dec. 11, 2001	Sept. 11, 2007	§ 102(e)
U.S. 7,114,172 (“Lord”) (EX-1006)	Jun. 28, 2001	Sept. 26, 2006	§ 102(e)
U.S. 7,421,478 (“Muchow”) (EX-1007)	Mar. 7, 2002	Sept. 2, 2008	§ 102(e)
U.S. 2001/0012757 (“Boyle”) (EX-1008)	Mar. 1, 2001	Aug. 9, 2001	§§ 102(a), (b), (e)
U.S. 2004/0048569 (“Kawamura”) (EX-1016)	Jun. 25, 2002	Mar. 11, 2004	§ 102(a)
U.S. 6,910,078 (“Raman”) (EX-1009)	Nov. 15, 2001	Jun. 21, 2005	§ 102(e)
U.S. 5,838,909 (“Roy”) (EX-1010)	May 23, 1996	Nov. 17, 1998	§§ 102(a), (b), (e)
WO2003/093950 (“Goldberg”) (EX-1011)	May 6, 2003	Nov. 13, 2003	§ 102(a), (e)

VI. Ground 1: Claims 1, 7, and 13 Would Have Been Obvious Over Janevski, Muchow, and Kawamura.

A. Janevski

Janevski relates to “synchronizing playback of two or more digital streams based on renderable content of those streams.” Janevski, 1:5-11. Janevski discloses “a **synchronized viewing session**” including “**PVRs 114a, b**.” *Id.*, 6:4-18. “[T]elelevision program” “broadcasts” “are received by receivers 113a, b housed within each of the respective PVRs.” *Id.* “The presentation may be ... aural.” *Id.*, 16:34-43. And “**remote control 116a, b** ... allow[s] the user to operate the **personal video recorder 114a, b** remotely.” *Id.*, 6:39-44.

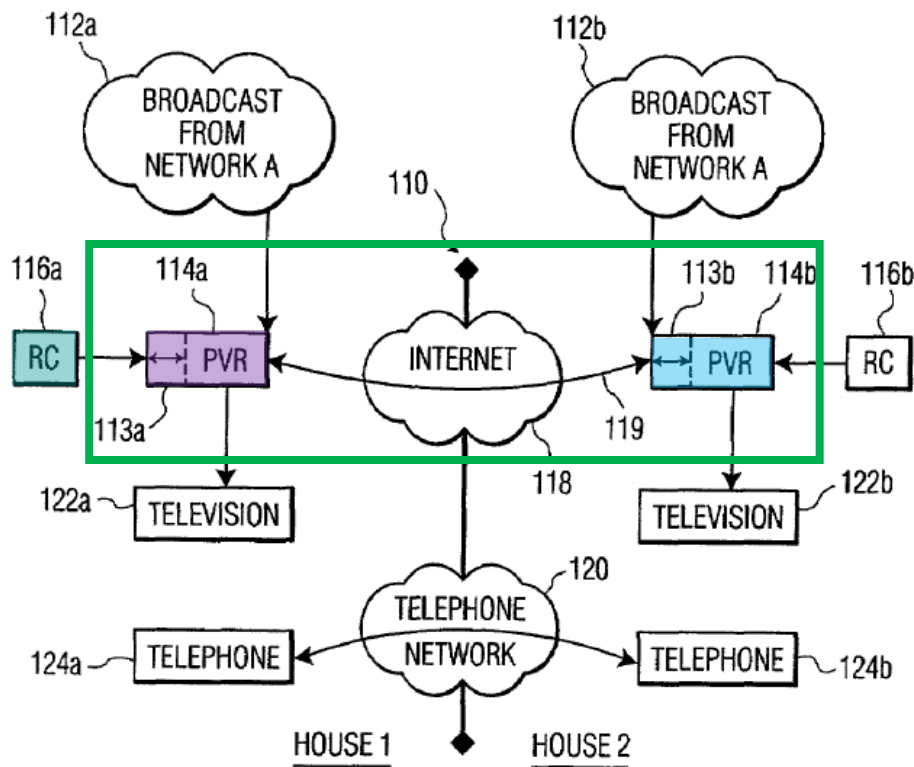


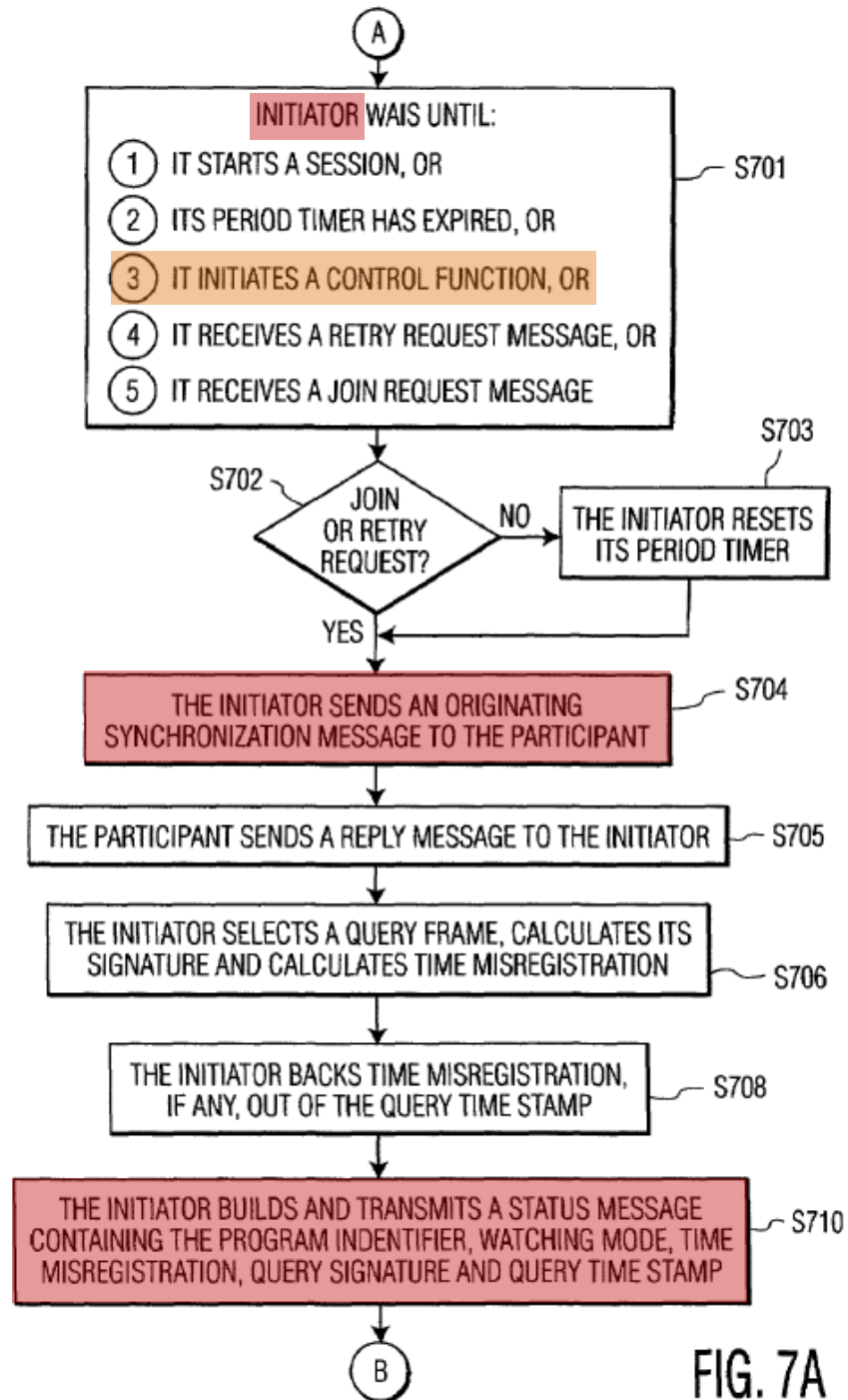
FIG. 1

Id., FIG. 1.

A session user can “execute[] a **control function**” which “changes the watching mode,” “(e.g., **start, pause, rewind, fast forward**).” *Id.*, 7:31-36, 8:48-52, Abstract.

“The **initiator** [PVR] **directs all participants** ... upon execution of each control function, and periodically, **to synchronize their playbacks to that of the initiator.**” *Id.*, Abstract. “To ensure that the PVRs 114a, b participating in a session remain synchronous, a status message is sent out periodically by the ‘**initiator**,’ i.e., the PVR 114a.” *Id.*, 7:36-50. When “the role of **initiator** is handed off,” Janevski explains that

“another participant 114b assumes the role of initiator PVR 114a.” *Id.*, 6:16-25, 7:51-57, 15:32-43.



Id., FIG. 7A.

Like the '715 patent, Janevski is in the technical field of controlling synchronous audio playback. *Compare* EX-1001, 1:25-45, 2:35-48, 5:33-39, with Janevski, 1:5-11, 5:3-43; Decl., ¶¶66.

B. Muchow

Muchow relates to “applications using a master-slave configuration” and a “method that can provide efficient failure recovery ... between nodes of a networked computer system.” Muchow, 1:9-15, 2:51-53. Each “node” is “a distinct processing element of a computer system.” *Id.*, 3:61-67. “Each node 102 includes **one or more processors** and **one or more external network interfaces**.” *Id.*, 4:28-35.

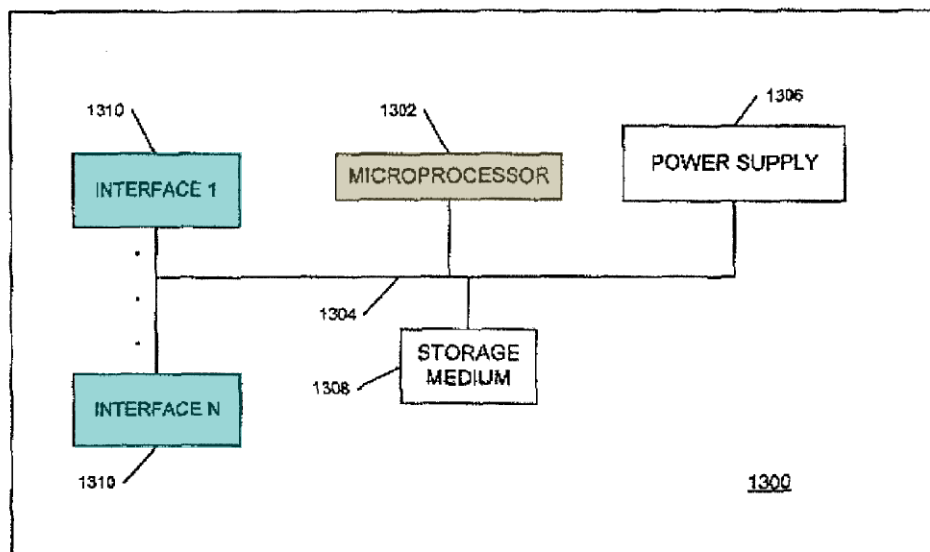
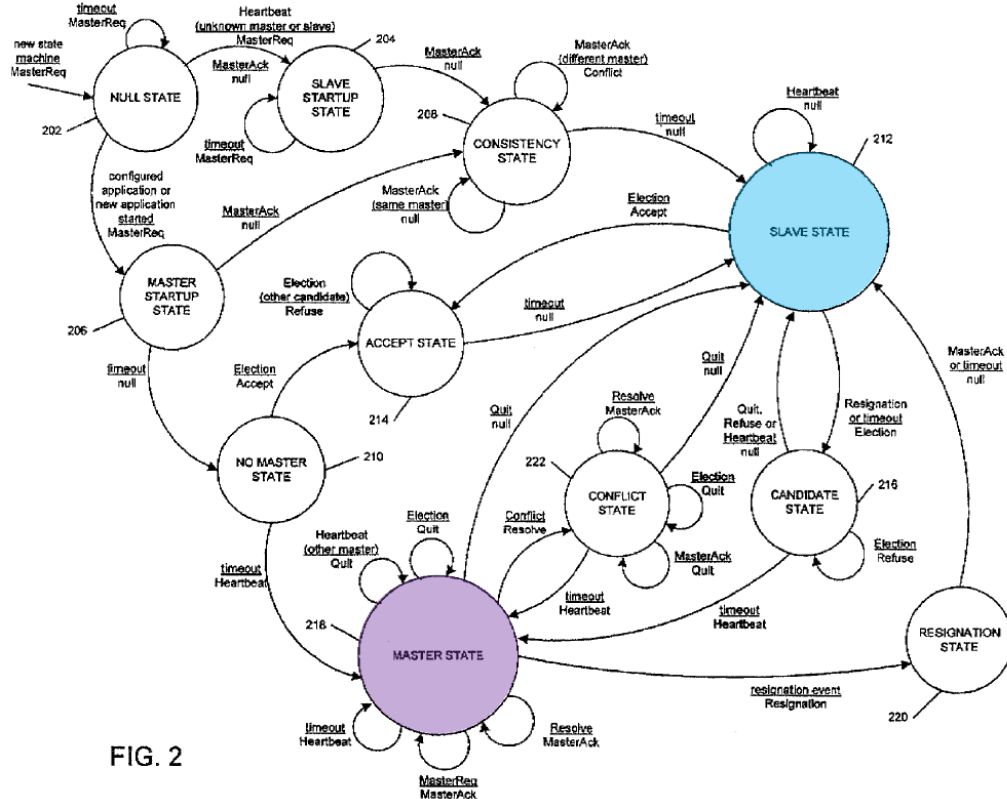


FIG. 13

Id., FIG. 13.

A node that “run[s]” “an application instance is considered a ‘master’ for that application instance, and all other nodes 102 are considered ‘slaves.’” *Id.*, 4:54-58. An “application instance” is “any node function ... whose communications relating to master-slave operation are being managed by a main task.” *Id.*, 5:10-14.



Id., FIG. 2.

A “monitor task” “monitor[s] the operation of the node itself and/or various functions or components associated with the node (e.g., the CPU ...).” *Id.*, 26:56-67.

“[T]he monitor task ... determines the health and/or operational status,” and “determines whether a problem ... indicates that the health and/or operational status of one or more application instances is degraded.” *Id.*, 27:15-60.

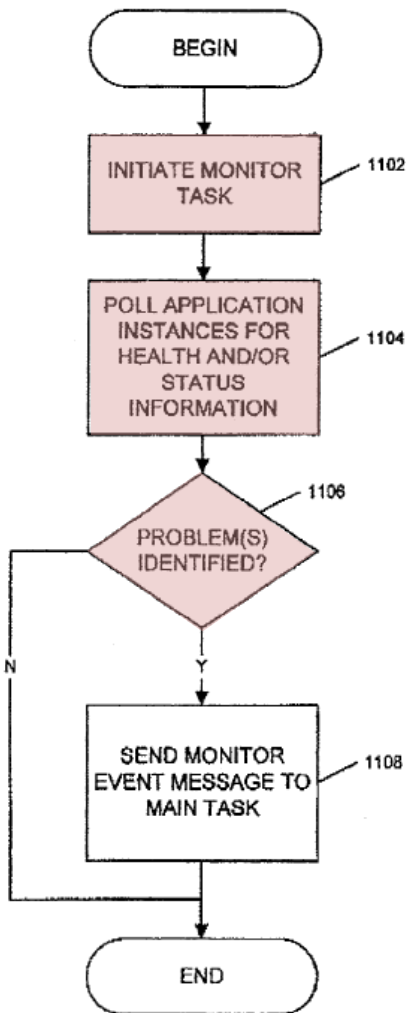


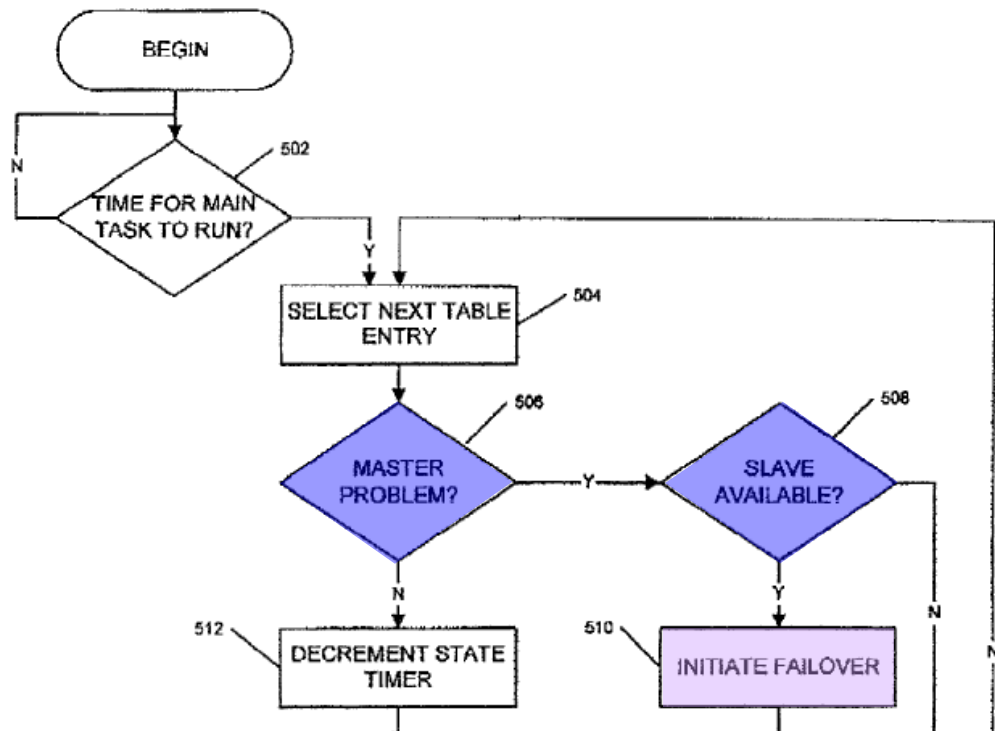
FIG. 11

Id., FIG. 11.

Next, “[a] determination is then made, ... whether ... a problem has occurred with the master.” *Id.*, 16:7-28. If “a problem has occurred, then a determination is

made, ... whether a slave is available to take over master operations.” *Id.*, 16:29-41.

“If a slave is available, then the node initiates a failover.” *Id.*



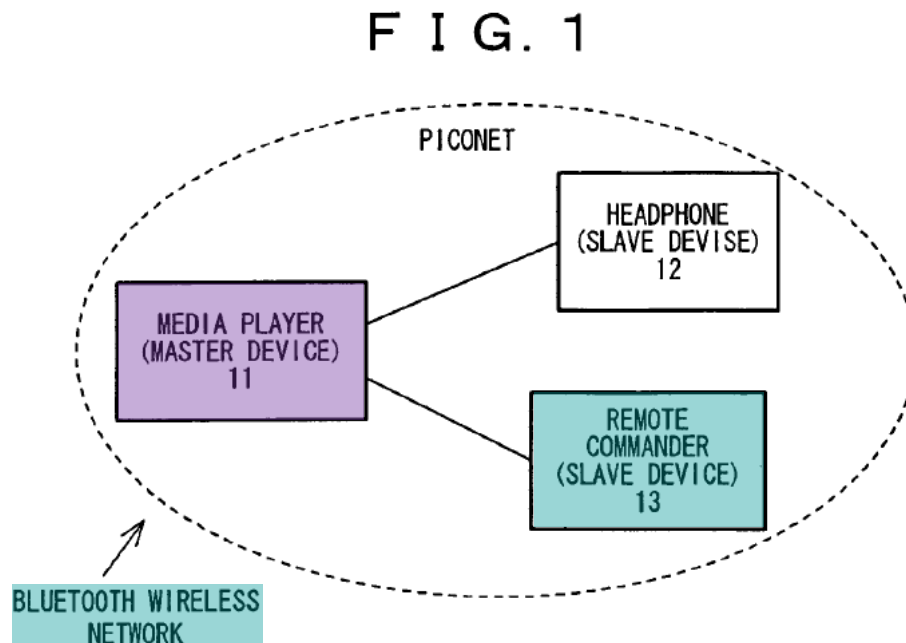
Id., FIG. 5 (excerpted).

Muchow is in the same technical field as the '715 patent because it is reasonably pertinent to the problem faced by the inventor: detecting failovers and migrating the master role. *Compare* EX-1001, 8:41-9:4, 10:60-11:4, 13:22-36, 16:3-26, *with* Muchow, 1:19-2:58, 3:55-60, 4:61-5:2, 11:33-45, 11:59-12:44; Decl., ¶72. “Because of the matter with which [Muchow] deals” (fault tolerant master-slave systems), Muchow “logically would have commended itself to an inventor’s attention in considering his problem.” *In re ICON Health and Fitness, Inc.*, 496 F.3d 1374, 1379-80 (Fed. Cir. 2007).

C. Kawamura

Kawamura relates to “exchanging device operating commands between [] devices within a piconet ... implemented by the Bluetooth™ standard.” Kawamura, [0002].

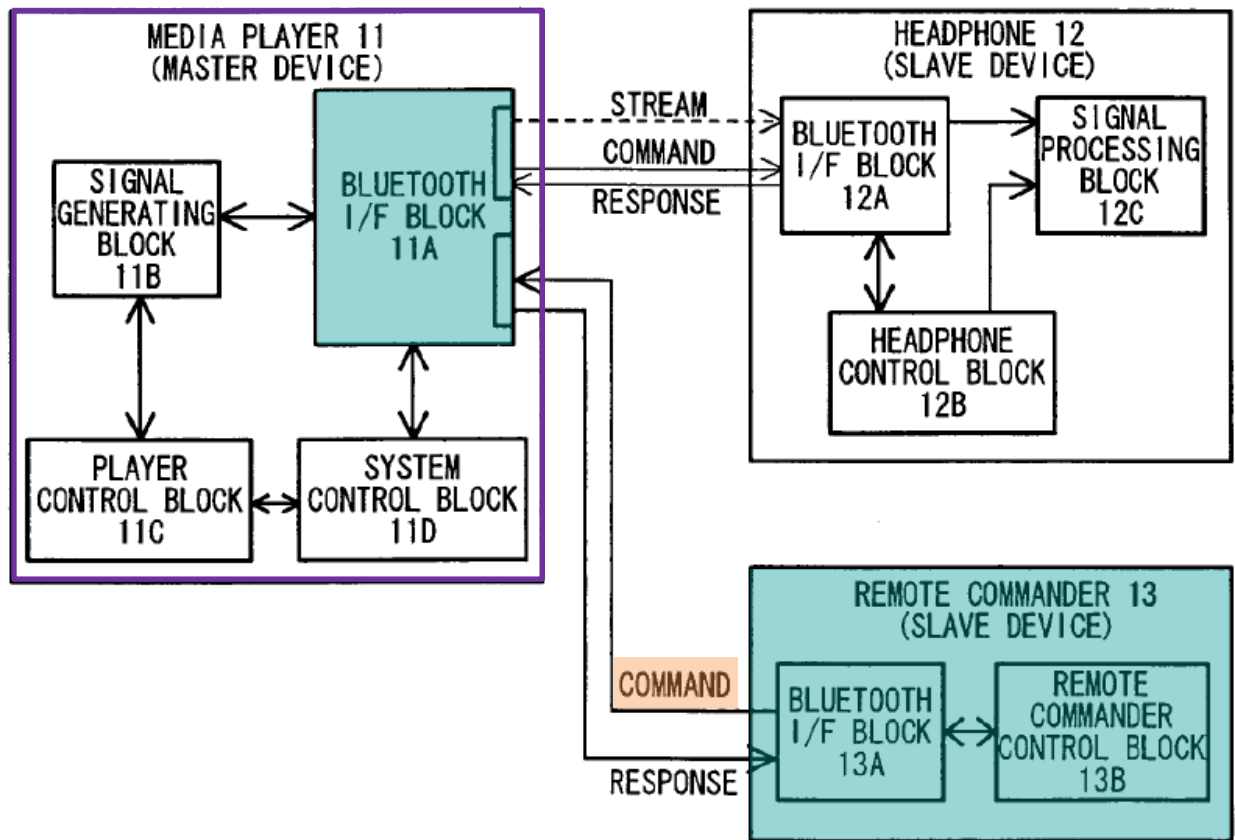
Kawamura discloses a “piconet” containing a “media player” and “remote commander.” *Id.*, [0088]. “The remote commander 13 remotely controls the media player 11 for executing play control such as play[or] stop.” *Id.*



Id., FIG. 1.

Kawamura’s “media player” includes “a Bluetooth interface” which “transfers commands and responses” with the remote commander. *Id.*, [0090]-[0091].

FIG. 2



Id., FIG. 2.

Like the '715 patent, Kawamura is in the technical field of controlling audio playback. *Compare* EX-1001, 9:5-36, claims 1, 7, 13, *with* Kawamura, [0088], [0206]; Decl., ¶76.

D. Independent Claims

Janevski teaches most of claim 1, including multiple PVRs, a PVR performing the initiator role to control synchronous playback, and handing off that initiator role. Janevski, Abstract, 6:4-26, 15:43-47; Decl., ¶77. Muchow teaches a fault tolerant

system that monitors system performance to determine whether to migrate a master role. Muchow, 1:19-25, 2:51-58, 3:55-60; Decl., ¶77. Finally, Kawamura teaches Bluetooth controllers for home entertainment systems. Kawamura, [0088]-[0091]; Decl., ¶77. Claim 1 would have been obvious over the combination of Janevski, Muchow, and Kawamura. Decl., ¶77.

1. Claim 1

a. [1preamble]: “A method comprising:”

Janevski’s “method for synchronizing presentation from bit streams based on their content” discloses [1preamble]. Janevski, 1:1-3 (capitalization altered), 1:8-11, 13:22-23, 17:7-16; Decl., ¶78.

b. [1ai]: “a first zone player performing a master device role for a synchrony group comprising the first zone player and a second zone player,”

Janevski discloses [1ai] because “PVR 114a” (first zone player) and “PVR 114b” (second zone player) form a “synchronized viewing session” (synchrony group), where the “PVR 114a” (first zone player) performs an “initiator” (master device) role. Janevski, 1:13, 6:13-27, 7:57-62, 8:42-47, FIG. 1; Decl., ¶79.

Janevski’s “[p]ersonal video recorder (PVR)” “114a” discloses a first zone player. *Id.* Janevski’s “[p]ersonal video recorder (PVR)” “114b” discloses a second zone player. *Id.* Each “PVR” describes a zone player because they are “playback” devices that “playback ... renderable content,” including “visual” and/or “aural”

information. Janevski, Abstract, 1:8-11, 2:23-45, 5:24-32, 6:5-11, 6:45-58, 10:30-35, 15:22-26, 16:33-52; Decl., ¶80.

Janevski's PVRs meet the construction of "data network device configured to process and output audio" because each PVR is connected to the "Internet" network and is configured to "decompress[]" a "digital bit stream" (process) and "playback" content (output audio). *Id.*; Decl., ¶81; EX-1023.

The "PVR" "114a" and "PVR" "114b" playback audio content in "a synchronized viewing session," which discloses a synchrony group comprising the two zone players "PVR" "114a" and "114b." Janevski, 6:4-38, FIG. 1; *id.*, Abstract, 5:50-51, 7:4-16, 7:25-50, 11:4-11, 12:41-46; Decl., ¶82.

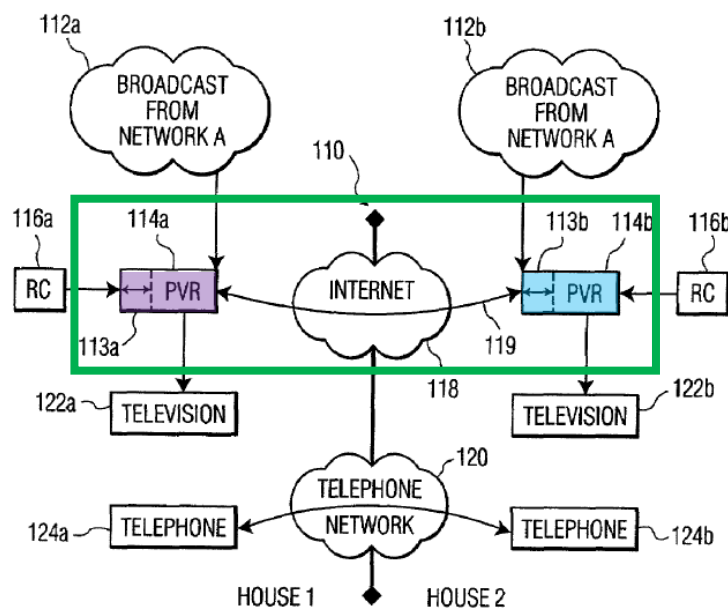


FIG. 1

Janevski, FIG. 1. Janevski's "synchronized viewing session" meets the construction of "a set of two or more zone players that are to play the same audio program synchronously" because each PVR is a zone player which "view[s] the same program" in sync. Janevski, 2:6-11, 5:7-19, 6:4-18, 12:41-46; Decl., ¶82; EX-1023.

Janevski further discloses that the "PVR" "114a" performs the "initiator" "role" for the "synchronized viewing session." Janevski, Abstract, 6:16-27, 8:39-52; Decl., ¶83. The PVR which performs the "initiator" role discloses a device performing the master device role as explained below for [1aii]. *Infra* Ground 1, [1aii]; Decl., ¶83.

- c. [1aii] "wherein in the **master device role**, the **first zone player** is **configured to control synchronous playback of audio information** by both the **first zone player** and the **second zone player** in response to playback commands received from a controller device via a network interface of the first zone player,"

Element [1aii] would have been obvious over the combination of Janevski and Kawamura. Decl., ¶84. First, Janevski discloses most of [1aii] because it's "PVR 114a," when set as the **initiator** (**first zone player** in **master device role**), "**directs all participants** [including PVR 114b (the second zone player)] ... **to synchronize their playbacks to that of the initiator**," "**upon execution of each control function**" (**in response to playback commands**) received from "**remote control 116a**" (**controller device**). Janevski, Abstract, 6:39-44, 7:36-50; Decl., ¶84. Kawamura teaches that it

was known to receive commands from a “remote commander” (remote) via a “Bluetooth interface” (via a network interface of the first zone player). Kawamura, [0088]-[0090]; Decl., ¶84.

Master Device Role: As explained for [1ai], “PVR” “114a” performs the “initiator” role for the “synchronized viewing session.” *Supra* Ground 1, [1ai]; Decl., ¶85. The “initiator” role discloses a master device role that controls synchronous playback because “[t]he initiator directs all participants ... to synchronize their playbacks to that of the initiator, whereby all playbacks are synchronized and maintain[ed] in synchronization.” Janevski, Abstract, 6:16-27, 7:25-50, 8:39-52, 8:65-9:4, 11:12-42, 15:32-33, 16:34-43; Decl., ¶85.

To control synchronization, “a status message is sent out periodically by the ‘initiator’, i.e., the PVR 114a” “[t]o ensure that the PVRs 114a, b participating in a session remain synchronous.” Janevski, 1:53-2:5, 7:39-50; Decl., ¶86. “The status message includes” information to ensure synchronized playback like “the current mode of watching (e.g., normal play, fast forward, pause), an indication of the time

into the program, and information characteristic of content of a digital bit stream.”

*Id.*³

Janevski discloses synchronizing playback of audio information because it “applies generally to synchronizing presentation of renderable content” which “may be ... aural.” Janevski, 6:16-27, 16:34-43; Decl., ¶87.

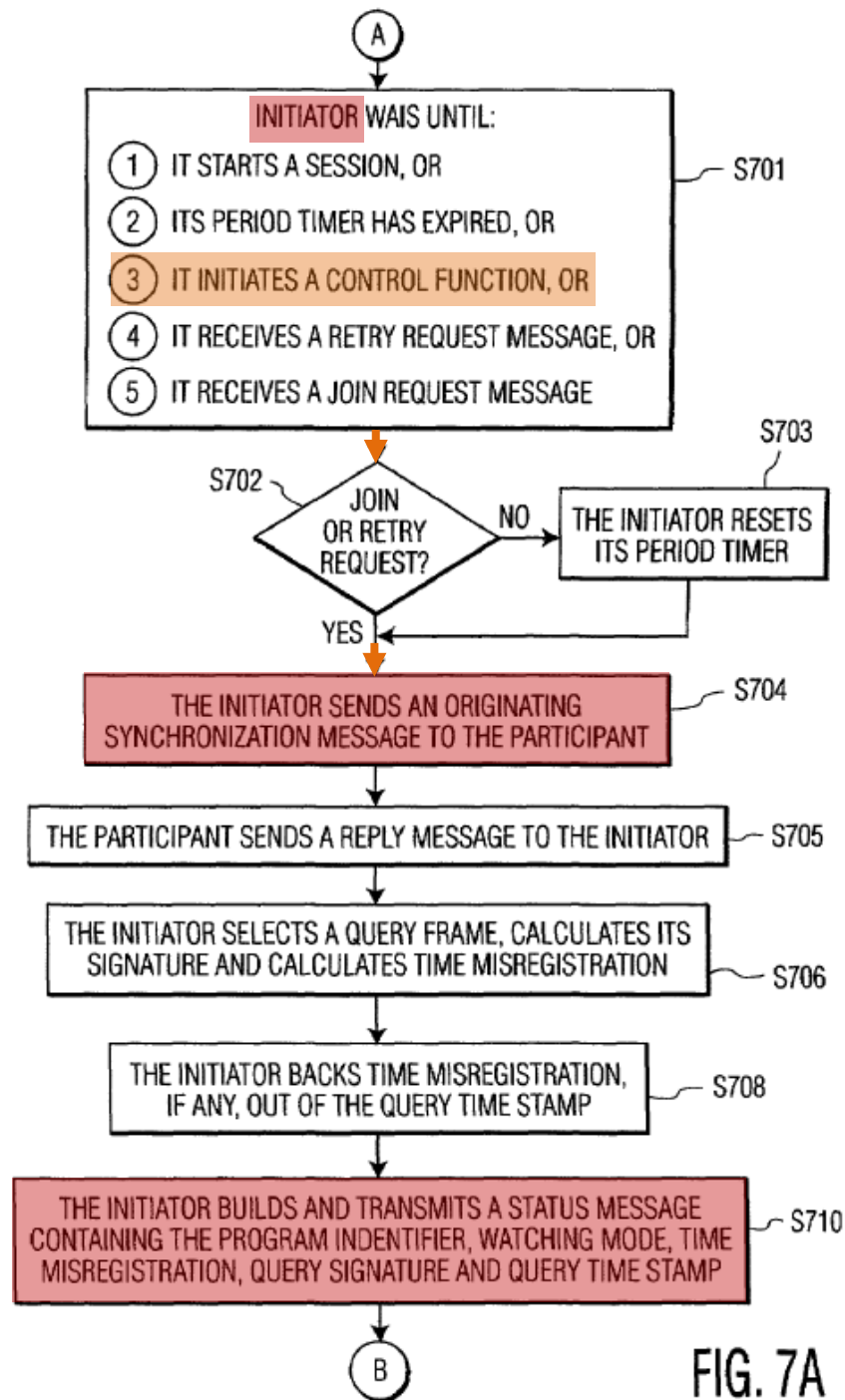
In Response to Playback Commands: Janevski discloses “control function[s],” such as “stop, pause, fast forward, [and] reverse,” which are playback commands because they control playback. Janevski, 1:60-2:5, 6:18-22, 7:31-36, 7:43-44, 8:49-50, Abstract; Decl., ¶88. For example, “fast forwards” means “moves forward in the video 308 faster than the video moves in normal play.” Janevski, 14:34-43; Decl., ¶88.

The “initiator” controls synchronous playback in response to the “control function” because “[t]he initiator directs all participants ... ***upon execution of each control function*** ... to synchronize their playbacks to that of the initiator, whereby all playbacks are synchronized and maintain[ed] in synchronization.” Janevski, Abstract; Decl., ¶89. Also, “the initiation of a control function” is a “***triggering***

³ Sonos admitted “Janevski’s ‘initiator’ PVR amounts to ... [a] ‘master device’ ... and Janevski’s one or more ‘participant’ PVRs amount to ... [‘]slave devices.’” EX-1020 at 40; EX-1021 at 36-37.

event[] for the synchronization process,” upon which “the initiator PVR 114a synchronizes with all participant PVRs 114b.” Janevski, 7:25-50, 11:31-51, 11:12-12:4, 12:30-36; Decl., ¶89.

As illustrated below, “initiat[ing] a control function” begins the synchronization process explained above. Janevski, FIG. 7 (capitalization altered), 7:39-50; Decl., ¶90.



Janevski, FIG. 7A.

Received from a Controller Device Via a Network Interface: Janevski at least suggests receiving the playback commands from a controller device via a

network interface because Janevski discloses a “remote control 116a, b to allow the user to operate the personal video recorder 114a, b remotely.” Janevski, 6:39-44; Decl., ¶91. The “remote control” is a controller device, as shown in Figure 1. *Id.*

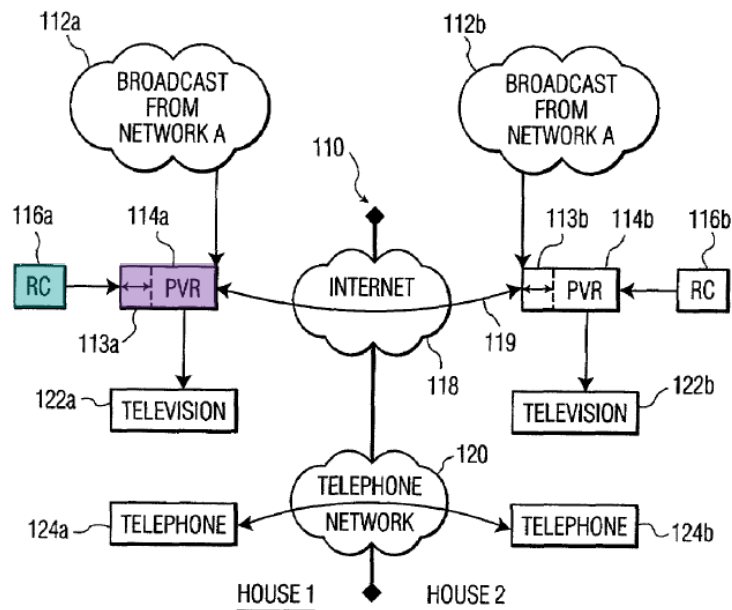


FIG. 1

Janevski, FIG. 1.

Janevski also discloses that “PVR 114a includes a receiver 113a,” which is a network interface because it connects to the “Internet” network to receive “broadcasts” and communicate with other PVRs. Janevski, 6:5-16, 6:45-48, 7:57-59; Decl., ¶92.

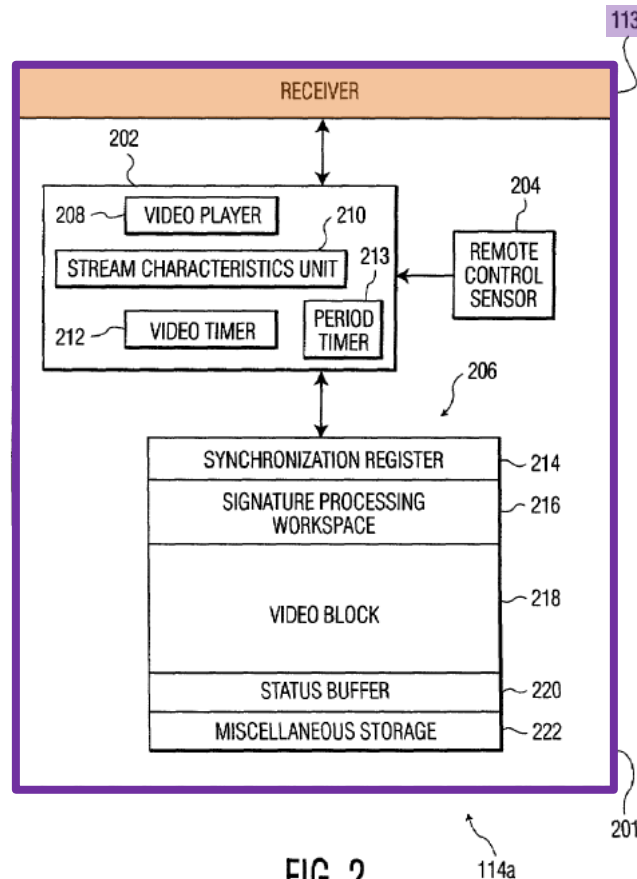
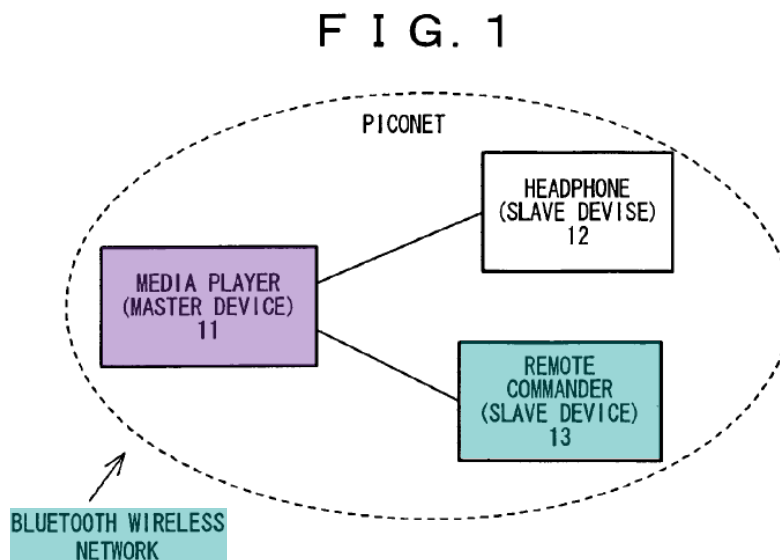


FIG. 2

Janevski, FIG. 2.

In Janevski’s exemplary embodiment, the “exemplary PVR 114a includes ... a remote control sensor 204,” which “receives a signal from the remote control 116a.” Janevski, 7:51-8:1; Decl., ¶93. But Janevski is expressly not limited to this configuration, and while Janevski contemplates that its “remote control” is “typically” “configured to transmit an infrared signal to the television 122a, b,” a POSITA would have understood other wireless communication techniques were compatible with and advantageous for Janevski’s system. Janevski, 6:40-44; Decl., ¶93.

Kawamura discloses one known suitable option to replace infrared—Bluetooth. Kawamura’s Bluetooth “piconet 10” includes “media player 11 ... and a remote commander 13.” Kawamura, [0088], [0090]-[0091], FIGs. 1, 2; Decl., ¶94. Within the piconet, “[t]he remote commander 13 remotely controls the media player 11 for executing play control such as play, stop, pause, fast forward and rewind,” which discloses a controller device transmitting playback commands to the media player. *Id.*

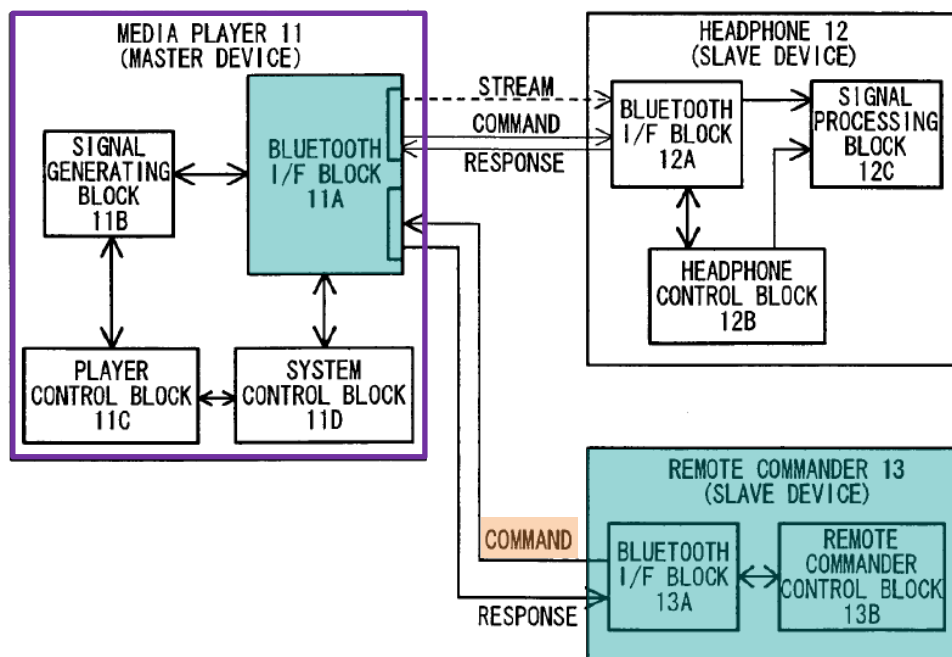


Kawamura, FIG. 1.

Kawamura’s “media player” includes “a Bluetooth interface,” which is a network interface that connects to the “Bluetooth wireless network.” Kawamura, [0090]-[0091], FIGs. 1-2; Decl., ¶95. The “Bluetooth interface” of “media player” implements “Bluetooth wireless connection in the piconet 10 and transfer[]

commands and responses with the ... [remote commander] 13.” *Id.* Kawamura’s “remote commander” similarly includes “a Bluetooth interface” which “transfers commands and responses with the [media player] 11.” Kawamura, [0100]-[0104]; Decl., ¶95. Kawamura’s “media player” (zone player) receives “commands” (playback commands) from the “remote commander” (controller device) via the “Bluetooth interface” (network interface). Kawamura, [0088], [0090]-[0091]; Decl., ¶95.

F I G. 2



Kawamura, FIG. 2.

As combined, Kawamura’s “remote commander” would have served as Janevski’s “remote control” and Janevski’s “PVR 114a” would have received its “control function” via Kawamura’s “Bluetooth interface.” Decl., ¶96. Element

[1aiii] recites “at least one network interface,” and is compatible with including both Kawamura’s Bluetooth network interface and Janevski’s existing Internet network interface in the PVR. Decl., ¶96; *infra* Ground 1, [1aiii].

A POSITA would have sought Bluetooth solutions because Kawamura teaches that “short-distance wireless communication,” including “Bluetooth,” is “expected a great deal” for use “as the transmission media for home networks.” Kawamura, [0003]-[0005]; Decl., ¶97. Kawamura also teaches that “obviously, [Bluetooth] is also designed for the application to stationary equipment” including “a stereo unit (or other media players).” Kawamura, [0010]; Decl., ¶97.

A POSITA would have recognized that infrared communications (as in Janevski’s exemplary embodiment) are limited to line-of-sight transmission. Decl., ¶98. For example, the prior art explains that “[m]any video sources, especially VCRs and cable converters, are designed to cooperate with hand-held controllers that send out infrared control signals upon command of the user,” but “[u]nfortunately signals from these devices do not travel between rooms unless there is a line-of-sight path between transmitter and source.” Goodman, 4:43-49; Braithwaite, 1:54-60; Decl., ¶98. A POSITA would have been motivated to implement Kawamura’s Bluetooth remote to advantageously improve communications and successfully transmit commands to Janevski’s PVR even when walls, furniture, people, or other household obstacles obstruct the line-of-sight. Decl., ¶98.

A POSITA would have reasonably expected success because Janevski and Kawamura use similar components in similar ways to achieve similar goals, e.g., AV media players, control signals, and remote controllers. Kawamura, [0088]-[0091], [0206]; Janevski, 6:4-44; Decl., ¶99. Moreover, “because Bluetooth is a worldwide standard ... the globalization of communication environments may be promoted with ease.” Kawamura, [0011]; Decl., ¶99. Kawamura also uses “a conventional Bluetooth control profile.” Kawamura, [0023]; Decl., ¶99. Janevski’s “PVR 114a” is already configured with an Internet network interface (“receiver[] 113a”) as explained above. Janevski, 7:57-62; 6:5-16; Decl., ¶99. Implementing this scheme in Janevski (to the extent not expressly disclosed) would have used known features according to their known functions (remote controls and Bluetooth), to achieve predictable results (Janevski’s PVR receives the control function via a Bluetooth interface). Decl., ¶99.

Janevski’s “receiver” and Kawamura’s “Bluetooth interface” meet the construction of “physical component of a device that provides an interconnection with a data network” because they are physical components that connect to the “Internet” and “Bluetooth” networks, respectively. Janevski, 7:57-62; 6:5-16; Kawamura, [0088]-[0091]; Decl., ¶100; EX-1023.

- d. [1aiii] “wherein the **first zone player** comprises **one or more processors** and **at least one network interface**,”

Element [1aiii] would have been obvious over the combination of Janevski and Kawamura. Decl., ¶101. Janevski discloses that “PVR 114a” comprises a “**microprocessor 202**” (**one or more processors**) (Janevski, 7:57-62; Decl., ¶101) and a network interface “receiver 113a,” as explained for [1aii] (*Supra* Ground 1, [1aii]; Decl., ¶101). It also would have been obvious to include Kawamura’s “Bluetooth interface” (which is a network interface) in Janevski’s “PVR,” as explained for [1aii]. *Supra* Ground 1, [1aii]; Decl., ¶101.

- e. [1bi]: “while performing the **master device role**, the **first zone player** (i) **evaluating one or more operational performance metrics** of the one or more **processors** or the at least one **network interface** **indicating potential degradation in performance of synchronous playback of information content** by both the **first** and **second zone player**, and”

Element [1bi] would have been obvious over the Janevski-Kawamura system in combination with Muchow. Decl., ¶102. As discussed above, Janevski discloses “PVR 114a” (**first zone player**) and “PVR 114b” (**second zone player**), where the “PVR 114a” performs an “**initiator**” (**master**) role. *Supra* Ground 1, [1ai]-[1aii]; Decl., ¶102. Janevski also discloses that “the role of **initiator** [can be] handed off,” but does not disclose doing so as part of a fault tolerant system. *Id.* Janevski confirms that a POSITA would have sought solutions to reduce “synchronization errors”

because some are “significant and interfere with viewing enjoyment.” Janevski, 3:40-45; Decl., ¶102. Muchow provides implementation details for a handoff process that makes a system fault tolerant, including handoff based on CPU or network performance to avoid degraded operation (e.g., synchronization errors). Decl., ¶102.

Muchow discloses all limitations of [1bi] except that devices are “zone players” and the application is “synchronous playback.” *Id. First*, in Muchow, “[e]ach node executes a ... ‘main task,’” including the **master** node. Muchow, 5:3-14; Decl., ¶103. This “main task” on the master node can incorporate “the functionality of the monitor task.” Muchow, 27:19-21; Decl., ¶103. *Second*, the “monitor task” “**monitor[s]** ... for correct operation” by “**check[ing]**” (**evaluating**) “**criteria**” (**operational performance metrics**) of “components associated with the node,” such as the “**CPU**” (**processor**) or “**network interface[]**” (**network interface**). Muchow, 4:28-36, 5:3-14, 11:33-42, 26:56-62, 12:11-16, 27:1-21; Decl., ¶103. The master node performs this evaluation because a “node determines that it should no longer operate as a master.” Muchow; 3:55-60; Decl., ¶103.

The “check” in Muchow meets the claimed evaluation. Decl., ¶104. “[T]he monitor task ... can ... call the operating system to check some operating system criteria.” Muchow, 12:11-16; *id.*, 27:1-14 (the “monitor task ... check[s] the value of a sensor” and “check[s] certain performance metrics”); Decl., ¶104. While the

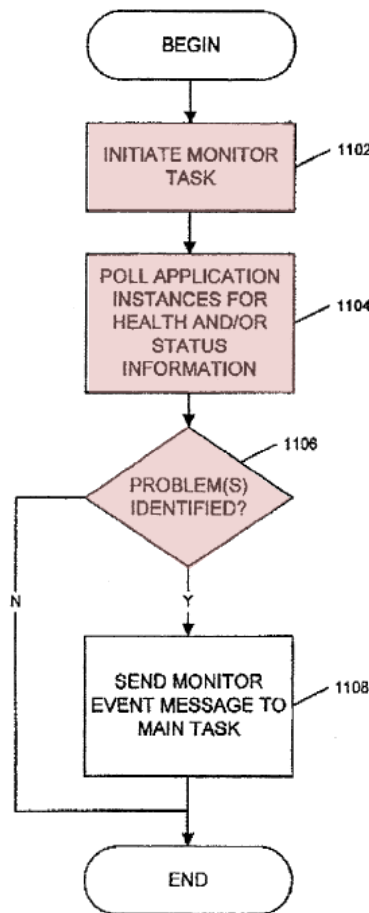
'715 patent's specification does not use the term "evaluation," a POSITA would have understood that evaluation is the process of assessing something against a set of standards—known as criteria. Decl., ¶104. Checking whether a criterion is met measures the subject's alignment with that standard and constitutes an evaluation. *Id.*

Muchow's "checked" criteria include **operational performance metrics** of the one or more **processors** or the at least one **network interface**. *Id.* Muchow determines health and operational status using "criteria," which disclose operational performance metrics because they (i) "indicate[]" "application instance health," (ii) "indicate that the operating system is functioning below an acceptable level," and (iii) indicate that "the application instance is not running properly according to the criteria." Muchow, 11:33-45, 12:5-18; Decl., ¶105. Exemplary "criteria" include that max temperature and "system throughput." *Id.*; Muchow, 27:1-14 (describing "the value of a sensor that measures the temperature of the node[or] component" and "performance metrics[] such as operating system throughput").

A POSITA would have understood "system throughput" to include—or at least suggest—CPU (i.e., a processor) and network performance in Muchow. Decl., ¶106. This is because its "monitor task can monitor the operation of" "components associated with the node," including the "CPU." Muchow, 26:56-62; Decl., ¶106. Although not specifically listed in the exemplary list of monitored "components,"

Muchow's "network interface[]" is also a "component[]" associated with the node" because "[e]ach node 102 includes ... one or more external network interfaces." Muchow, 4:28-36, 26:56-62 (exemplary list ends with "etc."); Decl., ¶106. "[C]riteria" that indicate the "CPU" "health" or the "network interface[]" "health" and performance correspond to operational performance metrics of one or more **processors** or the at least one **network interface**. Muchow, 11:33-45; Decl., ¶106.

Muchow also discloses that the monitoring serves to avoid potential degradation of an application's performance. Decl., ¶107. To do this, Muchow's "monitor task" "checks to see how the various application instances in the master state are running" "according to the criteria." Muchow, 11:33-45; Decl., ¶107. Figure 11 illustrates that "the monitor task polls ... and determines the health and/or operational status" (block 1104) and "determines whether a problem has been identified in block 1104 or otherwise, which indicates that the health and/or operational status of one or more application instances is degraded" (block 1106). Muchow, 27:15-60; Decl., ¶107.



Muchow, FIG. 11.

It would have further been obvious that Muchow’s determination “that the health and/or operational status ... [is] degraded” indicated degradation in performance of synchronous playback by both Janevski’s “PVR” “114a” (first zone player) and “114b” (second zone player). Muchow, 27:31-39, 27:49-60; Janevski, 6:13-27; Decl., ¶108. Synchronous playback is dependent on network and processor performance, and thus, degradation of the operational status or health of these components degrades the synchronous playback. Decl., ¶108. First, Janevski’s

“microprocessor” manages synchronous playback. Janevski, Abstract (“time is synchronized among the processors that participate in a synchronized viewing session,” “content-wise alignment is achieved by means of a status message between processors”), 7:20-24 (“a processor preferably reside[s] in either the PVRs 114a, b” and “[p]rogramming code associated with the system 110 preferably ... is processed by the processor”); Decl., ¶108. Second, Janevski’s Internet network interface “receiver 113a” receives audio and video programming from the “Internet” and Janevski’s “Internet network” is used “for communicating information between the PVRs 114a, b such that synchronization may be achieved.” Janevski, 6:4-38, 6:45-58, 7:57-59; *supra* Ground 1, [1aii]; Decl., ¶108.

As combined, Janevski’s “initiator” “PVR 114a” would have implemented Muchow’s “monitor task” to evaluate the “criteria” associated with the “CPU” and “network interface[.]” Decl., ¶109. A POSITA would have understood that, as combined, an unacceptably functioning processor indicates the potential degradation in performance of synchronous playback between Janevski’s “initiator” and “participant” “PVR” because a processor failure would result in no control over synchronous playback. Muchow, 11:35-42, 12:5-13, 15:5-13, 26:59-61; Janevski, Abstract, 8:53-64, 11:52-13:7 (explaining the processor’s role in synchronization); Decl., ¶109. This matches ’715 patent claim 2, which defines the “evaluating one or more operational performance metrics of the one or more processors” as

“determining that at least one of the one or more processors of the first zone player is overloaded.” EX-1001, claim 2; Decl., ¶109.

Similarly, a POSITA would have understood that, as combined, an unacceptably functioning network interface indicates the potential degradation in performance of synchronous playback between Janevski’s “initiator” and “participant” “PVR” because it would result in unacceptable communication. Muchow, 4:28-36 (the “network interface allows a node 102 to send and receive messages from an external network 104”); Decl., ¶110. A POSITA would have understood Janevski’s “Internet network” is used “for communicating information between the PVRs 114a, b such that synchronization may be achieved,” and adequate network interface operation was required for proper synchronization. Janevski, 6:45-58; Decl., ¶110.

A POSITA would have been motivated to combine the Janevski-Kawamura system with Muchow to make a fault tolerant system. Decl., ¶111. Muchow teaches that “it is important to maximize the availability of critical services” which “is achieved by using a fault tolerant system,” such that when one “component fails, the fault is detected, and a redundant component takes over to correct the problem.” Muchow, 1:19-31; Decl., ¶111.

A POSITA would have recognized that Janevski’s “microprocessor 202” and Internet network interface (“received 113a”) were critical components because of

the role they play in synchronous playback and receiving audio programming, as explained above. Janevski, Abstract, 6:4-38, 6:45-58, 7:20-24, 7:57-59; Decl., ¶112.

A POSITA would have understood that fault tolerant systems were particularly advantageous in Janevski. Decl., ¶113. First, Janevski teaches “characteristic information is used to ‘fine tune’ the synchronization.” Janevski, 5:12-16, 7:41-62, 10:28-30; Decl., ¶113. The “information characteristic” is derived by “a stream characteristic unit” that is “include[d]” in the “microprocessor.” *Id.* A POSITA would have recognized these additional computational burdens increased the likelihood of overloading Janevski’s “microprocessor.” *Id.* Second, a POSITA would have known that the prevalence of high latency Internet networks at the time, like dialup Internet, elevated the importance of a fault tolerant system that could correct for spotty internet connection via the network interface. Decl., ¶113.

A POSITA would have sought solutions, as in Muchow, to monitor the performance of critical components to correct for faulty initiator PVRs. Decl., ¶114.

A POSITA would have reasonably expected success in combining the Janevski-Kawamura system with Muchow because they use similar components in similar ways. Decl., ¶115. Muchow’s “embodiments can be practiced on a general- or special purpose computer system,” and a POSITA would have understood this included Janevski’s “PVR” “processor.” Muchow, 29:45-46; Janevski, 7:22-24, 7:57-8:2; Decl., ¶115. Muchow’s embodiments also include “any type of software

program that is executed using a master-slave configuration” such as “time synchronization tasks,” like Janevski’s “synchronized PVR viewing” functions. Muchow, 4:36-43; Janevski, 6:5-7, 5:3-19; Decl., ¶115. Moreover, methods to “choose[] a new master from among the available slaves” were known. Muchow, 2:1-21; Decl., ¶115.

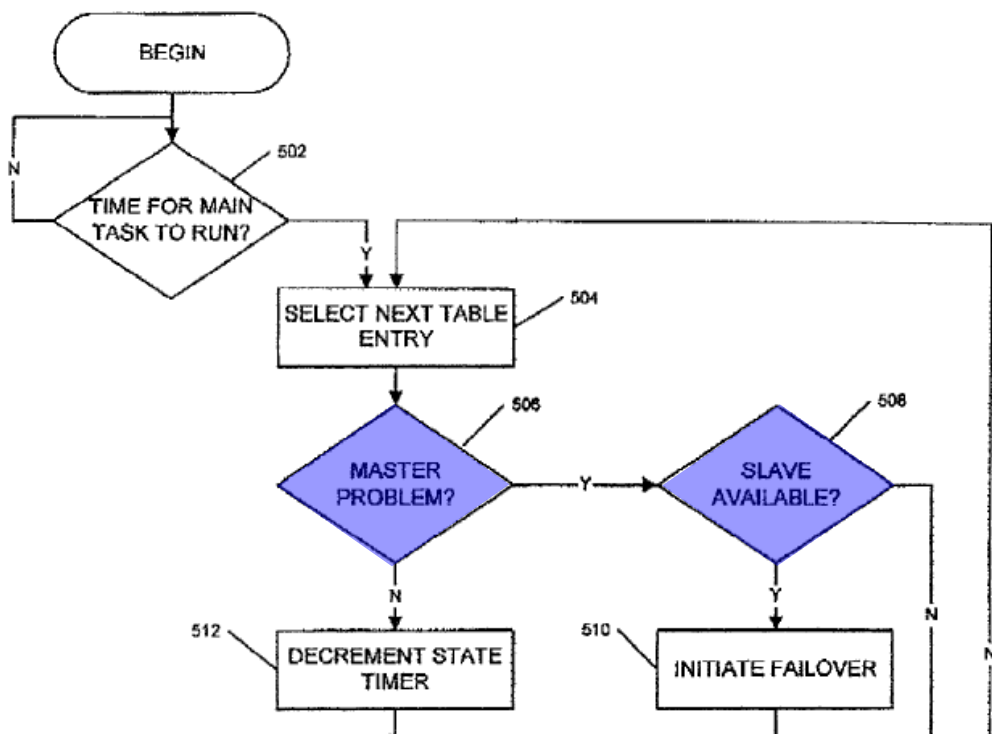
Implementing this scheme in the Janevski-Kawamura system would have used known features according to their known functions (Janevski’s PVR evaluating CPU or network interface performance (as in Muchow)) to achieve predictable results (Janevski’s initiator PVR determines an issue occurred). Decl., ¶116.

A POSITA would have reasonably expected success in combining Muchow into a system including Kawamura’s Bluetooth remote and interface because Muchow and Kawamura modify unrelated elements of Janevski. Decl., ¶117. Kawamura modifies Janevski’s remote controller and one of at least one network interfaces (*supra* Ground 1, [1aii]-[1aiii]), whereas Muchow modifies management of Janevski’s master-slave role failover (*supra* Ground 1, [1bi]; *infra* Ground 1, [1bii]-[1di]). Decl., ¶117.

- f. [1bii] “(ii) based on the evaluation, determining that the second zone player should perform the master device role for the synchrony group;”

Element [1bii] would have been obvious over the Janevski-Kawamura system in combination with Muchow’s handover process. Decl., ¶118. As discussed above,

it would have been obvious to run Muchow's monitor task on Janevski's first zone player to improve fault tolerance. *Supra* Ground 1, [1bi]; Decl., ¶118. Muchow's monitor task also discloses which slave device (second zone player in the proposed combination) should take over in response to the current master device failing the evaluation, as illustrated below. Decl., ¶118.



Muchow, FIG. 5 (excerpted).

This is further supported by the corresponding disclosure in Muchow:

- “A determination is then made, in block 506, ... whether the monitor result flag (e.g., flag 410, FIG. 4) indicates that a problem has occurred with the master.” Muchow, 14:50-60, 16:7-41; Decl., ¶119.

- “If the flag indicates that a problem has occurred, then a **determination is made, in block 508**, whether a slave is available to take over the master operations.” *Id.*
- The “monitor result flag 410 ... is used to indicate that a problem has occurred with a master ... [and is] set by the monitor task.” *Id.*

Thus, based on the monitor task’s evaluation (*supra* Ground 1, [1bi]), the “node” “determin[es] ... that a problem has occurred with the master” and that “a slave is available to take over master operations,” which discloses that based on the evaluation, determining that the second node should perform the master role. Muchow, 14:50-60, 16:7-41, 11:33-12:33; Decl., ¶119.

The determination indicates which node should become master because “[i]n one embodiment, the node fails over to the last slave that it received a Heartbeat from.” Muchow, 16:36-38; Decl., ¶120. In other embodiments, the node broadcasts a “[r]esignation message ... with an indication as to which other node should initially attempt to become master” in “an election,” which also discloses the master node determining that a specific second node should perform the master role. Muchow, 12:19-33; Decl., ¶120.

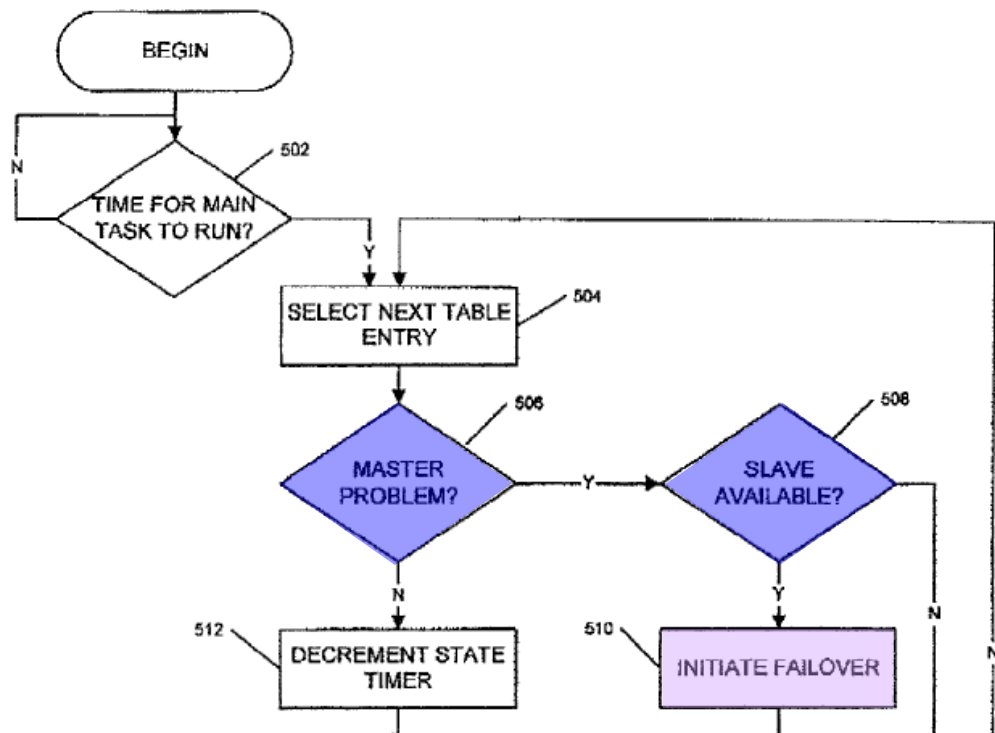
As combined, based on evaluation of the “criteria” (taught by Muchow), Janevski’s “PVR” “114a” would have determined that an “initiator” “PVR” “114a” faulted and that the “participant” “PVR” “114b” should perform the “initiator” role

for Janevski's "synchronized viewing session" (determine that the second zone player should perform the master device role). *Supra* Ground 1, [1bi]-[1bii]; Muchow, 11:33-12:33, 14:50-60, 16:7-41; Decl., ¶121.

The combination of Janevski, Kawamura, and Muchow would have been obvious, as explained for Ground 1, [1bi]. *Supra* Ground 1, [1bi]; Decl., ¶122. For the same reasons explained for [1bi], a POSITA would have been motivated to combine the Janevski-Kawamura system with Muchow's determination of a master problem and reasonably expected success in doing so. *Id.*

- a. [1c]: "in response to **determining that the second zone player should perform the master device role for the synchrony group, the first zone player initiating migration of the master device role from the first zone player to the second zone player; and**"

Element [1c] would have been obvious over the Janevski-Kawamura system in combination with Muchow's handover process. Decl., ¶123. As discussed above, as combined, Muchow's monitor task runs on Janevski's **first zone player** to improve fault tolerance. *Supra* Ground 1, [1bi]-[1bii]; Decl., ¶123. As shown below, Muchow's handover process **initiates failover (migration)** after **determining** that the **slave (second zone player)** is available to take over the **master role**. Decl., ¶123.



Muchow, FIG. 5 (excerpted). Muchow discloses that “[i]f a slave is available” (in response to determining that the second zone player should perform the master device role) “then the node initiates a failover, in block 510” (first station initiating migration of the master device role). Muchow, 3:55-60, 16:29-41, 11:33-45, 12:5-33; Decl., ¶123. Muchow’s “initiat[ing] a resignation process,” or “initiat[ing] a failover,” discloses initiating migration of the master device role because “another node will attempt to become the master.” *Id.*

This process, while including more implementation detail, is like the goals recited in Janevski. Decl., ¶124. Janevski’s “participant PVR 114b” can “assume[] the role of initiator PVR 114a,” which discloses the “PVR 114a” (first zone player) migrating the “initiator” (master) to the “PVR 114b” (second zone player). Janevski,

15:38-43; Decl., ¶124. This “role is handed off.” Janevski, 6:18-21; Decl., ¶124. As combined, it would have been obvious that a migration is initiated where the “initiator” “role is handed off” (as in Janevski) when Muchow’s “resignation process” “failover” occurs. Janevski, 15:38-43, 6:18-21; Muchow, 3:55-60, 16:29-41; Decl., ¶124.

The combination of the Janevski-Kawamura system and Muchow would have been obvious, as explained for Ground 1, [1bi]-[1bii]. *Supra* Ground 1, [1bi]-[1bii]; Decl., ¶125. For the same reasons explained for [1bi]-[1bii], a POSITA would have been motivated to combine the Janevski-Kawamura system with Muchow’s initiating migration of the master device role and reasonably expected success in doing so. *Id.*

A POSITA would also have been motivated to combine Muchow’s master role migration initiation into the Janevski-Kawamura system to complete the fault tolerant system and enable another “PVR” in Janevski’s system become the “initiator” when the current “initiator PVR” fails. Janevski, 6:18-21, 15:38-43; Decl., ¶126. As explained above, Janevski already teaches “hand[ing] off” the initiator role. *Id.* A POSITA would have further reasonably expected success because implementing this scheme in the Janevski-Kawamura system would have used known features according to their known functions (Janevski’s existing initiator/participant handoff) to achieve predictable results (Janevski’s initiator PVR

initiates the existing initiator/participant handoff after determining a fault occurred (as in Muchow)). Decl., ¶126.

- b. [1di]: “after migration of the master device role from the first zone player to the second zone player, the first zone player (i) ceasing to perform the master device role for the synchrony group, and”

Element [1di] would have been obvious over the Janevski-Kawamura system in combination with Muchow’s handover process. Decl., ¶127.

As explained for [1c], Janevski discloses that “another participant PVR 114b” can “assume[] the role of initiator PVR 114a.” *Supra* Ground 1, [1c]; Decl., ¶128. When the handoff occurs, the original “initiator PVR 114a” ceases to perform the master role because it “knows that it is no longer the initiator PVR 114a, and a participant PVR 114b ... knows that it is now the initiator PVR 114a.” Janevski, 15:43-47; Decl., ¶128.

It would have been obvious that the original “initiator PVR 114a ... knows that it is no longer the initiator PVR 114a” (as in Janevski) after the “Resignation State” “failover” migration (as in Muchow). Janevski, 15:38-47; Muchow, 16:29-41, 3:55-60, 11:33-45, 12:5-33; Decl., ¶129. Muchow’s teachings would have straightforwardly applied because after a master state hand off (*supra* Ground 1, [1c]), similarly Muchow’s “node will no longer function as the master.” Muchow,

11:60-64, 12:19-33, 11:33-35 (the “node also may transition out of the Master State 218 if the ... node is or soon will be operating improperly”); Decl., ¶129.

The combination of the Janevski-Kawamura system and Muchow would have been obvious, as explained for Ground 1, [1bi]-[1c]. *Supra* Ground 1, [1bi]-[1c]; Decl., ¶130. For the same reasons explained for [1bi]-[1c], a POSITA would have been motivated to combine the Janevski-Kawamura system with Muchow’s ceasing to perform the master device role after migration of the master device role and reasonably expected success. *Id.*

- c. [1dii] “(ii) playing back information content in synchrony with the **second zone player** while the **second zone player** is performing the **master device role** for the synchrony group.”

Janevski discloses [1dii]. Decl., ¶131. After an “initiator”/“participant” handoff (*supra* Ground 1, [1di]), the new “participant” “PVR,” which “is no longer the initiator PVR 114a,” plays back audio content in synchrony with the “**new initiator PVR 114a**” (**second zone player**) that is performing the “**initiator**” (**master**) role because “the initiator” “synchronize[s] each participant,” which now includes the former PVR 114a. Janevski, 8:45-46; 15:38-47, Abstract (“The initiator directs all participants, ... to synchronize their playbacks to that of the initiator”); *supra* Ground 1, [1ai]-[1aii] (explaining that the “initiator” “PVR” controls synchronous playback for the “participant” “PVR[s]”); Decl., ¶131.

2. Claims 7 and 13

Independent claims 7 and 13 are unpatentable for the same reasons as claim 1 because they simply repeat the elements of claim 1 and one additional unpatentable element. Decl., ¶132. The table below highlights the language in claims 7 and 13 that is copied from or substantively identical to claim 1. *Id.*

Elements of claim 1	Elements of claims 7 and 13
[1aiii]	one or more processors; at least one network interface; and
[1aii]	performing a master device role for a synchrony group comprising the first zone player and a second zone player, wherein in the master device role, the first zone player is configured to control synchronous playback of information content by both the first zone player and the second zone player in response to playback commands received from a controller device via a network interface of the first zone player;
[1bi]-[1bii]	while performing the master device role, evaluating one or more operational performance metrics of the one or more processors or the at least one network interface indicating potential degradation in performance of synchronous playback of information content by both the first and second zone player, and based on the evaluation, determining that the second zone player should perform the master device role for the synchrony group;
[1c]	in response to determining that the second zone player should perform the master device role for the synchrony group, initiating migration of the master device role from the first zone player to the second zone player; and
[1di]-[1dii]	after migration of the master device role from the first zone player to the second zone player, ceasing to perform the master device role for the synchrony group, and playing back information content in synchrony with the second zone player

	while the second zone player is performing the master device role for the synchrony group.
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Claims 7 and 13 only differ from claim 1 in their preambles and because claim 7 recites a non-transitory computer readable medium with instructions. Decl., ¶133. Claim 7’s preamble, “[a] first zone player comprising,” recites the same “zone player” of element [1ai] and is disclosed for the same reasons. *Supra* Ground 1, [1ai]; Decl., ¶133.

Claim 7 further recites “**tangible, non-transitory computer-readable media** having instructions encoded therein, wherein the instructions, when executed by the first zone player, cause the first zone player to perform functions comprising.” EX-1001, claim 7. Janevski discloses this because “**PVR 114a** includes ... a **digital memory 206**,” which is a non-transitory computer-readable media (shown in Figure 2). Janevski, 7:57-8:8; Decl., ¶134. Janevski’s memory includes instructions that are executed because “[a] memory device and a processor preferably reside in either the PVRs 114a, b” and “programming code associated with the system 110 preferably resides in the memory device and is processed by the processor.” Janevski, 7:20-24; Decl., ¶134.

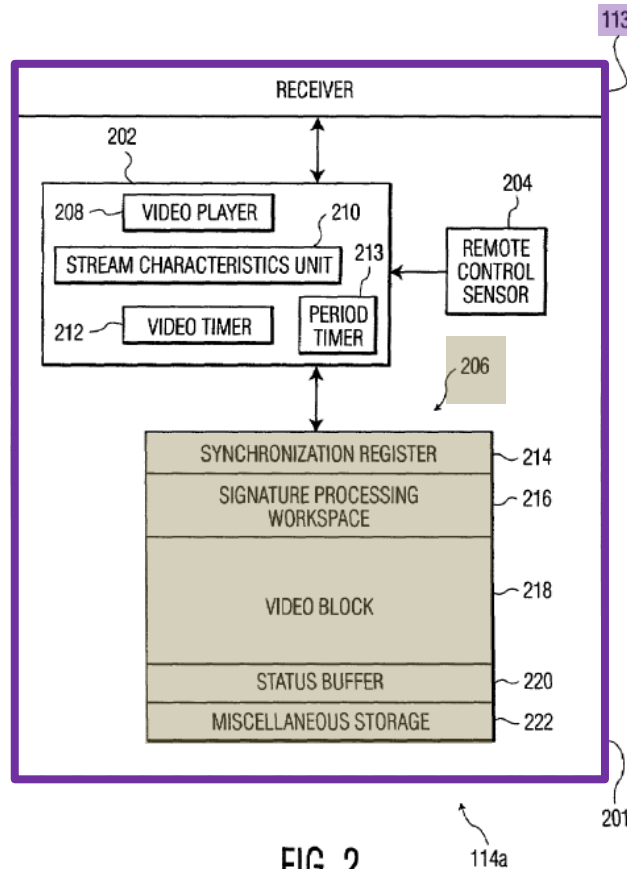


FIG. 2

Janevski, FIG. 2.

Claim 13 only differs from claim 7 because the non-transitory computer-readable media with instructions, one or more processors, and at least one network interface are recited in claim 13's preamble rather than the body. Decl., ¶135.

Claim 13's preamble is disclosed and would have been obvious as explained for claim 7 and for element [1aiii]. *Supra* Ground 1, [1aiii]; Decl., ¶135.

VII. Ground 2: Claims 1, 7, and 13 Would Have Been Obvious Over Janevski, Boyle, and Kawamura.

Patent Owner contends that the “operational performance metrics” encompass “metrics related to the wireless signal quality detected by the ... media players,” such as “the Wi-Fi signal strength of each device.” EX-1012 at 3; Decl., ¶136. Under Patent Owner’s apparent interpretation, claims 1, 7, and 13 would have been obvious over Janevski, Boyle, and Kawamura. *Id.*

A. Boyle

Boyle discloses “determining the rank of all the stations in the network and master transfer means for enabling the station having the highest rank to take the role of master in the network.” Boyle, [0005]. Boyle “is applicable to any [] communication system in which stations are able to form an ad-hoc network.” *Id.*, [0001].

Boyle discloses “stations” including “**master A** and three **slaves A1, A2, A3.**” *Id.*, [0014].

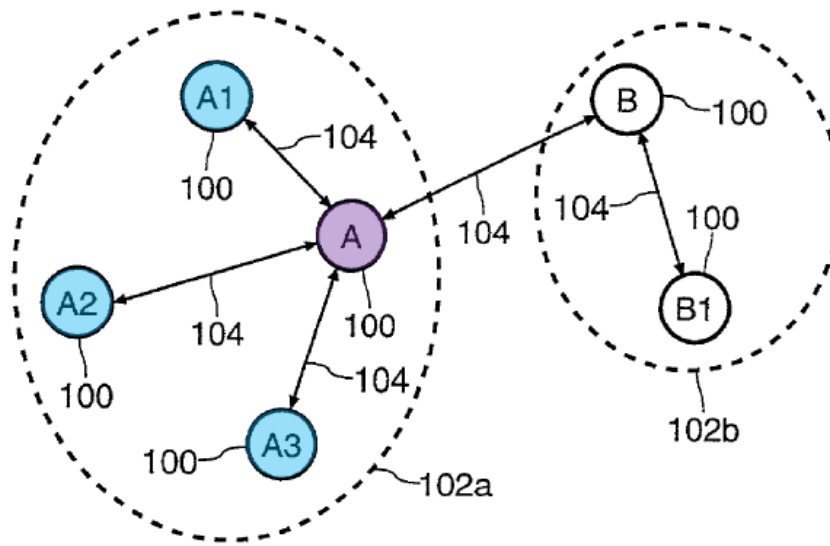


FIG. 1

Id., FIG. 1.

The “master station [] request[s] each of the other stations 100 to provide their rankings.” *Id.*, [0024]. “If the master station determines that its ranking is lower than one of its slave stations then it hands over the master role to that station.” *Id.*

Boyle is in the same technical field as the ’715 patent because it is reasonably pertinent to the problem faced by the inventor: detecting failovers and migrating the master role. *Compare* EX-1001, 8:41-9:4, 10:60-11:4, 13:22-36, 16:3-26, with Boyle, Abstract, [0005]-[0007], [0023]-[0024], [0028]; Decl., ¶140. *In re ICON*, 496 F.3d at 1379-80.

B. Independent Claims

Boyle plays the same role as Muchow in Ground 1’s combination. *Supra* Ground 1, [1bi]-[1di]; Boyle, [0024]; Decl., ¶141. Under Patent Owner’s apparent

interpretation of the claims, claim 1 would have been obvious over the combination of Janevski, Boyle, and Kawamura. Decl., ¶141.

1. Claim 1

a. [1preamble] through [1aiii] and [1dii]

Janevski discloses elements [1preamble], [1ai], and [1dii], and elements [1aii] and [1aiii] would have been obvious over the Janevski-Kawamura system, for the reasons explained in Ground 1. *Supra* Ground 1, [1preamble]-[1aiii], [1dii]; Decl., ¶142.

b. [1bi]: “while performing the **master device role, the **first zone player** (i) **evaluating one or more operational performance metrics** of the one or more processors or the at least one network interface **indicating potential degradation in performance of synchronous playback of information content** by both the **first** and **second zone player**, and”**

Element [1bi] would have been obvious over the Janevski-Kawamura system in combination with Boyle. Decl., ¶143. Boyle discloses a “**master station**” (device in a **master role**) receives “rankings” from “**slave stations**” (device in a **slave device role**) and, under Patent Owner’s apparent interpretation of the claim, “**compare[s]**” “rankings” (**evaluating operational performance metrics**). Boyle, [0007], [0023]-[0024], [0028]; Decl., ¶143.

Boyle discloses “stations,” such as “master A and three slaves A1, A2, A3” illustrated below. Boyle, [0014]; Decl., ¶144. Boyle’s “master station” discloses a device “performing the role of master.” Boyle, [0003], [0005]; Decl., ¶144.

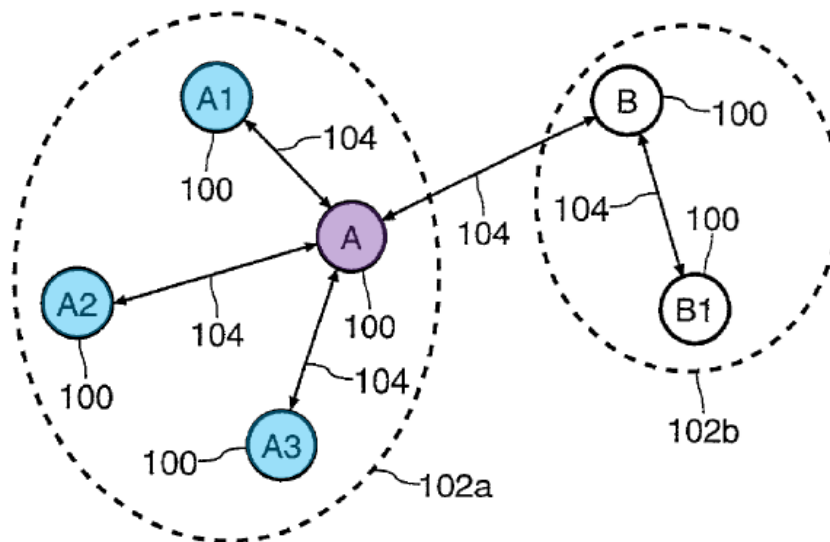


FIG. 1

Boyle, FIG. 1.

Boyle’s “master station [] request[s] each of the other stations 100 to provide their rankings.” Boyle, [0007], [0024], [0028]; Decl., ¶145. The “master station” evaluates these “rankings” because it “compare[s]” them. *Id.* For example, “the master station could compare its ranking with that of the slave station.” *Id.*

Under Patent Owner’s apparent interpretation of the claim, Boyle’s “rankings” disclose operational performance metrics because they are “antenna rankings,” “for example based on measured VSWR or some other signal quality

measure.” Boyle, [0023]; Decl., ¶146. The ranking or quality of an “antenna” or “signal” at least describes operational performance metrics of Boyle’s “antenna” (network interface), which is “for transmitting and receiving radio signals.” Boyle, [0015], [0023]; Decl., ¶146. This is consistent with Patent Owner’s infringement contentions. EX-1012 at 3 (contending that the “operational performance metrics” encompass “metrics related to the wireless signal quality detected by the ... media players,” such as “the Wi-Fi signal strength of each device”); Decl., ¶146.

Boyle’s “antenna rankings” indicate potential degradation in performance of synchronous playback of information content by both devices because the “the role of master” is “taken by the station having the highest rank.” Boyle, [0007], [0023]; EX-1012 at 3; Decl., ¶147. If the master station’s ranking drops below that of a slave station, that would indicate the current station is not the “optimum master station,” and therefore “signal quality” is below the optimum level. *Id.* Boyle’s invention operates “to *improve* the operational efficiency of an ad-hoc wireless network.” Boyle, [0004]; Decl., ¶147. This is consistent with Patent Owner’s infringement contentions. EX-1012 at 3; Decl., ¶147.

As combined, Janevski’s “initiator” “PVR 114a” would have implemented Boyle’s “compar[ison]” of “antenna rankings” to identify whether an “initiator” “PVR” “114a” is appropriate to perform the “initiator” master role (evaluating one

or more operational performance metrics). Boyle, [0007], [0023]-[0024], [0028]; Janevski, 6:16-21; Decl., ¶148.

A POSITA would have been motivated to combine the Janevski-Kawamura system with Boyle's operational performance evaluation, and reasonably expected success in doing so, for the same reasons explained in Ground 1, [1bi]. *Supra* Ground 1, [1bi]; Decl., ¶149. A POSITA would have recognized that Boyle's solution "improv[es] the efficiency of communication in the network" and been further motivated to combine the Janevski-Kawamura system with Boyle to improve the network communication efficiency between Janevski's PVRs. Boyle, Abstract, [0004]; Decl., ¶149.

A POSITA would have reasonably expected success in combining the Janevski-Kawamura system with Boyle because they use similar components in similar ways. Decl., ¶150. Boyle is "applicable to any [] communication system in which stations are able to form an ad-hoc network," such as Janevski's "synchronized viewing session" which "new participant PVR 114b[s]" can join ad hoc. Boyle, [0001]; Janevski, 7:30-31 ("During the session, viewers may drop out or be added to the session" ad hoc), 11:4-14; Decl., ¶150. Even though Boyle's exemplary embodiments are described as wireless communication systems, Janevski teaches interconnecting PVRs via the Internet and it would have been well known to use wireless 802.11 connectivity in internetworked systems. Janevski, 6:45-58,

6:6-11; Goldberg, 79:24-33 (explaining “normal Internet connections” include using a “wireless ... 802.11 access point” which connects to an “Internet cloud”); Decl., ¶150. Moreover, Boyle’s “stations” include “wireless headsets” and “home entertainment equipment,” which are audio playback devices analogous to Janevski’s PVRs. Boyle, [0013], [0026]-[0027]; Janevski, 6:4-38; Decl., ¶150.

Implementing Boyle’s method in the Janevski-Kawamura system would have used known features according to their known functions (Janevski’s PVR evaluating network interface performance (as in Boyle)) to achieve predictable results (Janevski’s initiator PVR determines another PVR has better network interface performance). Decl., ¶151.

A POSITA would have reasonably expected success in combining Boyle into a system including Kawamura’s Bluetooth remote and interface because Boyle and Kawamura modify unrelated elements of Janevski. Decl., ¶152. Boyle modifies management of Janevski’s master-slave role failover, different than Kawamura. *Supra* Ground 1, [1aii]-[1aiii], Ground 2, [1aii]-[1bi]; *infra* Ground 2, [1bii]-[1di]). Decl., ¶152.

- c. [1bii] “(ii) based on the evaluation, determining that the second zone player should perform the master device role for the synchrony group;”

Element [1bii] would have been obvious over the Janevski-Kawamura system in combination with Boyle. Decl., ¶153.

Boyle discloses the “master station” (device in master role), based on evaluating the “rankings” (evaluating operational performance metrics), and “determines that its ranking is lower than one of its slave stations” (determining that the second device should perform the master device role). Boyle, [0023]-[0024]; Decl., ¶154.

Boyle discloses that based on this “compar[ison],” “[i]f the master station determines that its ranking is lower than one of its slave stations then it hands over the master role to that station,” which discloses determining that the second device should perform the master device role. Boyle, [0024], [0028]; Decl., ¶155. Boyle also explains “the master station could compare its ranking with that of the slave station ... and hand over the master function if required.” *Id.*

As combined, based on “compar[ison]” of the “rankings” (as in Boyle), Janevski’s “PVR” “114a” would have determined that the “participant” “PVR” “114b” has a higher “antenna ranking” than the original “initiator” “PVR” “114a” such that it should perform the “initiator” role for Janevski’s “synchronized viewing session” (determine that the second zone player should perform the master device role for the synchrony group). *Supra* Ground 2, [1bi]-[1bii]; Boyle, [0007], [0023]-[0024], [0028]; Decl., ¶156.

The combination of the Janevski-Kawamura system and Boyle would have been obvious, as explained for Ground 2, [1bi]. *Supra* Ground 2, [1bi]; Decl., ¶157.

For the same reasons explained for [1bi], a POSITA would have been motivated to combine the Janevski-Kawamura system with Boyle's determination that the slave's antenna ranking is higher than the master's and reasonably expected success in doing so. *Id.*

- d. [1c]: “in response to determining that the second zone player should perform the master device role for the synchrony group, the first zone player initiating migration of the master device role from the first zone player to the second zone player; and”

Element [1c] would have been obvious over the Janevski-Kawamura system in combination with Boyle. Decl., ¶158.

Boyle discloses “[i]f the master station determines that its ranking is lower than one of its slave stations then it hands over the master role to that station.” Boyle, [0024]; Decl., ¶159. Therefore, in response to determining that a specific slave station has a higher ranking, Boyle discloses “hand[ing] over,” or initiating migration of, “the master role to that station.” *Id.*

As explained for Ground 1, [1c], Janevski discloses that “another participant PVR 114b” can “assume[] the role of initiator PVR 114a,” which discloses the “PVR 114a” (first zone player) migrating the “initiator” (master) to the “PVR 114b” (second zone player). *Supra* Ground 1, [1c]; Janevski, 15:38-47; Decl., ¶160. As combined, it would have been obvious that a migration is initiated where the

“initiator” “role is handed off” (as in Janevski) when Boyle’s “hand[] over” occurs. Janevski, 15:38-43, 6:18-21; Boyle, [0024]; Decl., ¶160.

The combination of the Janevski-Kawamura system and Boyle would have been obvious, as explained for Ground 2, [1bi]-[1bii]. *Supra* Ground 2, [1bi]-[1bii]; Decl., ¶161. For the same reasons explained for [1bi]-[1bii], a POSITA would have been motivated to combine the Janevski-Kawamura system with Boyle’s initiating migration of the master device role and reasonably expected success in doing so. *Id.*

Moreover, a POSITA would have been motivated to combine Boyle’s master role migration initiation into the Janevski-Kawamura system to complete the fault tolerant system and enable another “PVR” in Janevski’s system become the “initiator” when the current “initiator PVR” fails, and reasonably expected success in doing so, as explained for Ground 1, [1c]. *Supra* Ground 1, [1c]; Decl., ¶162.

- e. [1di]: “after migration of the master device role from the first zone player to the second zone player, the first zone player (i) ceasing to perform the master device role for the synchrony group, and”

Element [1di] would have been obvious over the Janevski-Kawamura system in view of Boyle. Decl., ¶163.

As explained for Ground 1, [1di], after handoff, Janevski’s “PVR” ceases to perform the “initiator” role because it “knows that it is no longer the initiator PVR 114a.” *Supra* Ground 1, [1di]; Janevski, 15:38-47; Decl., ¶164.

It would have been obvious that the original “initiator PVR 114a ... knows that it is no longer the initiator PVR 114a” (as in Janevski) after “transferring the role of master to a second station” (as in Boyle). Janevski, 15:38-47; Boyle, [0006], [0024]; Decl., ¶165. Boyle’s teachings would have straightforwardly applied because after a master role hand off (*supra* Ground 2, [1c]), Boyle’s station similarly ceases to perform the master role because only “the station (100) having the highest rank in a network (102a, 102b) performs the role of master.” Boyle, Abstract; Decl., ¶165.

The combination of the Janevski-Kawamura system and Boyle would have been obvious, as explained for Ground 2, [1bi]-[1c]. *Supra* Ground 2, [1bi]-[1c]; Decl., ¶166. For the same reasons explained for [1bi]-[1c], a POSITA would have been motivated to combine the Janevski-Kawamura system with Boyle’s ceasing to perform the master device role after migration of the master device role and reasonably expected success in doing so. *Id.*

2. Claims 7 and 13

Independent claims 7 and 13 are unpatentable for the same reasons as claim 1 because they simply repeat a subset of the elements of claim 1 and one additional unpatentable element, as explained for Ground 1. *Supra* Ground 1, claims 7 and 13; Decl., ¶167.

VIII. Ground 3: Claims 2, 8, and 14 Would Have Been Obvious Over Janevski in View of Muchow, Kawamura, and Raman.

Raman discloses evaluating processor overload, and it would have been obvious to include in the Janevski-Kawamura-Muchow system. Decl., ¶168.

A. Raman

Raman relates to “failover manager[s]” in the context of “audio or video data.” Raman, 3:17-47. Raman discloses “detecting ... the failure or incapacity of the first stream server to effectively serve the stream data” and migrating to a second stream server. *Id.* One failover occurs when “processing burdens ... overload the first stream server.” *Id.*, 17:65-18:1.

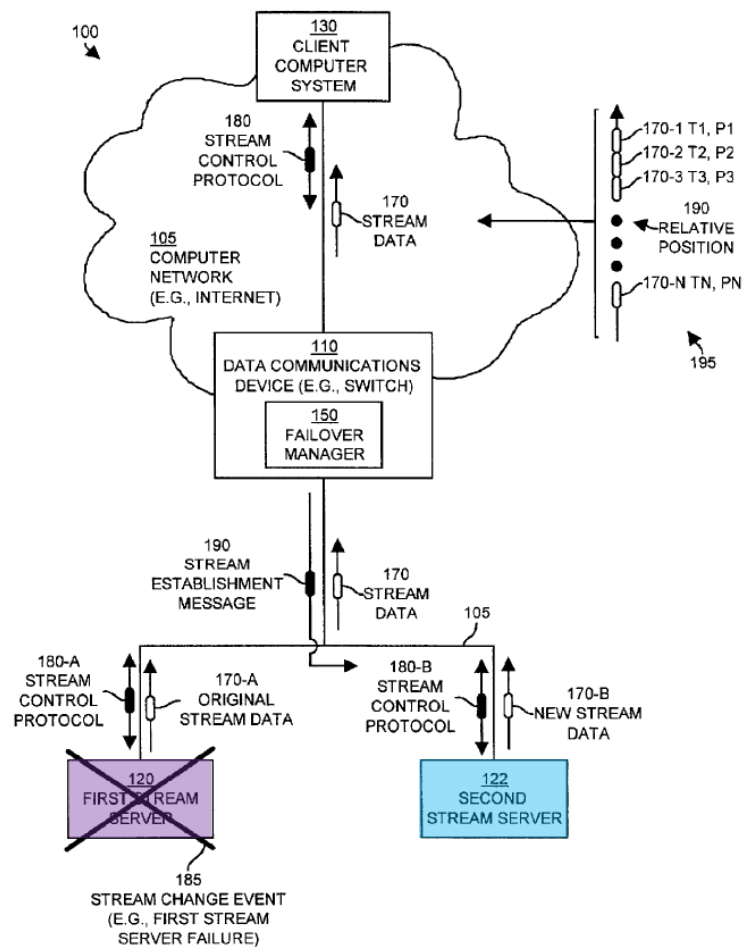


FIG. 1

Raman, FIG. 1, 8:52-55, 9:35-50.

Raman is in the same technical field as the '715 patent because it is reasonably pertinent to the problem faced by the inventor: detecting failovers in operational performance and migrating devices. Compare EX-1001, 8:41-9:4, 10:60-11:4, 13:22-36, 16:3-26, with Raman, 3:17-47; Decl., ¶170; *In re ICON*, 496 F.3d at 1379-80.

B. Dependent Claims

- 1. Claims 2, 8, and 14: “wherein while performing the master device role, evaluating one or more operational performance metrics of the one or more processors or the at least one network interface indicating potential degradation in performance of synchronous playback of information content by both the first and second zone player comprises the first zone player determining that at least one of the one or more processors of the first zone player is overloaded.”**

Claims 2, 8, and 14 would have been obvious over the Janevski-Muchow-Kawamura system in view of Raman. Decl., ¶171. Raman discloses “detect[ing] an overload” (determining a processor is overloaded) of a “first stream server” and migrating to a “second stream server.” Raman, 3:28-32, 12:2-12; Decl., ¶171.

Raman discloses a “failover manager” that “may detect an overload.” Raman, 11:63-66, 17:63-65; Decl., ¶172. “[T]he failover manager 150 includes an event detector 156” which “detect[s] that the first stream server 120 indicates an overload for serving stream data.” Raman, 14:1-17, 17:65-18:1; Decl., ¶172. For example, the “processing burdens required to serve such streams may overload the first stream server.” Raman, 17:65-18:1; Decl., ¶172. Raman’s “indicat[ing] an overload” caused by “processing burdens” discloses determining a processor is overloaded because “processing burdens” are the burdens on a processor. *Id.*

As combined, Janevski's "initiator" "PVR" would have evaluated operational performance metrics (as in Muchow), including whether the processing burdens are too high (as in Raman) for the current "initiator" "PVR" processor. Decl., ¶173.

A POSITA would have realized the advantage of ensuring the "processing burdens" were manageable for the initiator (master) PVR in Janevski to avoid failure, as in Raman. Raman, 17:65-18:1; Janevski, 7:36-41; Decl., ¶174. A POSITA would have been motivated to combine the Janevski-Kawamura-Muchow system with Raman to improve on Muchow's techniques by evaluating additional important operational criteria of the processor, including Raman's "processing burdens" indicating "overload." *Id.* When addressing the problem of processor failovers, a POSITA logically would have sought references describing commonplace processor failovers in streaming systems, such as Raman describes overloaded processing burdens.⁴ Decl., ¶174; *In re ICON*, 496 F.3d at 1379-80.

A POSITA would have reasonably expected success in implementing Raman's measurement of "processing burdens" in the Janevski-Kawamura-Muchow system because it requires no more than the straightforward application of Muchow's teachings, which already evaluate criteria, to evaluate an additional

⁴ Sonos admitted Janevski is "similar" to other references "configured to receive and render video content broadcasts" EX-1020 at 70.

criterion. *Supra* Grounds 1/2 [1bi]-[1c]; Raman, 17:65-18:1; Decl., ¶175. Implementing this scheme in the Janevski-Kawamura-Muchow system would have used known features according to their known functions (Muchow’s techniques for assessing operational performance metrics and Raman’s “processing burdens” criteria), to achieve predictable results (Janevski’s initiator PVR compares Raman’s “processing burdens” like Muchow’s existing assessments). Decl., ¶175.

A POSITA would have reasonably expected success in combining Raman into a system including Kawamura’s Bluetooth remote and interface because Raman and Kawamura modify unrelated elements of Janevski. Decl., ¶176. Raman provides evaluating a specific operational performance criterion, different than Kawamura. *Supra* Grounds 1/2, [1aii]-[1aiii]; Decl., ¶176.

IX. Grounds 4A/4B: Claims 3, 9, and 15 Would Have Been Obvious Over Janevski in View of Muchow, Kawamura, and Roy and Over Janevski in View of Boyle, Kawamura, and Roy.

Roy discloses a network latency metric, and it would have been obvious to include in the Janevski-Kawamura-Muchow and Janevski-Kawamura-Boyle systems. Decl., ¶177.

A. Roy

Roy “pertains to ... reducing latency when synchronizing access to a multi-user database over a network.” Roy, 1:5-9. Roy’s system includes “first” and “second event server[s].” *Id.*, 2:2-10. Roy discloses, “based on a network latency

criterion,” “changing the status of the first event server from master event server to slave ... and assigning the status of master event server to the second event server.”

Id.

Roy is in the same technical field as the '715 patent because it is reasonably pertinent to the problem faced by the inventor: reducing network latency by migrating the status of master and slave devices. *Compare* EX-1001, 10:66-11:4, claims 3, 9, 15, *with* Roy, 1:5-26, 1:46-2:10; Decl., ¶179; *In re ICON*, 496 F.3d at 1379-80.

B. Dependent Claims

- 1. Claims 3, 9, and 15: “wherein the one or more operational performance metrics comprise a network latency metric, and wherein while performing the master device role, the first zone player evaluating one or more operational performance metrics of the one or more processors or the at least one network interface indicating potential degradation in performance of synchronous playback of information content by both the first and second zone player comprises the first zone player determining that migrating the master device role from the first zone player to the second zone player would improve latency of message transmission within the synchrony group.”**

Claims 3, 9, and 15 would have been obvious over the Janevski-Muchow-Kawamura and Janevski-Boyle-Kawamura systems in view of Roy. Decl., ¶180. Roy discloses a “network latency criterion.” Roy, 2:2-10; Decl., ¶180. This discloses a network latency metric because the criterion indicates tolerable latency within the

network. *Id.* For example, Roy’s “master event server” can determine whether a slaves “role requires the lowest latency,” and thus “relinquish its status as master” to minimize latency. Roy, 7:26-42, 8:41-51; Decl., ¶180. The “latency” is of message transmission, as claimed, because Roy’s invention is in the context of “latency in communicating data between computers.” Roy, 1:23-26; Decl., ¶180.

Roy further discloses “changing the status of the first event server from master event server to slave event server based on a network latency criterion and assigning the status of master event server to the second event server based on the network latency criterion.” Roy, 2:5-10; Decl., ¶181. This migration improves latency because “the master event server and the master database are migrated to another machine in order to *minimize latency*.” Roy, 7:26-30; Decl., ¶181. For example, Roy teaches “determin[ing]” “which computer system participating in the game ... ha[s] the role which requires the *least latency*,” and “the master event server 66 is migrated” so the master is the device with the lowest latency, thus improving latency. Roy, 5:65-6:2; Decl., ¶181.

A POSITA would have been motivated to combine the Janevski-Kawamura-Boyle and Janevski-Kawamura-Muchow systems with Roy to “minimize latency” by evaluating a “network latency criterion” and migrating the initiator role to the PVR having the “least latency,” as in Roy. Roy, 2:5-10, 5:65-6:2, 7:26-30; Janevski,

6:4-38, 15:32-47; Decl., ¶182. This would have advantageously improved user experience by reducing communications delays. *Id.*

Roy teaches a “problem” exists because systems “designed for multiple players using different computers tend to be sensitive to latency in communicating data between computers.” Roy, 1:19-26; Decl., ¶183. A POSITA would have understood this problem applied to Janevski where multiple PVRs communicate data and playback audio and video in synchrony, as explained in Ground 1, [1aii]. *Supra* Ground 1, [1aii]; Decl., ¶183. A POSITA would have known that latency was a well-known problem in data communications and sought to address it. Decl., ¶183.

A POSITA would have recognized the importance of monitoring latency because Janevski’s initiator PVR controls synchronous playback by transmitting timing information (*supra* Ground 1, [1aii]; *infra* Ground 5A/5B, [5c]). Decl., ¶184. Ensuring tolerable network latency would have advantageously ensured the timing information is not out of date when it reaches the participant PVRs. Decl., ¶184. When addressing the problem of network interface performance, a POSITA logically would have sought references describing commonplace network interface

failures, such as Roy’s network latency criterion.⁵ Decl., ¶184; *In re ICON*, 496 F.3d at 1379-80.

A POSITA would have reasonably expected success in implementing Roy’s “network latency criterion” in the Janevski-Kawamura-Muchow and Janevski-Kawamura-Boyle systems because it requires no more than the straightforward application of Muchow’s and Boyle’s teachings, which already teach evaluating criteria, to evaluate an additional criterion. *Supra* Grounds 1/2, [1bi]-[1c]; Roy, 2:5-10; Decl., ¶185. Implementing this scheme would have used known features according to their known functions (Muchow’s or Boyle’s techniques for assessing operational performance metrics evaluating Roy’s additional criterion), to achieve predictable results (Janevski’s initiator PVR evaluates which PVR has the lowest network latency). Decl., ¶185.

A POSITA would have reasonably expected success in combining Roy into a system including Kawamura’s Bluetooth remote and interface because Roy and Kawamura modify unrelated elements of Janevski. Decl., ¶186. Roy provides evaluating a specific operational performance criterion, different than Kawamura. *Supra* Grounds 1/2, [1aii]-[1aiii]; Decl., ¶186.

⁵ Sonos admitted Janevski is “similar” to other references “configured to receive and render video content broadcasts ...” EX-1020 at 70.

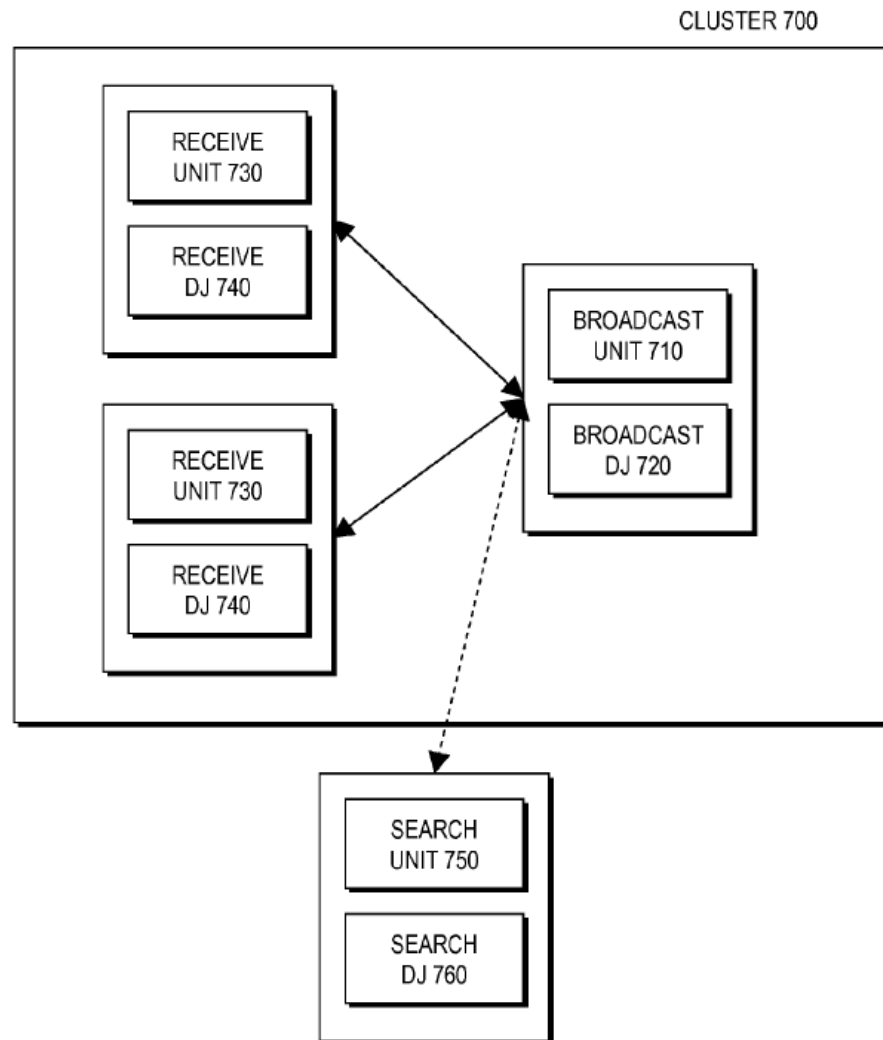
X. Grounds 5A/5B: Claims 5, 11, and 17 Would Have Been Obvious Over Janevski in View of Muchow, Kawamura, and Goldberg and Over Janevski in View of Boyle, Kawamura, and Goldberg.

Janevski discloses audio and timing information. Goldberg discloses a network address and audio information, and it would have been obvious to include these in Janevski-Kawamura-Muchow and Janevski-Kawamura-Boyle systems. Decl., ¶187.

A. Goldberg

Goldberg “relates to localized wireless audio networks for shared listening of recorded music.” Goldberg, 1:10-13, 6:14-23. Goldberg’s system includes a “broadcast unit,” “receive units,” and “search units.” *Id.*, 30:15-20, 36:18-26. “[T]he audio playback on the broadcast unit 710 and the receive units 730 [is] highly synchronized.” *Id.*

Fig. 6



Goldberg, FIG. 6.

To ensure that all devices have audio for playback, Goldberg discloses that “[i]f the music file is not present [at a unit], then transfer of the music file from the broadcast unit to the receive units can automatically proceed through a file transfer mechanism.” *Id.*, 39:30-32. And to establish multicast, “the broadcast unit 710 can

then provide ... to the search unit ... a private IP address for multicasting.” *Id.*, 56:15-33.

Like the ’715 patent, Goldberg is in the technical field of controlling synchronous audio playback. *Compare* EX-1001, 1:25-45, 2:35-48, 5:33-39, *with* Goldberg, 6:14-23, 36:17-40:16, 40:33-41:28; Decl., ¶190.

B. Dependent Claims

1. Claims 5, 11, and 17:

- a. [5a], [11a], and [17a]: “wherein the first zone player performing the master device role for the synchrony group comprises the first zone player transmitting to at least the second zone player: (i) a network address that the first zone player uses to transmit audio information,”**

Elements [5a], [11a], and [17a] would have been obvious over the Janevski-Muchow-Kawamura and Janevski-Boyle-Kawamura systems in view of Goldberg. Decl., ¶191. Goldberg discloses a “broadcast unit” (first zone player) “provide[s] a private IP address for multicasting” (transmitting network address) to a “search unit” (second zone player). Goldberg, 56:15-33, 58:3-6; Decl., ¶191. Goldberg’s units are “audio devices.” Goldberg, 29:14-21, 76:27-77:9; Decl., ¶191. The “broadcast unit” “provid[ing]” an “IP address for multicasting” to another “unit” discloses a first zone player transmitting a network address to a second zone player. Goldberg, 56:15-33, 58:3-6; Decl., ¶191. The “IP address” is a network address because it is an address in an Internet network. *Id.* The “IP address” is the address the “broadcast unit” uses

to transmit audio information because the “multicasting” is for “audio multicasting,” which is audio information transmission. *Id.*

As combined, Janevski’s “PVR” “114a” would have transmitted Goldberg’s “IP address for multicasting” to Janevski’s “PVR” “114b” for multicasting. Janevski, 6:45-51; Goldberg, 56:15-33, 58:3-6; Decl., ¶192.

A POSITA would have recognized that Janevski’s initiator PVR communicates data (e.g., status messages) to a group of participant PVRs when “[m]ore than two users [] participate in a synchronized viewing session.” *Supra* Grounds 1/2, [1ai]-[1aii]; *infra* Grounds 5A/5B, [5b]-[5c], Grounds 6A/6B, [6a]; Janevski, 6:45-51, 7:25-30; Decl., ¶193. When Janevski’s user executes a “control function,” that user’s PVR (which can be the initiator PVR, *supra* Ground 1, [1aii]) “broadcasts a command” to “the PVR 114b of each participant, to keep the presentation synchronized.” Janevski, 7:31-36, 7:47-50 (using “message recipients’ PVR 114b” plural confirms each participant PVR receives the status message); Decl., ¶193. A POSITA would have been motivated to combine advantageous solutions for communicating data to groups of devices into the Janevski-Kawamura-Muchow and Janevski-Kawamura-Boyle systems, as in Goldberg. Goldberg, 56:15-33, 82:8-16; Decl., ¶193. A POSITA would have understood that Janevski’s “broadcast[]” at least suggests a multicast. Janevski, 7:31-36; Decl., ¶193.

A POSITA would have known that “multicast service offers significant advantages,” especially for data communication to Janevski’s collective group. Decl., ¶194. The prior art explains that “[t]he most obvious advantage is seen from the perspective of bandwidth usage,” and “[a]nother advantage of multicast is the group abstraction ... [that] often simplifies the design and implementation of distributed systems.” Grossglauser, 6:13-32; Decl., ¶194.

A POSITA would have reasonably expected success in combining the Janevski-Kawamura-Muchow and Janevski-Kawamura-Boyle systems with Goldberg because they implement similar components to achieve similar goals. Decl., ¶195. Janevski and Goldberg both teach transmitting information between two audio devices to enable synchronous playback. *Supra* Grounds 1/2, [1aii], *infra* Grounds 5A/5B, [5b]-[5c]; Goldberg, Abstract, 39:30-40:10; Decl., ¶195. Moreover, multicasting was known. Decl., ¶195; Grossglauser, 6:13-32; Champagne, 1:15-2:40; Grundstrom, 1:5-2:35 (explaining “multicast networks” and “multicast IP address[es]” where known).

Like Janevski and Goldberg, Muchow involves “computer system[s]” where nodes transmit data amongst each other (e.g., “send and receive messages from an external network”). Muchow, 4:28-43, 29:45-46; Decl., ¶196. Also like Janevski and Goldberg, Boyle implements audio devices (“wireless headsets” and “home

entertainment equipment”) which transmit data amongst each other (e.g., the master “transmits” a “paging message”). Boyle, [0001], [0013], [0026]-[0028]; Decl., ¶196.

Implementing Goldberg’s IP address transmission would have used known features according to their known functions (Janevski’s existing network and known multicast IP addresses), to achieve predictable results (Janevski’s PVR 114b transmits an IP address to PVR 114b, as in Goldberg). Decl., ¶197.

A POSITA would have reasonably expected success in combining Goldberg into a system including Kawamura’s Bluetooth remote and interface and Muchow’s/Boyle’s management of Janevski’s master-slave role failover because Goldberg, Kawamura, Muchow, and Boyle modify unrelated elements of Janevski. Decl., ¶198. Goldberg modifies the data communicated between Janevski’s PVRs, different than Kawamura, Muchow, or Boyle. *Supra* Grounds 1/2, [1aii]-[1di]). Decl., ¶198.

b. [5b], [11b], and [17b]: “(ii) audio information, and”

Janevski discloses [5b], [11b] and [17b]. Decl., ¶199. These elements also would have been obvious over the Janevski-Muchow-Kawamura and Janevski-Boyle-Kawamura systems in view of Goldberg. *Id.*

As explained for [1aii], Janevski discloses “a status message is sent out periodically by the ‘initiator’, i.e., the PVR 114a that initiated the session” (first playback device performing the master device role). Janevski, 7:36-50; *supra*

Ground 1, [1aii]; Decl., ¶200. This “status message” is received by “message recipients’ PVR 114b” (second playback device). *Id.*

Janevski’s “status message includes ... information characteristic of content of a digital bit stream,” which discloses audio information. Janevski, 7:41-50; Decl., ¶201. For example, Janevski discloses comparing “corresponding content or ‘landmarks’ of pairs of video playbacks to be synchronized.” Janevski, 3:52-57; Decl., ¶201. This “characteristic information may be characteristic of ... audible sounds” and “audio transform coefficients” “can be used to characterize the content of the bit streams.” Janevski, 16:38-43; Decl., ¶201.

A POSITA would have understood that “audio transform coefficients” are computed from frames of audio samples and are part of the compressed audio stream. *Id.* The prior art explains that an “audio signal” is “transformed from the time domain ... to another domain that facilitates analysis” and “[t]he transformation produces a set of amplitude coefficients of a variable other than time, typically frequency.” Lim, 2:11-16, 2:45-47; Decl., ¶202. Therefore, audio transform coefficients are audio information. *Id.* This is consistent with the ’715 patent specification which explains that audio information can be less than the full content for playback because, for example, “each frame compris[es] digital audio information for a predetermined period of time.” EX-1001, 19:49-53; Decl., ¶202.

To the extent audio information means the full content for playback, it would have been obvious to modify Janevski's "initiator" "PVR" "114a" to transmit the "broadcast" to the "participant" "PVR" "114b" if it did not already have the broadcast recorded. Janevski, 6:13-38, 6:45-51, 6:59-7:3; Decl., ¶203.

Goldberg discloses that "[i]f the music file is not present, then transfer of the music file from the broadcast unit to the receive units can automatically proceed through a file transfer mechanism such as peer-to-peer transfer." Goldberg, 39:30-40:2; Decl., ¶204. Goldberg's "music file" discloses audio information. *Id.*

As combined, Janevski's "initiator" "PVR" "114a" would have transmitted Goldberg's "music file" to the "participant" "PVR" "114b" if it did not already have the broadcast program downloaded. Janevski, 6:45-7:3; Goldberg, 39:30-40:2; Decl., ¶205.

It would have been obvious to combine the Janevski-Kawamura-Muchow and Janevski-Kawamura-Boyle systems with Goldberg, as established for Ground 5A/5B, [5a]. *Supra* Ground 5A/5B, [5a]; Decl., ¶206. A POSITA would have been motivated to implement Goldberg's audio file transfer to advantageously allow two PVRs to synchronously playback programming that one of the PVRs did not previously record. Decl., ¶206; Goldberg, 39:30-40:2. A POSITA would have recognized that Janevski expressly teaches that "[a]lthough [] copies of video 308 are described as recorded from broadcasts, this is not a limitation," and "[t]he video

copies could be downloaded from a service provider.” Janevski, 16:10-16; Decl., ¶206. Moreover, Janevski teaches that “[t]he video copies whose playback is being synchronized need not be remotely located, nor locally located at their respective PVRs.” *Id.* A POSITA would have sought solutions for retrieving audio copies where the second PVR had not previously recorded a copy. *Id.* Goldberg teaches such a solution by allowing one of Janevski’s second PVR to download the content from the first PVR. *Id.*

A POSITA would have reasonably expected success in combining the Janevski-Kawamura-Muchow and Janevski-Kawamura-Boyle systems with Goldberg because they disclose similar systems, as explained for Grounds 5A/5B, [5a]. *Supra* Grounds 5A/5B, [5a]; Decl., ¶207. The expectation of success would have been heightened because Janevski already teaches that “copies could be downloaded from a service provider” and “need not be ... locally located at their respective PVRs,” thus contemplating a variety of sources. Janevski, 16:10-16; Decl., ¶207. Janevski and Goldberg also both apply to transmitting video and/or audio information. *Compare* Janevski, 5:9-12, 16:33-43 (“presentation may be merely visual or merely aural or both visual and aural”) *with* Goldberg, 76:10-25(Goldberg’s units can “comprise video or audio/visual players”); Decl., ¶207. Implementing Goldberg’s scheme in the Janevski-Kawamura-Muchow and Janevski-Kawamura-Boyle systems would have used known features according to

their known functions (transmitting audio information, e.g., over the Internet), to achieve predictable results (Janevski's participant PVR downloads audio information). Decl., ¶207.

c. [5c], [11c], and [17c]: “(iii) playback timing information for audio information.”

Janevski discloses [5c], [11c], and [17c]. Decl., ¶208. Janevski discloses an “initiator” (master) “PVR” “114a” (first zone player) “sen[ding]” or “transmit[ing]” to the other “PVRs” (second zone player) “an indication of the time into the program” (timing information). Janevski, 7:36-50; Decl., ¶208.

As explained for [1aii], Janevski discloses “a status message is sent out periodically by the ‘initiator’, i.e., the PVR 114a that initiated the session” (first playback device performing the master device role). Janevski, 7:36-50; *supra* Ground 1, [1aii]; Decl., ¶209. This “status message” is received by “message recipients’ PVR 114b” (second playback device). *Id.*

This “status message” includes an “indication of the time into the program,” which discloses playback timing information for audio information because “the destination PVR can take corrective action to compensate for” timing differences and “fast forward” to “catch up content-wise with that of the sender.” Janevski, 2:23-45, 7:36-50; Decl., ¶210. Janevski discloses an “aural” broadcast, confirming that

the “indication of the time into the program” is playback timing information for audio information. Janevski, 7:36-50; 16:34-43; Decl., ¶210.

This timing indication meets the construction of “information indicating when the audio [information / content] is to be played back” because the timing indication is, for example, an “output time stamp 1 hour, 1 minute and 2 seconds” into the program which the “destination PVR” matches. Janevski, 2:23-45, 7:36-50; EX-1023; Decl., ¶211.

XI. Grounds 6A/6B: Claims 6, 12, and 18 Would Have Been Obvious Over Janevski in View of Muchow, Kawamura, and Lord and Over Janevski in View of Boyle, Kawamura, and Lord.

Lord discloses a command to add a third zone player, and it would have been obvious to include in the Janevski-Kawamura-Muchow and Janevski-Kawamura-Boyle systems. Decl., ¶212.

A. Lord

Lord matured from U.S. Patent App. Ser. No. 09/894,060 and is expressly incorporated by reference into Janevski. Janevski, 1:53-60; Lord, Cover Page.

Like Janevski, Lord relates to “synchronizing the video output of personal video recorders in two or more locations.” Lord, 1:5-9, 2:39-59. Lord’s system includes “personal video recorders 14-1 and 14-2” and discloses “[r]emote controls” for operating the PVRs. *Id.*, 3:6-12, 3:25-30.

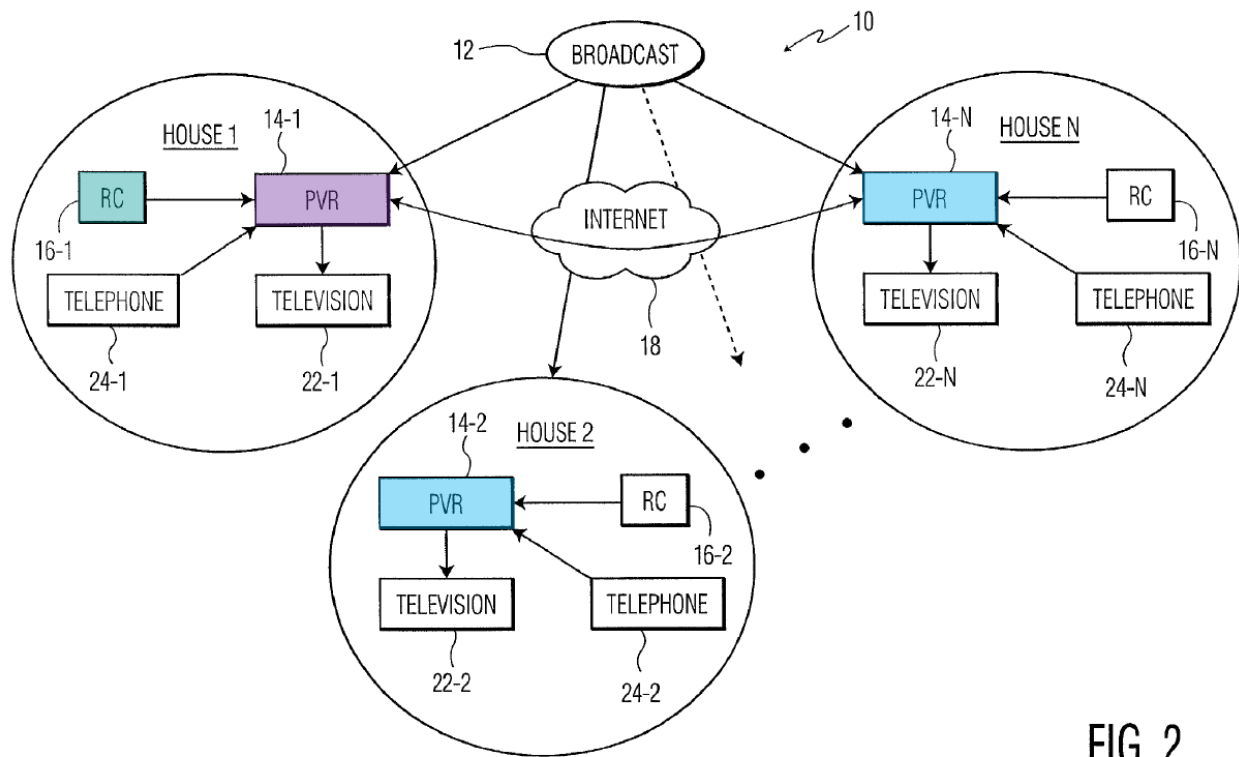


FIG. 2

Id., FIG. 2.

Lord's "buddy list" includes options to "select to join in on what the buddy is watching," which can be implemented with more than two users. *Id.*, 6:6-15. Figure 9 illustrates a "buddy list." *Id.*, 5:10-27. If a user "accepts the offer," then the users watch synchronized programming. *Id.*

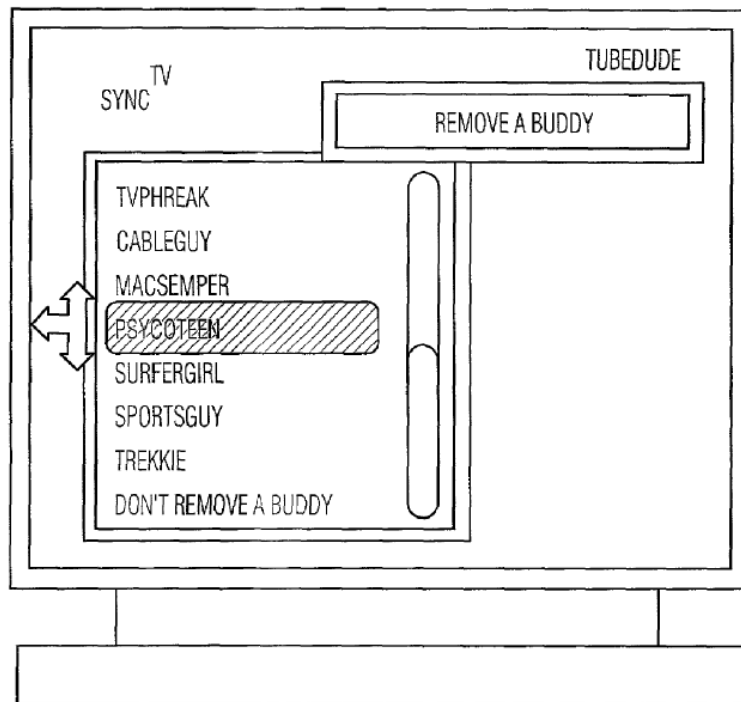


FIG. 9

Id., FIG. 9.

Like the '715 patent, Lord is in the technical field of controlling synchronous audio playback. *Compare* EX-1001, 1:25-45, 2:35-48, 5:33-39, *with* Lord, 1:1-9, 1:50-56, 2:20-22; Decl., ¶216.

B. Dependent Claims

1. Claims 6, 12, 18:

- a. [6a], [12a], [18a]: **“the first zone player receiving control information from a controller device, wherein the control information indicates that a third zone player should be added to the synchrony group; and”**

Elements [6a], [12a], and [18a] would have been obvious over the Janevski-Kawamura-Muchow and Janevski-Kawamura-Boyle systems in combination with Lord. Decl., ¶217.

Janevski discloses a third PVR (third zone player) because it “allows two or more people with personal video recorders (PVRs) to precisely synchronize their time-shifted viewing.” Janevski, 5:3-5; Decl., ¶218.

A POSITA would have been motivated to seek solutions for adding viewers to sessions because Janevski expressly contemplates that “[d]uring the session, viewers may ... be *added to the session*.” Janevski, 7:30-31; Decl., ¶219.

Lord, which is expressly incorporated by reference in its entirety into Janevski, teaches a “buddy list” for joining synchronized viewing sessions (shown in Figure 9). Lord, 5:10-27; Decl., ¶220. The buddy system allows users to request to join a session: “[o]nce [a] User 1 selects the name on the buddy list that is associated with User 2, a message appears on User 2’s screen that User 1 wants to watch television in a synchronized manner.” *Id.* Next, “User 2 is given the option of accepting or declining the offer made by User 1.” *Id.*

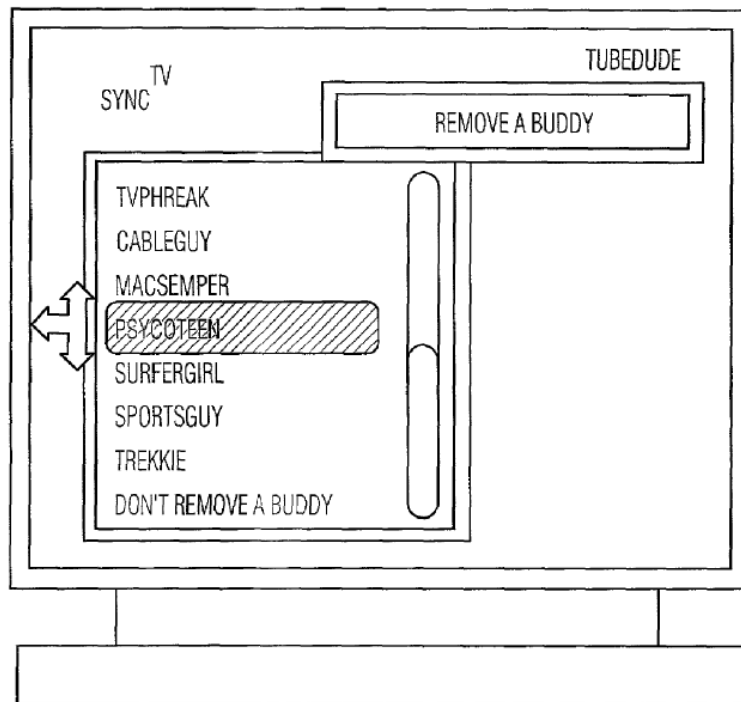


FIG. 9

Lord, FIG. 9.

Lord teaches that with “more than two users[,] ... a mechanism similar to the buddy lists discussed above can be implemented” such that “if you are on someone else’s buddy list, at any time you can investigate what that buddy is watching and select to join in on what the buddy is watching (*possibly as part of an existing collective*).” Lord, 6:6-15; Decl., ¶221.

A POSITA would have understood that, in the context of a collective three users, User 1 would have received an on “screen” “offer” “message” from a third User 3 to watch television in a synchronized manner, like the “offer” received from

User 2 in the example above. Lord, 5:20-27; Decl., ¶222. A POSITA would have understood that User 1 accepting this on “screen” “offer” “message” from User 3 discloses control information indicating that User 3’s PVR (third zone player) should be added to the session because it instructs User 1’s PVR (first zone player) to add a third “buddy” PVR to “an existing collective” (synchrony group). Lord, 5:20-27, 6:6-15; Decl., ¶222.

Finally, a POSITA also would have understood that Lord’s “accept[ance]” of the on “screen” “offer” “message” was received by the first PVR from a controller device because the user uses the “[r]emote control ... to operate the personal video recorder.” Lord, 2:22-30, 3:25-30, 4:16-23, 5:20-27, 6:6-15, 7:50-56; Decl., ¶223.

A POSITA would have been motivated to combine Lord’s buddy system into the Janevski-Kawamura-Muchow and Janevski-Kawamura-Boyle systems at least because Janevski incorporates Lord by reference and notes that “[a] series of menus for establishing a viewing session are discussed in U.S. patent application Ser. No. 09/894,060 [Lord].” Janevski, 1:53-57, 7:18-20; Decl., ¶224.

A POSITA would have been motivated to make this combination to achieve Janevski’s expressly stated goal of allowing users to “be *added to the session*.” Janevski, 7:30-31; Decl., ¶225. Moreover, Lord teaches several advantages to allowing a user to accept or decline the offers of those seeking to join the user’s viewing sessions. Lord, 5:20-24, 6:6-15, 7:50-56; Janevski, 11:4-11; Decl., ¶225. A

POSITA would have understood the buddy system's acceptance or denial "would provide privacy for the existing user and would also permit the existing users to be able to censor the programs that they are watching." Lord, 6:27-32; Decl., ¶225.

A POSITA would have reasonably expected success in combining the Janevski-Muchow-Kawamura system and Janevski-Boyle-Kawamura system with Lord because they use similar components in similar ways to achieve similar goals, including PVRs, approving of a new participant PVR to join a synchronized viewing session, and remote controls. Lord, 2:60-3:30; Janevski, 6:4-44; Decl., ¶226. Janevski, Kawamura, and Lord all use a "remote control" to control home entertainment systems. Lord, 3:25-30; Janevski, 6:40-44; Kawamura, [0088]-[0091]; Decl., ¶226. Moreover, Janevski teaches "solicit[ing]" the "approv[al]" / "consent of the user of the current participant PVRs" "via a menu screen," like how Lord teaches "accepting or declining an offer" in "a message that appears on [the user's] screen." Lord, 5:20-25; Janevski, 11:4-11; Decl., ¶226.

Janevski's PVR receiving the approval from the user's remote control (to the extent not expressly disclosed) would have used known features according to their known functions (Janevski and Kawamura's remote controls and Lord's user approval of an on-screen message), to achieve predictable results (Janevski's PVR receives control information from the user's remote control approving a third PVR to join the synchronized viewing session). Decl., ¶227.

A POSITA would have reasonably expected success in combining Lord into a system including Muchow's/Boyle's management of Janevski's master-slave role failover because Muchow and Boyle modify unrelated elements of Janevski and Kawamura compared to Lord. Decl., ¶228. Lord modifies commands received from Janevski's or Muchow's controller device, different than Muchow or Boyle. *Supra* Grounds 1/2, [1bi]-[1di]). Decl., ¶228.

- b. [6b], [12b], [18b]: “in response to receiving the control information, the first zone player transmitting slave control information to the third zone player, wherein the slave control information enables the third zone player to join the synchrony group as a slave device of the synchrony group.”**

Janevski discloses [6a], [12a], and [18a]. Decl., ¶229. Janevski discloses that after “approv[al]” (control information), “[t]he initiator PVR 114a, in response” (in response to the receiving the control information) “sends an originating synchronization message 402 to the new participant PVR 114b” (transmitting slave control information). Janevski, 11:4-17; Decl., ¶229.

Janevski explains that “[i]f the users of current participant PVRs 114a, b approve,” “the potential participant PVR 114b becomes a new participant PVR 114b, to be synchronized with the initiator PVR 114a.” Janevski, 11:4-17; Decl., ¶230. The subsequent actions allowing the “new participant PVR 114b” to join are taken in response to the requisite “approv[al].” *Id.*

Subsequent to the “approv[al],” “the new participant PVR 114b notifies the initiator PVR 114a that it is joining the current session.” Janevski, 11:4-17; Decl., ¶231. “The initiator PVR 114” (first zone player) “in response, sends an originating synchronization message 402” (transmits slave control information) “to the new participant PVR 114b” (third zone player). *Id.*

The “originating synchronization message” disclose slave control information because it enables the “new participant” (third zone player) to join the “synchronized viewing session” (synchrony group) as a “participant PVR 114b” (slave device) by instructing it to “advance[] [its] time count” to “be synchronized with the initiator PVR 114a” (master device). Janevski, 11:4-21; Decl., ¶232.

XII. *Sotera* Stipulation

Petitioner stipulates that, if the Board institutes IPR2025-01590 based on the grounds presented herein, Petitioner will not pursue in *Sonos, Inc. v. Google LLC*, No. 2:20-cv-00169 (C.D. Cal.) an invalidity defense based on any ground raised or that could have been reasonably raised in IPR2025-01590. *Sotera Wireless, Inc. v. Masimo Corp.*, IPR2020-01019, Paper 12, 18 (PTAB Dec. 1, 2020) (precedential). If the Board denies institution or institutes and later vacates institution of IPR2025-01590, Google reserves the right to pursue in *Sonos*, No. 2:20-cv-00169, any ground that was raised or reasonably could have been raised in IPR2025-01590.

XIII. Discretionary Denial Would be Inappropriate

The Board should reach the merits of this petition and should not exercise its discretion to deny based on 35 U.S.C. §325(d) because the *Advanced Bionics* factors favor institution. Of the references used in this Petition, only Goldberg was previously relied upon by the Office, but never in the combinations presented herein. Thus, the same or substantially the same art or arguments were not previously presented to the Office. And, because the Office never considered the other references or the specific combinations presented in the Petition, the Examiner materially erred by failing to consider and apply them.

Discretionary denial under 35 U.S.C. §314(a) is not appropriate because the *Fintiv* factors weigh in favor of institution and Patent Owner has no settled expectations. Petitioner includes a *Sotera* stipulation, removing duplication, it has challenged claims beyond just those asserted in the parallel litigation, the trial date is yet uncertain for this patent given the large number of patents at issue in the parallel litigation, and Petitioner's arguments on the merits here are strong. The '715 patent issued in 2018, so Patent Owner has no long-settled expectation of validity.

Petitioner will address the discretionary factors in full during the bifurcated briefing process.

XIV. Mandatory Notices

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

Google LLC is the real party-in-interest for this Petition.⁶

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

To the best of Petitioner's knowledge, the '715 patent is involved in the following district court litigations:

Name	Number	Court	Filed
<i>Sonos, Inc. v. Google LLC</i>	2:20-cv-00169	C.D. Cal.	Jan. 7, 2020

⁶ Google LLC is a subsidiary of XXVI Holdings Inc., a subsidiary of Alphabet Inc.

XXVI Holdings Inc. and Alphabet Inc. are not real parties-in-interest here.

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

Lead Counsel	Back-Up Counsel
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D. Service Information Under 37 C.F.R. § 42.8(b)(4)

Please address correspondence to lead and back-up counsel at the e-mail addresses above. Petitioner consents to electronic service by e-mail.

XV. Standing

Petitioner certifies that the '715 patent is available for IPR, and Petitioner is not barred or estopped from requesting IPR on the grounds identified in this Petition.

XVI. Conclusion

Petitioner has established a reasonable likelihood of prevailing for the challenged claims and requests the Board institute IPR and cancel each challenged claim as unpatentable.

Date: October 13, 2025

Respectfully submitted,

/Erika H. Arner/
Erika H. Arner, Lead Counsel
Reg. No. 57,540

CERTIFICATE OF COMPLIANCE

The undersigned hereby certifies that the foregoing **Petition for *Inter Partes* Review** contains 13,947 words, excluding those portions identified in 37 C.F.R. § 42.24(a), as measured by the word-processing system used to prepare this paper.

/Erika H. Arner/
Erika H. Arner, Lead Counsel
Reg. No. 57,540

CERTIFICATE OF SERVICE

The undersigned certifies that the foregoing **Petition for *Inter Partes* Review, associated Power of Attorney, and Exhibits 1001-1025** were served on October 13, 2025, by FedEx Priority Overnight® on the correspondence address of record indicated in the Patent Office's public Patent Center system for U.S. Patent No. 10,031,715:

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