

Exhibit 953-01: Janevski

U.S. Patent No. 7,269,338 (“Janevski”) was filed on December 11, 2001, published on August 21, 2003, and issued on September 11, 2007. Accordingly, Janevski constitutes prior art to U.S. Patent No. 10,209,953 (the “’953 Patent”) under at least 35 U.S.C. §§ 102(a), (b), and/or (e).

Janevski, including any material incorporated by reference into Janevski, anticipates claims 7, 8, 12, 13, 14, 18, 22, 23, 24, 25, 28, 29, and 30 (the “asserted claims”) of the ’953 patent under 35 U.S.C. §§ 102(a), (b), and/or (e).

To the extent any limitation is found not to be expressly or inherently disclosed in Janevski, such a limitation would have been obvious either based on Janevski alone, given the state of the art, or in combination with one or more of the references cited in Exhibits 953-01 through 953-09 or Exhibit 953-B, because the ’953 Patent is merely a collection of prior art elements that fails to meet the statutory requirement of non-obviousness under 35 U.S.C. § 103, and the factors delineated in *KSR Int’l Co. v. Teleflex, Inc.*, 550 U.S. 398 (2007), weigh against a finding of non-obviousness.

Any disclosures identified for each limitation of the ’953 Patent in the aforementioned Exhibits may be combined with the disclosures of Janevski identified below for the same limitation to render that limitation obvious. A POSITA would have found such a combination/modification obvious for the reasons discussed herein and in Defendant’s cover pleading.¹

The citations to portions of any reference in this chart are exemplary only. Citations to the written description should be interpreted to include the figures associated with or relevant to the cited passages. Similarly, citations to a figure should be understood to encompass any description, text, or discussion of that figure. Defendant reserves the right to use the entirety of any reference cited in this chart to show that the asserted claims are anticipated and/or are obvious. Citations presented for one claim limitation are expressly incorporated by reference into all other limitations for that claim as well as all limitations of all claims on which that claim depends.

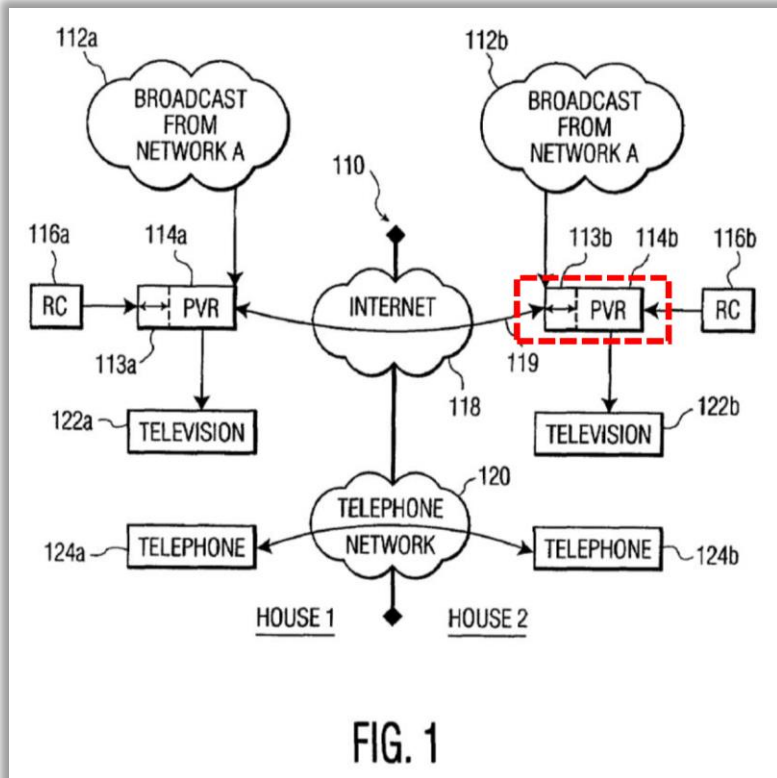
¹ Plaintiff appears in many instances to be pursuing overly broad constructions of limitations of the asserted claims in an effort to piece together an infringement claim where none exists. This claim chart accounts for overly broad construction of the claim limitations. Any assertion that a particular limitation is disclosed by a prior art reference or references may be based on Plaintiff’s apparent constructions and is not intended to be, and is not, an admission that such constructions are supportable or proper. Defendant is investigating this prior art and has not yet completed discovery from third parties, who may have relevant information concerning the prior art. Therefore, Defendant reserves the right to supplement this chart after additional discovery is received. To the extent that any of the prior art discloses the same or similar functionality or feature(s) of any of the accused products, Defendant reserves the right to argue that said feature or functionality does not practice any limitation of any of the asserted claims, and to argue, in the alternative, that if said feature or functionality is found to practice any limitation of any of the asserted claims, then the prior art reference teaches the limitation and that the claim is not patentable.

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Defendant reserves the right to rely on additional citations or sources of evidence that also may be applicable, or that may become applicable in light of claim construction, changes in Plaintiff's infringement contentions, and/or information obtained during discovery as the case progresses.

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<p>7[pre] A first zone player comprising:</p>
<p>Defendant does not concede that the preamble is limiting. To the extent it is limiting, Janevski discloses the preamble. For example, Janevski discloses synchronously playing back the same renderable content by different participants (e.g., PVRs). <i>See, e.g.</i>, the following:</p> <p>“Content of multiple digital bit streams with essentially the same renderable content, and situated at mutually remote locations, are played back in unison. First, time is synchronized among the processors that participate in a synchronized viewing session by playing back respective streams. Second, the playbacks are content-wise aligned, by rewinding or fast forwarding, to effect overall a precisely synchronized presentation. The content-wise alignment is achieved by means of a status message between processors that contains information characteristic of the sender's bit stream. If any participant, performs a control function (e.g. rewind, fast forward, stop), all other participants follow synchronously. The processor that initiates the session is deemed the initiator, a role that is thereafter assumed by the participant that has last performed a control function. The initiator directs all participants, at session startup, upon execution of each control function, and periodically, to synchronize their playbacks to that of the initiator, whereby all playbacks are synchronized and maintain in synchronization.” Janevski at Abstract.</p> <p>“Referring to FIG. 1, an example of a synchronized PVR viewing system 110 in accordance with the present invention is illustrated... As the broadcasts 112 a, b enter House 1 and House 2, respectively, they are received by receivers 113 a, b housed within each of the respective PVRs 114 a, b. Hereinafter, the suffix ‘a’ refers to the ‘initiator’, and the suffix ‘b’ refers to a ‘participant’, in a synchronized viewing session. Initially, the ‘initiator’ is the PVR that starts the session, although that role is handed off to any PVR that, as directed by its user, performs a control function (e.g., stop, pause, fast forward, reverse). All other PVRs participating in the session are ‘participants’. Depending on context, the user of the initiator PVR is referred to as the ‘initiator’, and the user of a participant PVR is referred to as a ‘participant.’” <i>Id.</i> at 6:5-22.</p>

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Id. at Fig. 1 (annotated).

“In one aspect, the present invention is directed to an apparatus for synchronizing presentation of renderable content of two digital bit streams that reside in respective storage media. Renderable content, as used herein, refers to content that is presentable in a form that a user can sense, e.g. visually or aurally. The apparatus includes a stream characteristic unit for deriving information characteristic of content of one of said streams and comparing the information to information characteristic of content of the other stream. Content of the one stream is played back by progressing forward in the one stream. The presentation is synchronized by modifying that progress based on the comparison.” *Id.* at 5:7-19.

“This invention applies generally to synchronizing presentation of renderable content of two or more digital bit streams. The presentation may be merely visual or merely aural or both visual and aural. The bit streams need not contain both image and audio data. Thus, the characteristic information may be characteristic of viewable images or of audible sounds. Nor is it necessary that the characteristic information comprise signatures. For example, image and/or audio transform coefficients, as appropriate, can be used to characterize the content of the bit streams.” *Id.* at 16:34-43.

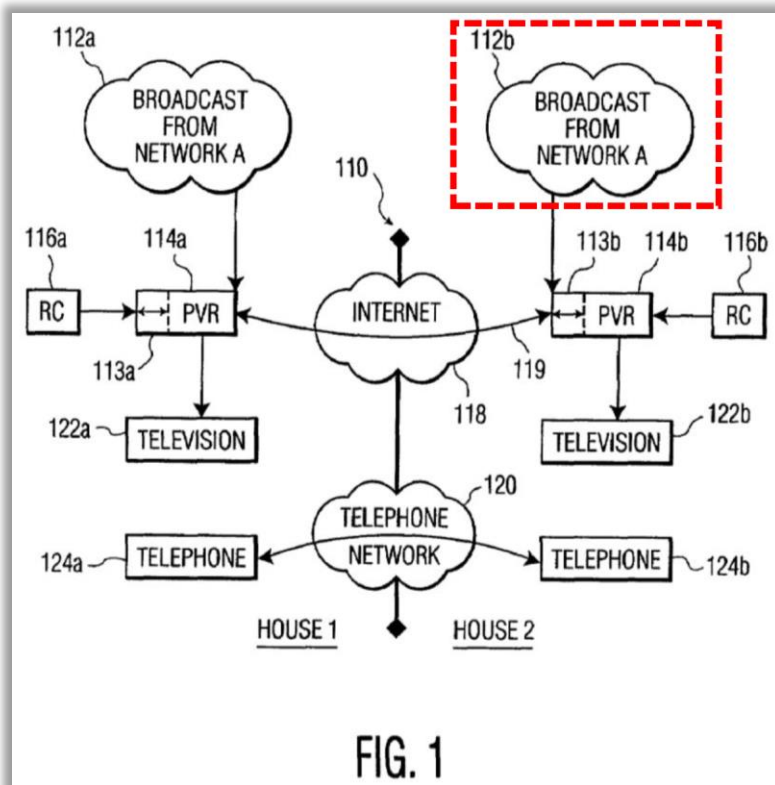
Each PVR is connected to a data network, as discussed with respect to claim 7[a], *infra*.

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<p>To the extent that Janevski is found not to disclose the preamble, it would have been obvious based on the disclosures of Janevski alone or in combination with the disclosures of one or more of the references cited for this limitation in Exhibits 953-01 through 953-09 or Exhibit 953-B for the reasons discussed herein and in Defendant's cover pleading.</p>
<p>7[a] a network interface that is configured to provide an interconnection with at least one data network;</p>
<p>Janevski discloses this feature. For example, Janevski discloses that the first zone player (e.g., PVR 114b) includes a receiver (e.g., 113b), which is a physical component that provides an interconnection with a data network (e.g., broadcast network A) and with other zone players (e.g., PVR 114a) over the Internet. <i>See, e.g.</i>, the following:</p> <p>"The system 110 preferably has two communication networks associated therewith. The first is an Internet network 118 that interconnects the PVRs 114 a, b located at the two different locations (e.g. House 1 and House 2). The Internet network 118 supplies the means 119 for communicating information between the PVRs 114 a, b such that synchronization may be achieved." <i>Id.</i> at 6:45-51.</p> <p>"Copending U.S. patent application Ser. No. 09/894,060, entitled 'Synchronized Personal Video Recorders', filed Jun. 28, 2001, assigned to the assignee of the instant application, incorporated herein by reference, and not admitted to be prior art by its mention in the background section, discloses a system in which one PVR synchronizes with another PVR by sending out a status message to the other PVR. The message issues when the user of the initiator PVR operates a PVR function such as start up, fast forward or rewind, to allow the recipient of the message to perform the counterpart function to keep the presentation on both PVRs synchronized. The message is also transmitted periodically, to update the synchronization. Within the message is an identifier of the program being watched or to be watched, an indicator of the mode of watching (e.g. normal play, fast forward, pause, etc.), and the time or frame into the program. The time or frame allows the recipient PVR to synchronize its replay with that of the sending PVR, by comparing the time or frame in the message with its own the current time or frame." <i>Id.</i> at 1:53-2:5.</p> <p>"In expanding on this concept of synchronizing a sending PVR with a recipient PVR by transmitting a time or frame from the sending PVR to the recipient PVR, it will be initially assumed, for purposes of illustrating the present invention, that both PVRs are playing back respective, identical copies of a video. The frame of the sending PVR is part of the sender's copy of the video, which resides in a bit stream that is stored in a storage medium. Similarly, frames of recipient PVR's copy of the video reside in a bit stream that is stored in the recipient's storage medium." <i>Id.</i> at 2:6-15.</p> <p>"Referring to FIG. 1, an example of a synchronized PVR viewing system 110 in accordance with the present invention is illustrated. As illustrated in FIG. 1, broadcasts 112 a, b of a television program from network A is made pursuant to any communication means known to</p>

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one having ordinary skill in the art, such as cable, digital cable, satellite, antenna, over the Internet or combinations thereof. The same network production, e.g., specific baseball game, is transmitted to each of House 1 and House 2. As the broadcasts 112 a, b enter House 1 and House 2, respectively, they are received by receivers 113 a, b housed within each of the respective PVRs 114 a, b.” *Id.* at 6:5-16.



Id. at Fig. 1 (annotated).

“More than two users may participate in a synchronized viewing session; for example, users in three or more remote locations may arrange mutually by phone, by menus, by e-mail, by Internet chat, etc., to view a particular program simultaneously. During the session, viewers may drop out or be added to the session. When any session participant performs a control function (e.g., start, pause, rewind, fast forward), that participant's PVR 114 b broadcasts a command for that function that is immediately communicated and effected in the PVR 114 b of each participant, to keep the presentation synchronized. To ensure that the PVRs 114 a, b participating in a session remain synchronous, a status message is sent out periodically by the ‘initiator’, i.e., the PVR 114 a that initiated the session. The status message is also transmitted with each command that is broadcasted in response to a participant performing a control function. The status message includes an indication of the program being watched, 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 from which playback to the message sender is

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being generated. The characteristic information is used to ‘fine tune’ the synchronization by zeroing in on similar content being viewed on the message recipients’ PVR 114 b.” *Id.* at 7:25-50.

“FIG. 2 provides a more detailed look at an exemplary PVR 114 a in accordance with the present invention. Although the initiator PVR is shown, and, hence, the suffix ‘a’ is used, any participant PVR would generally have the same architecture, because the role of initiator is handed off during a session to the latest PVR performing a control function. The PVR 114 a includes a receiver 113 a, and a video processing unit 201 comprised of a microprocessor 202, a remote control sensor 204, and a digital memory 206. The microprocessor 202 includes an image or video player 208, a stream characteristics unit 210, a video timer 212 and a period timer 213. The digital memory 206 includes a synchronization register 214, a signature processing workspace 216 a video block 218, a status buffer 220 and miscellaneous storage 222. The remote control sensor 204 receives a signal from the remote control 116 a, operated by a user or viewer of the television 122 a, and conveys a corresponding signal to the microprocessor 202. The microprocessor 202 reads from and writes to the digital memory 206.” *Id.* at 7:51-8:3.

“FIG. 5 illustrates an example of message formats utilized in the present invention to perform time synchronization. Referring back to any of Cases\ 1, 2 or 3 in FIG. 4, the originating message 402, at the time it is transmitted by the initiator PVR 114 a, has a field 510 containing time stamp A (corresponding to time A in FIG. 4), as shown in the first format in FIG. 4. Upon arrival at the participant PVR 114 b, a field 520 containing time stamp B is added to the originating message 402, as shown in the second format. Just prior to sending the reply message 404 back to the initiator PVR 114 a, the participant PVR 114 b also adds a field 530 containing time stamp C, as shown in the third format, to convert the originating message 402 to the reply message 404. The initiator PVR 114 a receives the reply message 404 at time D (as in FIG. 4), calculates the time misregistration, TM, based on formula (1), and places the calculated time misregistration 540 into a status message 550, into which it also inserts a program identifier 560, watching mode 570, a query signature 580 and a query time stamp 590. The program identifier 560 identifies the video 308 that is currently playing. The watching mode 570 is control information for controlling processing of the PVRs 114 a, b and denotes the state of the PVRs 114 a, b, as discussed further below.” *Id.* at 10:4-27.

“As seen in the ongoing session join process of FIG. 6, the new participant PVR 114b notifies the initiator PVR 114 a that it is joining the current session (step S602). The initiator PVR 114 a, in response, sends an originating synchronization message 402 to the new participant PVR 114 b (step S604). Upon receipt, the new participant PVR 114 b advances the time count of its video timer 212 so that the value of the time count matches time stamp A contained in the message 402, and, correspondingly, fast forwards its copy of video 308 (step S606). The point in the playback fast forwarded to corresponds to the value of the advanced time count, so that the new participant's playback has caught up content-wise with the playback of the initiator. The new participant PVR 114 b then transmits to the initiator PVR 114 a a join request message (step S608), to proceed with a fine tuning of its synchronization with the initiator PVR 114 a by means of time synchronization followed by frame synchronization. FIGS. 7A and 7B are flowchart

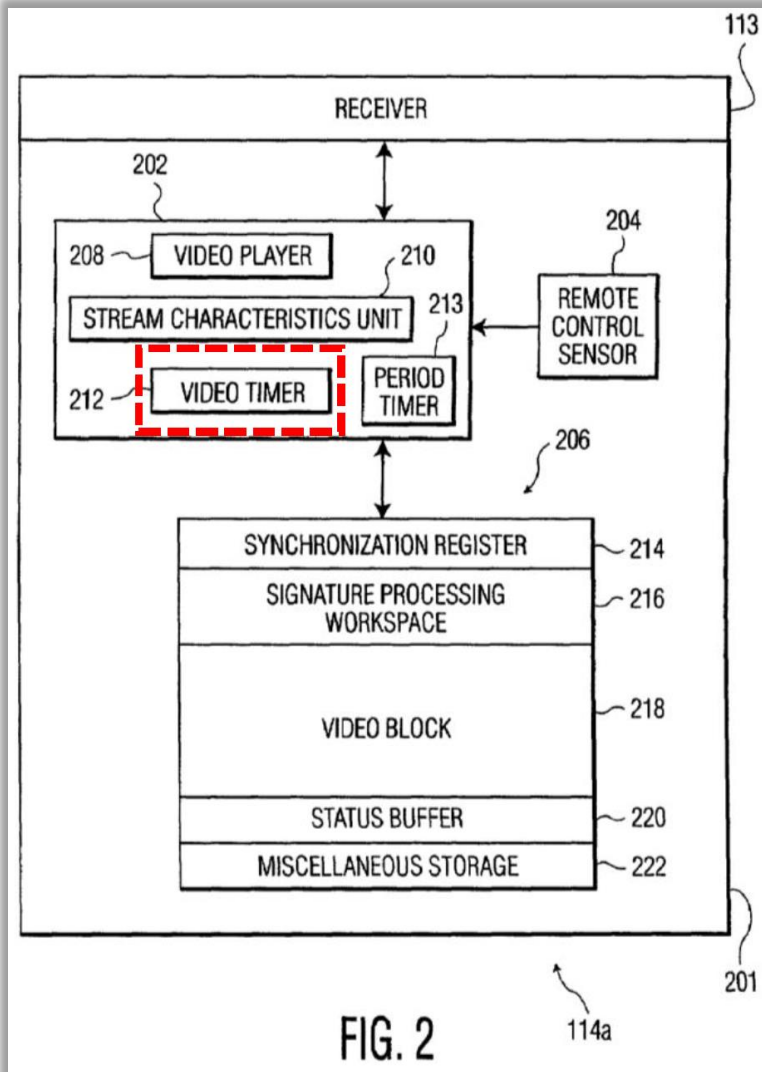
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<p>depictions of an example of time synchronization according to the present invention. In the current example, there are five possible triggering events for the synchronization process: (1) start of a session, (2) the initiator's period timer 213 expires, (3) the initiation of a control function, (4) a retry request message is received, or (5) a join request message is received (step S701). The initiator's period timer 213 counts the time interval until the initiator will again synchronize the session participants. A retry request message is issued by a participant to the initiator when an attempted frame synchronization has been unsuccessful, and requests that synchronization with the participant be retried after a predetermined period of time.” <i>Id.</i> at 11:12-42.</p>
<p>“Next, the microprocessor 202 of the initiator's PVR 114 a checks its video timer 212, places its time count as time stamp A into field 510 of the originating synchronization message 402, and transmits the message 402 (step S704). The microprocessor 202 of the participant's PVR 114 b checks its video timer 212 upon receipt of message 402 and saves the time count as time stamp B in field 520 of the message 402. The participant's PVR 114 b further augments the originating synchronization message 402, and thereby transforms the originating synchronization message 402 into the reply synchronization message 404, by creating field 530 and placing time stamp C from the participant's video timer 212 into field 530 of message 402. The participant's PVR 114 b then immediately transmits the reply message 404 to the initiator's PVR 114 a (step S705). Upon receipt of reply message 404, the initiator's microprocessor 202 checks its video timer 212 for the time of receipt, time D, and uses it, together with the time stamps in the fields of the message 404, to determine the time misregistration 540, TM, based on formula (1).” <i>Id.</i> at 11:52-12:4.</p>
<p>“Although the copies of video 308 are described as recorded from broadcasts, this is not a limitation. The video copies could be downloaded from a service provider or compact discs containing the video copies could be inserted into the respective PVRs. The video copies whose playback is being synchronized need not be remotely located, nor locally located at their respective PVRs.” <i>Id.</i> at 16:10-16.</p>
<p>To the extent that Janevski is found not to disclose this feature, it would have been obvious based on the disclosures of Janevski alone or in combination with the disclosures of one or more of the references cited for this limitation in Exhibits 953-01 through 953-09 or Exhibit 953-B for the reasons discussed herein and in Defendant’s cover pleading.</p>
7[b] a clock that is configured to provide a clock time of the first zone player;
<p>Janevski discloses this feature. For example, Janevski discloses that the zone players (e.g., PVRs) include a microprocessor (see claim 7[c], <i>infra</i>), which includes a timer that provides time value indicated by the respective zone players. <i>See, e.g.</i>, the following:</p>
<p>“If, for example, the destination PVR’s video timer reads 1 hour, 1 minute and 1 second at a time when the destination PVR receives from the sending PVR a message having as its output time stamp 1 hour, 1 minute and 2 seconds (set according to the sending PVR’s video timer),</p>

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this might indicate the destination PVR's playback is one second behind that of the sending PVR."). It might be the case, for example, that, according to the timing of a single reference clock, the destination PVR started its playback one second after the sending PVR started its playback." *Id.* at 2:23-32.

"FIG. 2 provides a more detailed look at an exemplary PVR 114 a in accordance with the present invention. Although the initiator PVR is shown, and, hence, the suffix "a" is used, any participant PVR would generally have the same architecture, because the role of initiator is handed off during a session to the latest PVR performing a control function. The PVR 114 a includes a receiver 113 a, and a video processing unit 201 comprised of a microprocessor 202, a remote control sensor 204, and a digital memory 206. The microprocessor 202 includes an image or video player 208, a stream characteristics unit 210, a video timer 212 and a period timer 213. The digital memory 206 includes a synchronization register 214, a signature processing workspace 216 a video block 218, a status buffer 220 and miscellaneous storage 222. The remote control sensor 204 receives a signal from the remote control 116 a, operated by a user or viewer of the television 122 a, and conveys a corresponding signal to the microprocessor 202. The microprocessor 202 reads from and writes to the digital memory 206." *Id.* at 7:51-8:3.

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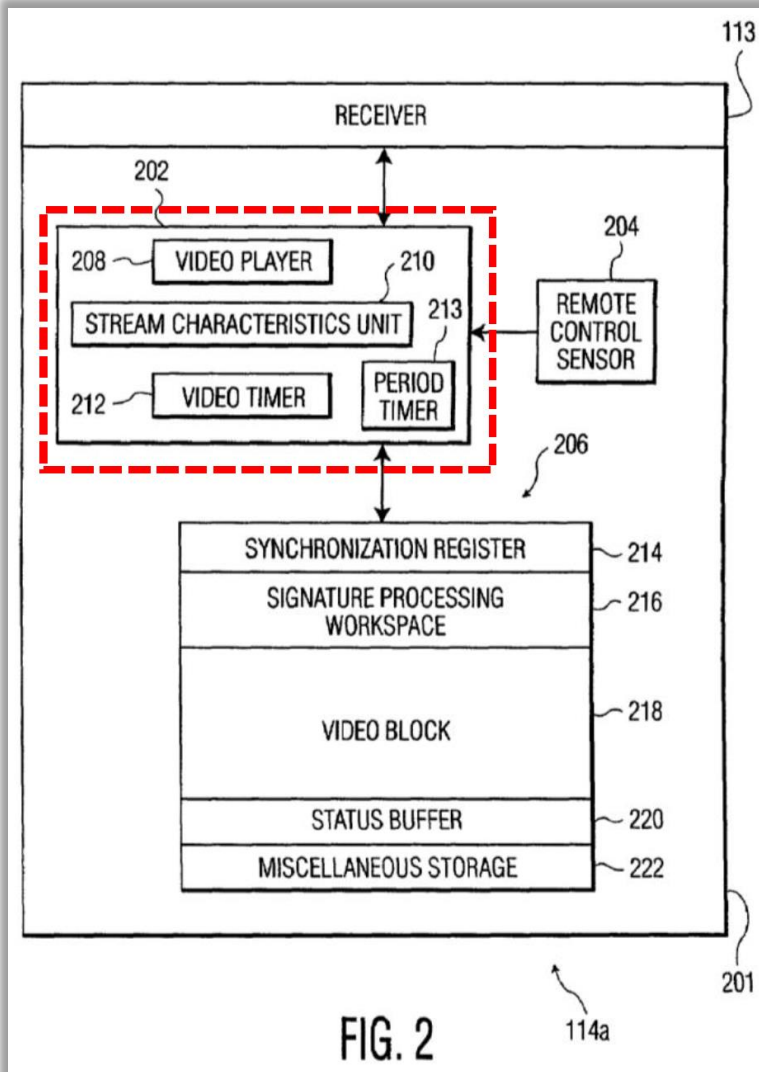


Id. at Fig. 2 (annotated).

“Next, the microprocessor 202 of the initiator's PVR 114 a checks its video timer 212, places its time count as time stamp A into field 510 of the originating synchronization message 402, and transmits the message 402 (step S704). The microprocessor 202 of the participant's PVR 114 b checks its video timer 212 upon receipt of message 402 and saves the time count as time stamp B in field 520 of the message 402. The participant's PVR 114 b further augments the originating synchronization message 402, and thereby transforms the originating synchronization message 402 into the reply synchronization message 404, by creating field 530 and placing time stamp C from the participant's video timer 212 into field 530 of message 402. The participant's PVR 114 b then immediately transmits the reply message 404 to the initiator's PVR 114 a (step S705). Upon receipt of reply message 404, the initiator's microprocessor 202 checks its video timer 212 for the time of receipt, time D, and uses it, together with the time stamps in the fields of the

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<p>message 404, to determine the time misregistration 540, TM, based on formula (1).” <i>Id.</i> at 11:53-12:4.</p> <p><i>See also</i> IPR2018-00766, Petitioner’s Reply at 24.</p> <p>To the extent that Janevski is found not to disclose this feature, it would have been obvious based on the disclosures of Janevski alone or in combination with the disclosures of one or more of the references cited for this limitation in Exhibits 953-01 through 953-09 or Exhibit 953-B for the reasons discussed herein and in Defendant’s cover pleading.</p>
7[c] at least one processor;
<p>Janevski discloses this feature. For example, Janevski discloses that the zone players (e.g., PVRs) include a microprocessor. <i>See, e.g.</i>, the following:</p> <p>“FIG. 2 provides a more detailed look at an exemplary PVR 114 a in accordance with the present invention. Although the initiator PVR is shown, and, hence, the suffix “a” is used, any participant PVR would generally have the same architecture, because the role of initiator is handed off during a session to the latest PVR performing a control function. The PVR 114 a includes a receiver 113 a, and a video processing unit 201 comprised of a microprocessor 202, a remote control sensor 204, and a digital memory 206. The microprocessor 202 includes an image or video player 208, a stream characteristics unit 210, a video timer 212 and a period timer 213. The digital memory 206 includes a synchronization register 214, a signature processing workspace 216 a video block 218, a status buffer 220 and miscellaneous storage 222. The remote control sensor 204 receives a signal from the remote control 116 a, operated by a user or viewer of the television 122 a, and conveys a corresponding signal to the microprocessor 202. The microprocessor 202 reads from and writes to the digital memory 206.” <i>Id.</i> at 7:51-8:3.</p>

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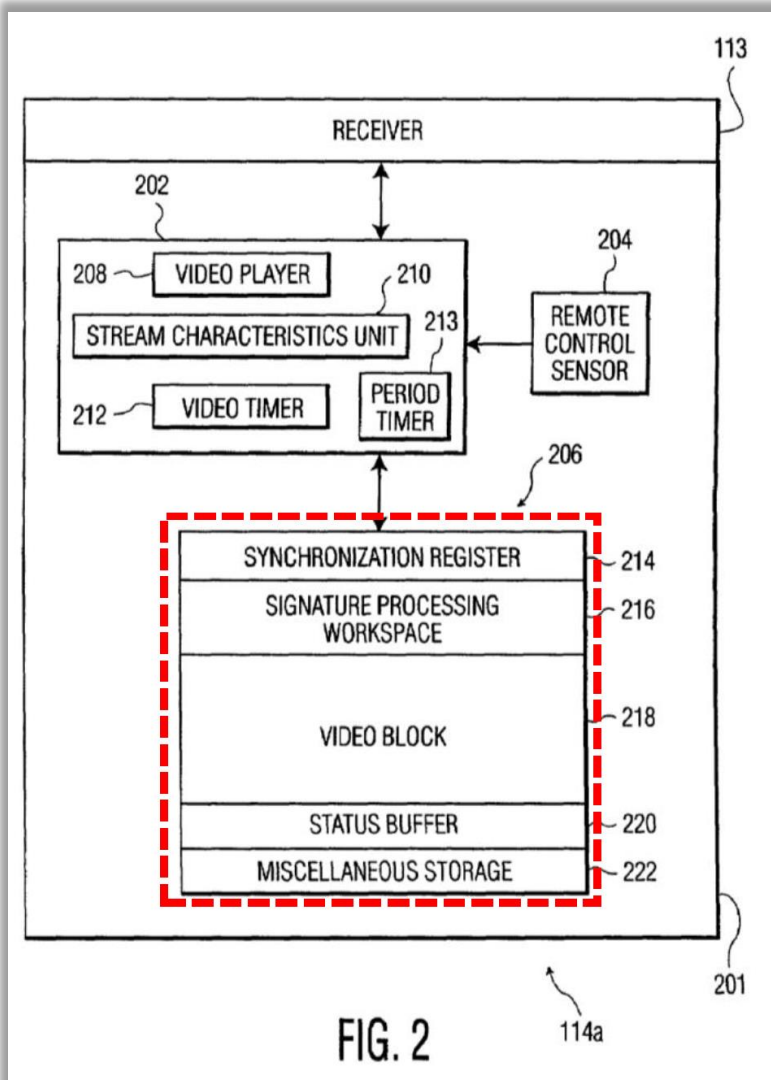


Id. at Fig. 2 (annotated).

“Next, the microprocessor 202 of the initiator's PVR 114 a checks its video timer 212, places its time count as time stamp A into field 510 of the originating synchronization message 402, and transmits the message 402 (step S704). The microprocessor 202 of the participant's PVR 114 b checks its video timer 212 upon receipt of message 402 and saves the time count as time stamp B in field 520 of the message 402. The participant's PVR 114 b further augments the originating synchronization message 402, and thereby transforms the originating synchronization message 402 into the reply synchronization message 404, by creating field 530 and placing time stamp C from the participant's video timer 212 into field 530 of message 402. The participant's PVR 114 b then immediately transmits the reply message 404 to the initiator's PVR 114 a (step S705). Upon receipt of reply message 404, the initiator's microprocessor 202 checks its video timer 212 for the time of receipt, time D, and uses it, together with the time stamps in the fields of the

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<p>message 404, to determine the time misregistration 540, TM, based on formula (1).” <i>Id.</i> at 11:53-12:4.</p> <p>“Assuming that user 1 takes the lead as the ‘initiator’, user 1, via a remote control 116, via controls on the PVR 114 a itself, or via control commands displayed on the television and activated by an input device such as a keyboard or remote controller, would activate a menu for synchronized viewing on the PVR 114 a. User 1 would respond to and send the menu. Resulting other menus would be sent to user 2. The users would each indicate by their respective response to the menus they received whether or not they will be participating in the session. Based on the responses, a synchronized viewing session is established to begin at an agreed upon time. The agreed upon time may be a universal time, such as 9:00 P.M., or a relative time, such as in 5 minutes. A series of menus for establishing a viewing session are discussed in U.S. patent application Ser. No. 09/894,060, described above. A memory device and a processor preferably reside in either the PVRs 114 a, b or one of the other devices associated with system 110. Programming code associated with the system 110 preferably resides in the memory device and is processed by the processor.” <i>Id.</i> at 7:4-24.</p> <p>To the extent that Janevski is found not to disclose this feature, it would have been obvious based on the disclosures of Janevski alone or in combination with the disclosures of one or more of the references cited for this limitation in Exhibits 953-01 through 953-09 or Exhibit 953-B for the reasons discussed herein and in Defendant’s cover pleading.</p>
7[d] a tangible, non-transitory computer-readable medium; and
<p>Janevski discloses this feature. For example, Janevski discloses that the zone players (e.g., PVRs) include a tangible, non-transitory computer-readable memory (e.g., a memory device or digital memory) having instructions stored thereon. <i>See, e.g.,</i> the following:</p> <p>“FIG. 2 provides a more detailed look at an exemplary PVR 114 a in accordance with the present invention. Although the initiator PVR is shown, and, hence, the suffix ‘a’ is used, any participant PVR would generally have the same architecture, because the role of initiator is handed off during a session to the latest PVR performing a control function. The PVR 114 a includes a receiver 113 a, and a video processing unit 201 comprised of a microprocessor 202, a remote control sensor 204, and a digital memory 206. The microprocessor 202 includes an image or video player 208, a stream characteristics unit 210, a video timer 212 and a period timer 213. The digital memory 206 includes a synchronization register 214, a signature processing workspace 216 a video block 218, a status buffer 220 and miscellaneous storage 222. The remote control sensor 204 receives a signal from the remote control 116 a, operated by a user or viewer of the television 122 a, and conveys a corresponding signal to the microprocessor 202. The microprocessor 202 reads from and writes to the digital memory 206.” <i>Id.</i> at 7:51-8:3.</p>

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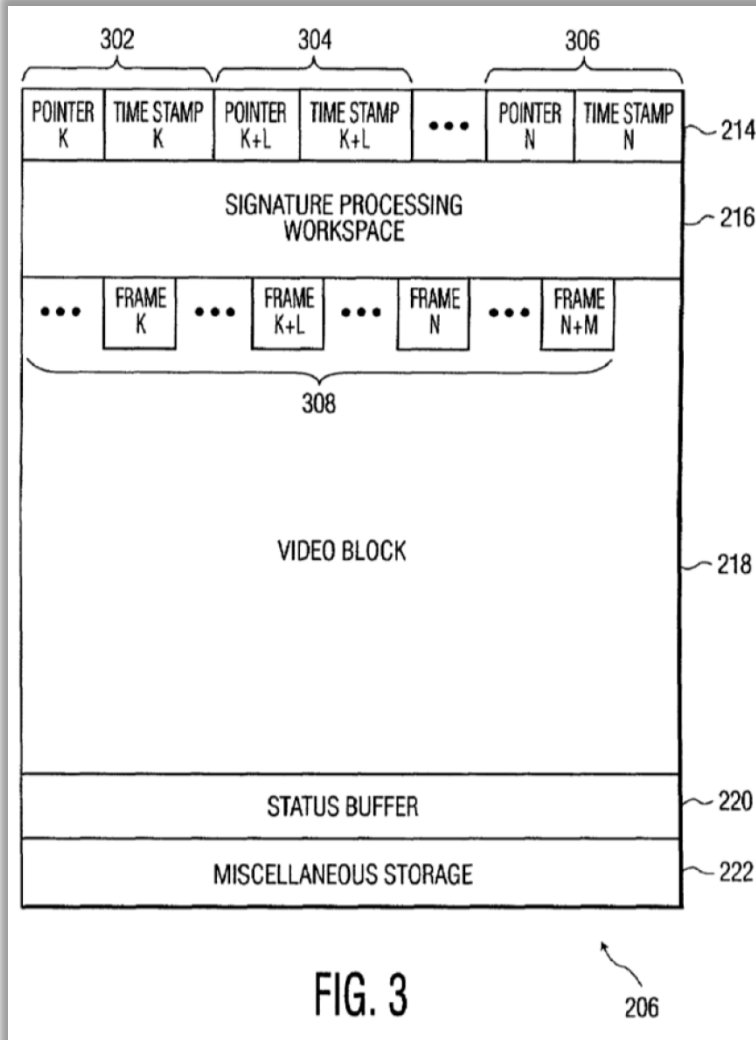


Id. at Fig. 2 (annotated).

“FIG. 3 shows, in more detail, an exemplary structure of the digital memory 206. The synchronization register 214 is of the left-shifting, non-circular type and contains entries 302, 304, 306 and other intervening entries indicated by the dots. The video block 218 contains a program or video 308 having video frames K, K+L, N, N+M and leading and intervening frames indicated by the dots. Some of the frames between frames K and N, inclusive, correspond to respective entries that presently exist in the register 214. Thus, for instance, entry 302 consists of a pointer K to frame K, and a time stamp K corresponding to the time of playing of frame K. The entry 304 consists of a pointer K+L to the frame K+L, and a time stamp K+L corresponding to the time of playing of frame K+L. The dots between frames K and K+L indicate that there are intervening frames; yet, there are no corresponding entries in synchronization register 214.

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The reason for this lack of correspondence is that frames K and K+L are 'I frames', whereas none of the frames intervening between frames K and K+L are 'I frames'." *Id.* at 8:4-38.



Id. at Fig. 3.

"Assuming that user 1 takes the lead as the 'initiator', user 1, via a remote control 116, via controls on the PVR 114 a itself, or via control commands displayed on the television and activated by an input device such as a keyboard or remote controller, would activate a menu for synchronized viewing on the PVR 114 a. User 1 would respond to and send the menu. Resulting other menus would be sent to user 2. The users would each indicate by their respective response to the menus they received whether or not they will be participating in the session. Based on the responses, a synchronized viewing session is established to begin at an agreed upon time. The agreed upon time may be a universal time, such as 9:00 P.M., or a relative time, such as in 5

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<p>minutes. A series of menus for establishing a viewing session are discussed in U.S. patent application Ser. No. 09/894,060, described above. A memory device and a processor preferably reside in either the PVRs 114 a, b or one of the other devices associated with system 110. Programming code associated with the system 110 preferably resides in the memory device and is processed by the processor.” <i>Id.</i> at 7:4-24.</p> <p>To the extent that Janevski is found not to disclose this feature, it would have been obvious based on the disclosures of Janevski alone or in combination with the disclosures of one or more of the references cited for this limitation in Exhibits 953-01 through 953-09 or Exhibit 953-B for the reasons discussed herein and in Defendant’s cover pleading.</p>
<p>7[e] program instructions stored on the tangible, non-transitory computer-readable medium that are executable by the at least one processor to cause the first zone player to perform functions comprising:</p>
<p>Janevski discloses this feature. For example, Janevski discloses that the zone players (e.g., PVRs) have associated programming code that resides in the memory device and is processed by the processor. <i>See, e.g.</i>, the following:</p> <p>“Assuming that user 1 takes the lead as the ‘initiator’, user 1, via a remote control 116, via controls on the PVR 114 a itself, or via control commands displayed on the television and activated by an input device such as a keyboard or remote controller, would activate a menu for synchronized viewing on the PVR 114 a. User 1 would respond to and send the menu. Resulting other menus would be sent to user 2. The users would each indicate by their respective response to the menus they received whether or not they will be participating in the session. Based on the responses, a synchronized viewing session is established to begin at an agreed upon time. The agreed upon time may be a universal time, such as 9:00 P.M., or a relative time, such as in 5 minutes. A series of menus for establishing a viewing session are discussed in U.S. patent application Ser. No. 09/894,060, described above. A memory device and a processor preferably reside in either the PVRs 114 a, b or one of the other devices associated with system 110. Programming code associated with the system 110 preferably resides in the memory device and is processed by the processor.” <i>Id.</i> at 7:4-24.</p> <p>“FIG. 2 provides a more detailed look at an exemplary PVR 114 a in accordance with the present invention. Although the initiator PVR is shown, and, hence, the suffix ‘a’ is used, any participant PVR would generally have the same architecture, because the role of initiator is handed off during a session to the latest PVR performing a control function. The PVR 114 a includes a receiver 113 a, and a video processing unit 201 comprised of a microprocessor 202, a remote control sensor 204, and a digital memory 206. The microprocessor 202 includes an image or video player 208, a stream characteristics unit 210, a video timer 212 and a period timer 213. The digital memory 206 includes a synchronization register 214, a signature processing workspace 216 a video block 218, a status buffer 220 and miscellaneous storage 222. The remote control sensor 204 receives a signal from the remote control 116 a, operated by a user or viewer</p>

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<p>of the television 122 a, and conveys a corresponding signal to the microprocessor 202. The microprocessor 202 reads from and writes to the digital memory 206.” <i>Id.</i> at 7:51-8:3.</p> <p>To the extent that Janevski is found not to disclose this feature, it would have been obvious based on the disclosures of Janevski alone or in combination with the disclosures of one or more of the references cited for this limitation in Exhibits 953-01 through 953-09 or Exhibit 953-B for the reasons discussed herein and in Defendant’s cover pleading.</p>
<p>7[f] receiving a request to enter into a synchrony group with at least a second zone player that is communicatively coupled with the first zone player over a local area network (LAN);</p>
<p>Janevski discloses this feature. For example, Janevski discloses a first zone player (e.g., PVR 114b) receiving a direction (from its user) to enter into a “synchronized viewing session” with a second zone player (e.g., PVR 114a), upon which it transmits the request to the second zone player. <i>See, e.g.</i>, the following:</p> <p>“First, to join a currently active synchronized viewing session, a user of a potential participant PVR 114 b solicits, via the telephone 124 or menu screens, the consent of the users of current participant PVRs 114 a, b and then signs on via a menu screen. If the users of the current participant PVRs 114 a, b approve, the potential participant PVR 114 b becomes a new participant PVR 114 b, to be synchronized with the initiator PVR 114 a.” <i>Id.</i> at 11:4-11.</p> <p>“As seen in the ongoing session join process of FIG. 6, the new participant PVR 114 b notifies the initiator PVR 114 a that it is joining the current session (step S602). The initiator PVR 114 a, in response, sends an originating synchronization message 402 to the new participant PVR 114 b (step S604). Upon receipt, the new participant PVR 114 b advances the time count of its video timer 212 so that the value of the time count matches time stamp A contained in the message 402, and, correspondingly, fast forwards its copy of video 308 (step S606). The point in the playback fast forwarded to corresponds to the value of the advanced time count, so that the new participant's playback has caught up content-wise with the playback of the initiator. The new participant PVR 114 b then transmits to the initiator PVR 114 a a join request message (step S608), to proceed with a fine tuning of its synchronization with the initiator PVR 114 a by means of time synchronization followed by frame synchronization. FIGS. 7A and 7B are flowchart depictions of an example of time synchronization according to the present invention. In the current example, there are five possible triggering events for the synchronization process: (1) start of a session, (2) the initiator's period timer 213 expires, (3) the initiation of a control function, (4) a retry request message is received, or (5) a join request message is received (step S701). The initiator's period timer 213 counts the time interval until the initiator will again synchronize the session participants. A retry request message is issued by a participant to the initiator when an attempted frame synchronization has been unsuccessful, and requests that synchronization with the participant be retried after a predetermined period of time.” <i>Id.</i> at 11:12-42.</p>

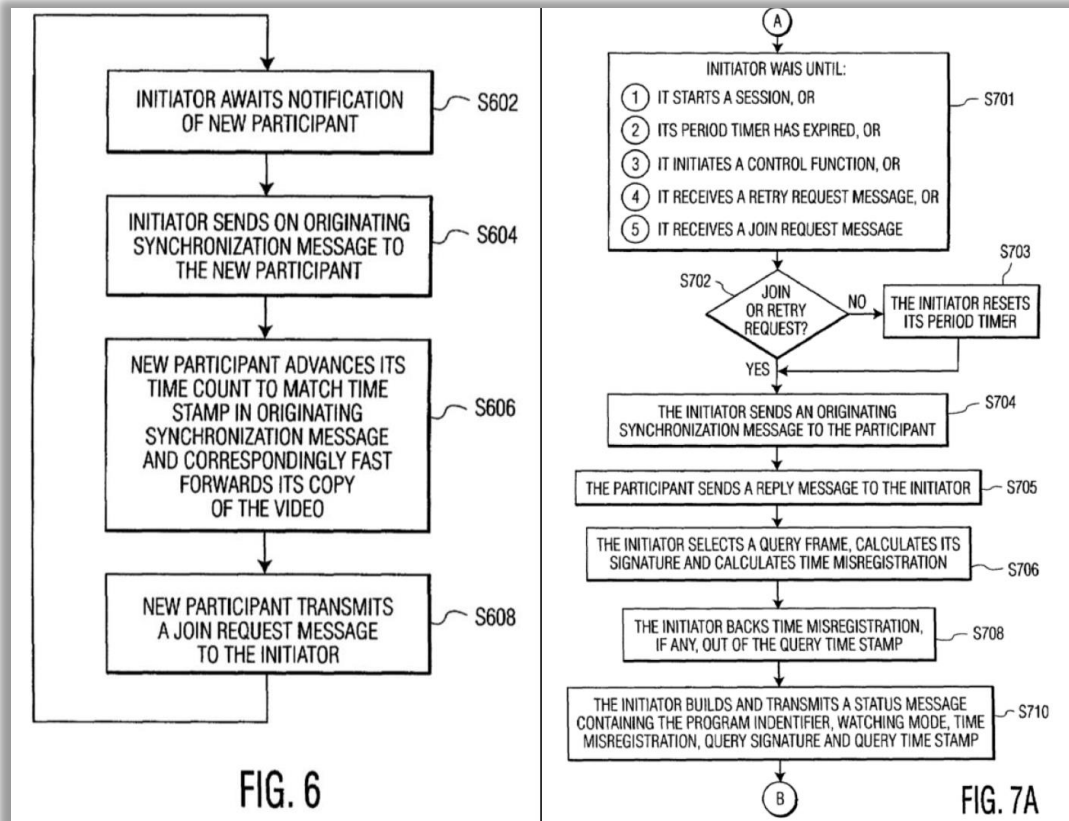
Exemplary Disclosures
<p>“The system 110 preferably has two communication networks associated therewith. The first is an Internet network 118 that interconnects the PVRs 114 a, b located at the two different locations (e.g. House 1 and House 2). The Internet network 118 supplies the means 119 for communicating information between the PVRs 114 a, b such that synchronization may be achieved. The second communication network is a telephone network 120, e.g., public switched telephone network (PSTN) or a private network, which provides a communication means for the two users to communicate while they are simultaneously viewing the recorded program 112 a, b. Alternatively, either or both of the two communications networks may comprise Internet and/or telephone components.” <i>Id.</i> at 6:45-58.</p> <p>To the extent that Janevski is found not to disclose this feature, it would have been obvious based on the disclosures of Janevski alone or in combination with the disclosures of one or more of the references cited for this limitation in Exhibits 953-01 through 953-09 or Exhibit 953-B for the reasons discussed herein and in Defendant’s cover pleading.</p>
<p>7[g] in response to receiving the request to enter into the synchrony group, entering into the synchrony group with the second zone player, wherein the first zone player is selected to begin operating as a slave of the synchrony group and the second zone player is selected to begin operating as a master of the synchrony group, and wherein the clock time of the first zone player differs from a clock time of the second zone player;</p>
<p>Janevski discloses this feature. For example, Janevski discloses upon receiving a user’s command, the first zone player (PVR 114b) enters into the synchrony group with the second zone player (PVR 114a). In this example, PVR 114b and PVR 114a begin to operate as a slave and master, respectively, of the synchrony group. <i>See, e.g.</i>, the following:</p> <p>“Assuming that user 1 takes the lead as the ‘initiator’, user 1, via a remote control 116, via controls on the PVR 114 a itself, or via control commands displayed on the television and activated by an input device such as a keyboard or remote controller, would activate a menu for synchronized viewing on the PVR 114 a. User 1 would respond to and send the menu. Resulting other menus would be sent to user 2. The users would each indicate by their respective response to the menus they received whether or not they will be participating in the session. Based on the responses, a synchronized viewing session is established to begin at an agreed upon time. The agreed upon time may be a universal time, such as 9:00 P.M., or a relative time, such as in 5 minutes. A series of menus for establishing a viewing session are discussed in U.S. patent application Ser. No. 09/894,060, described above. A memory device and a processor preferably reside in either the PVRs 114 a, b or one of the other devices associated with system 110. Programming code associated with the system 110 preferably resides in the memory device and is processed by the processor.” <i>Id.</i> at 7:4-24.</p> <p>“First, to join a currently active synchronized viewing session, a user of a potential participant PVR 114 b solicits, via the telephone 124 or menu screens, the consent of the users of current participant PVRs 114 a, b and then signs on via a menu screen. If the users of the current</p>

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participant PVRs 114 a, b approve, the potential participant PVR 114 b becomes a new participant PVR 114 b, to be synchronized with the initiator PVR 114 a.” *Id.* at 11:4-11.

“As seen in the ongoing session join process of FIG. 6, the new participant PVR 114 b notifies the initiator PVR 114 a that it is joining the current session (step S602). The initiator PVR 114 a, in response, sends an originating synchronization message 402 to the new participant PVR 114 b (step S604). Upon receipt, the new participant PVR 114 b advances the time count of its video timer 212 so that the value of the time count matches time stamp A contained in the message 402, and, correspondingly, fast forwards its copy of video 308 (step S606). The point in the playback fast forwarded to corresponds to the value of the advanced time count, so that the new participant's playback has caught up content-wise with the playback of the initiator. The new participant PVR 114 b then transmits to the initiator PVR 114 a a [sic] join request message (step S608), to proceed with a fine tuning of its synchronization with the initiator PVR 114 a by means of time synchronization followed by frame synchronization. FIGS. 7A and 7B are flowchart depictions of an example of time synchronization according to the present invention. In the current example, there are five possible triggering events for the synchronization process: (1) start of a session, (2) the initiator's period timer 213 expires, (3) the initiation of a control function, (4) a retry request message is received, or (5) a join request message is received (step S701). The initiator's period timer 213 counts the time interval until the initiator will again synchronize the session participants. A retry request message is issued by a participant to the initiator when an attempted frame synchronization has been unsuccessful, and requests that synchronization with the participant be retried after a predetermined period of time.” *Id.* at 11:12-42.

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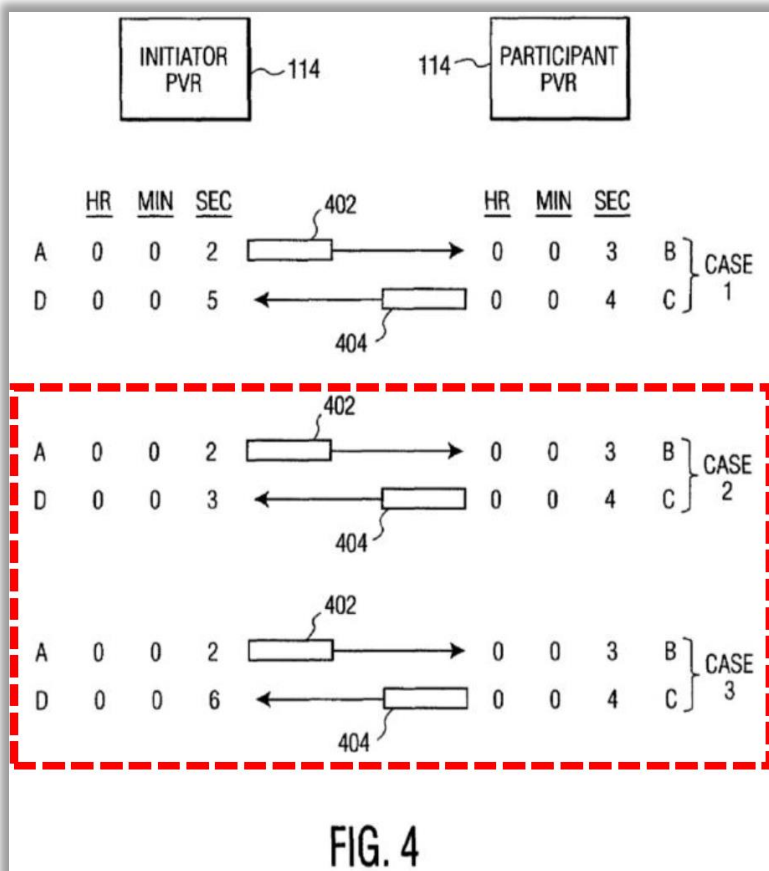
Id. at Figs. 6 & 7A.

“In operation, a potential viewer of the video 308, arranges for a particular video start time with other potential viewers by means of, for example, the telephone 124 a or by using the remote control 116 a to navigate and complete a menu that has appeared on the television 122 a. Menu templates could reside, for example, in miscellaneous storage 222. The potential viewer, acting as the initiator of a synchronized viewing session, then, by means of an initiation menu, schedules the session to start at the video start time. Each session participant's video timer 212 starts at, for example, 0 hours, 0 minutes and 0 seconds, to play its respective local copy of the video 308. Each local copy of the video 308 is essentially the same; although, they may differ, for example, compression techniques and parameters used, as to exact control function speeds and as to the exact starting point in the video program.” *Id.* at 15:6-21.

Janevski further discloses that the clock time of the first zone player (e.g., provided by the video timer 212 of PVR 114b) differs from the clock time of the second zone player (e.g., provided by the video timer 212 of PVR 114a). Janevski also discloses a formula used to compensate for the difference in the clock time, which Janevski refers to as “time misregistration.”

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“The time misregistration, TM, between the respective video timers 212 of the initiator and participant PVRs 114 a, b is given by the formula: $TM = \frac{1}{2}[(A+D)-(C+B)]$ (1)” *Id.* at 9:30-34.



Id. at Fig. 4 (annotated).

“In CASE 2, an originating synchronization message 402 is sent from the initiator to the participant PVR 114 b, and a reply synchronization message 404 is sent from the participant to the initiator PVR 114 a. The time misregistration in CASE 2 is $\frac{1}{2}[(2+3)-(4+3)] = -1$ second. Here, the initiator's video timer 212 lags the participant's timer 212, the transmission time is negligible and the timing difference is almost totally due to misregistration between the two video timers 212. The magnitude of the time misregistration is one second. The sign of the time misregistration indicates whether the initiator lags the participant, or vice versa. If the sign is negative, as in the current case, the initiator lags the participant; if the sign is positive, the participant lags the initiator.” *Id.* at 9:40-53.

“In CASE 3, an originating synchronization message 402 is sent from the originating to the participant PVR 114 b, and a reply synchronization message 404 is sent from the participant PVR 114 b to the initiator PVR 114 a. The time misregistration is CASE 3 is $\frac{1}{2}[(2+6)-(4+3)] = \frac{1}{2}$

Exhibit 953-01: Janevski

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<p>second; in effect, the transmission time is $1\frac{1}{2}$ second and the participant lags the initiator by $\frac{1}{2}$ second. That is, the message 402 arrived at the participant PVR 114 b when the video timer 212 of the initiator PVR 114 a read $3\frac{1}{2}$ seconds, and, at the same time, the video timer 212 of the participant PVR 114 b read 3 seconds, this $3\frac{1}{2}-3=\frac{1}{2}$ second difference representing the $\frac{1}{2}$ second time misregistration magnitude. Accordingly, one second later, when the timer 212 of the initiator PVR 114 a reads $4\frac{1}{2}$ seconds, the participant sends the reply message 404, which arrives, after a transmission time of $1\frac{1}{2}$ seconds, when the timer 212 of the initiator PVR 114 a reads 6 seconds.” <i>Id.</i> at 9:54-10:3.</p> <p>“Next, the microprocessor 202 of the initiator's PVR 114 a checks its video timer 212, places its time count as time stamp A into field 510 of the originating synchronization message 402, and transmits the message 402 (step S704). The microprocessor 202 of the participant's PVR 114 b checks its video timer 212 upon receipt of message 402 and saves the time count as time stamp B in field 520 of the message 402. The participant's PVR 114 b further augments the originating synchronization message 402, and thereby transforms the originating synchronization message 402 into the reply synchronization message 404, by creating field 530 and placing time stamp C from the participant's video timer 212 into field 530 of message 402. The participant's PVR 114 b then immediately transmits the reply message 404 to the initiator's PVR 114 a (step S705). Upon receipt of reply message 404, the initiator's microprocessor 202 checks its video timer 212 for the time of receipt, time D, and uses it, together with the time stamps in the fields of the message 404, to determine the time misregistration 540, TM, based on formula (1).” <i>Id.</i> at 11:52-12:4.</p> <p>To the extent that Janevski is found not to disclose this feature, it would have been obvious based on the disclosures of Janevski alone or in combination with the disclosures of one or more of the references cited for this limitation in Exhibits 953-01 through 953-09 or Exhibit 953-B for the reasons discussed herein and in Defendant’s cover pleading.</p>
7[h] after beginning to operate as the slave of the synchrony group:
<p>Janevski discloses this feature. For example, Janevski discloses that after beginning to operate as a slave of the synchrony group, the first zone player (e.g., PVR 114b) performs the steps described below. <i>See</i> claims 7[i] – 7[m], <i>infra</i>.</p> <p>To the extent that Janevski is found not to disclose this feature, it would have been obvious based on the disclosures of Janevski alone or in combination with the disclosures of one or more of the references cited for this limitation in Exhibits 953-01 through 953-09 or Exhibit 953-B for the reasons discussed herein and in Defendant’s cover pleading.</p>
7[i] receiving, from the second zone player over the LAN, clock timing information that comprises at least one reading of the clock time of the second zone player;

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Janevski discloses this feature. For example, Janevski discloses that the first zone player (e.g., PVR 114b) receives from the second zone player (e.g., PVR 114a) a message 402 containing Time Stamp A 510. Time Stamp A 510 corresponds to a clock time of the second zone player as read by its microprocessor at time A and thus constitutes “clock timing information.” *See, e.g.*, the following:

“FIG. 5 illustrates an example of message formats utilized in the present invention to perform time synchronization. Referring back to any of Cases 1, 2 or 3 in FIG. 4, the originating message 402, at the time it is transmitted by the initiator PVR 114 a, has a field 510 containing time stamp A (corresponding to time A in FIG. 4), as shown in the first format in FIG. 4. Upon arrival at the participant PVR 114 b, a field 520 containing time stamp B is added to the originating message 402, as shown in the second format. Just prior to sending the reply message 404 back to the initiator PVR 114 a, the participant PVR 114 b also adds a field 530 containing time stamp C, as shown in the third format, to convert the originating message 402 to the reply message 404. The initiator PVR 114 a receives the reply message 404 at time D (as in FIG. 4), calculates the time misregistration, TM, based on formula (1), and places the calculated time misregistration 540 into a status message 550, into which it also inserts a program identifier 560, watching mode 570, a query signature 580 and a query time stamp 590. The program identifier 560 identifies the video 308 that is currently playing. The watching mode 570 is control information for controlling processing of the PVRs 114 a, b and denotes the state of the PVRs 114 a, b, as discussed further below.” *Id.* at 10:4-19.

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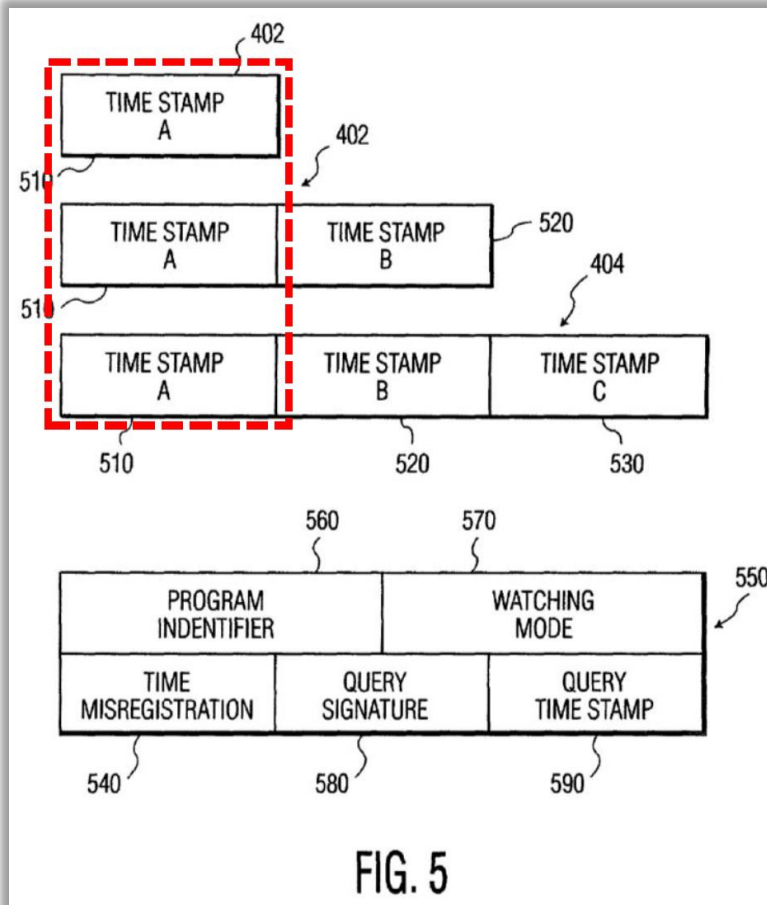


FIG. 5

Id. at Fig. 5 (annotated).

“Next, the microprocessor 202 of the initiator's PVR 114 a checks its video timer 212, places its time count as time stamp A into field 510 of the originating synchronization message 402, and transmits the message 402 (step S704). The microprocessor 202 of the participant's PVR 114 b checks its video timer 212 upon receipt of message 402 and saves the time count as time stamp B in field 520 of the message 402. The participant's PVR 114 b further augments the originating synchronization message 402, and thereby transforms the originating synchronization message 402 into the reply synchronization message 404, by creating field 530 and placing time stamp C from the participant's video timer 212 into field 530 of message 402. The participant's PVR 114 b then immediately transmits the reply message 404 to the initiator's PVR 114 a (step S705). Upon receipt of reply message 404, the initiator's microprocessor 202 checks its video timer 212 for the time of receipt, time D, and uses it, together with the time stamps in the fields of the message 404, to determine the time misregistration 540, TM, based on formula (1).” *Id.* at 11:53-12:4.

Exhibit 953-01: Janevski

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<p>Janevski discloses that the first zone player receives the clock timing information from the second zone player “over the LAN.” <i>See</i> claim 7[f], <i>supra</i>.</p> <p>To the extent that Janevski is found not to disclose this feature, it would have been obvious based on the disclosures of Janevski alone or in combination with the disclosures of one or more of the references cited for this limitation in Exhibits 953-01 through 953-09 or Exhibit 953-B for the reasons discussed herein and in Defendant’s cover pleading.</p>
<p>7[j] based on the received clock timing information, determining a differential between the clock time of the first zone player and the clock time of the second zone player;</p>
<p>Janevski discloses this feature. For example, Janevski discloses determining a differential between the clock times of the first and second zone players (e.g., PVR 114b and PVR 114a, respectively) based on the times stamps registered in the messages exchanged back and forth. <i>See</i> claims 7[g] and 7[i], <i>supra</i>. <i>See, e.g.</i>, the following:</p> <p>“Next, the microprocessor 202 of the initiator's PVR 114 a checks its video timer 212, places its time count as time stamp A into field 510 of the originating synchronization message 402, and transmits the message 402 (step S704). The microprocessor 202 of the participant's PVR 114 b checks its video timer 212 upon receipt of message 402 and saves the time count as time stamp B in field 520 of the message 402. The participant's PVR 114 b further augments the originating synchronization message 402, and thereby transforms the originating synchronization message 402 into the reply synchronization message 404, by creating field 530 and placing time stamp C from the participant's video timer 212 into field 530 of message 402. The participant's PVR 114 b then immediately transmits the reply message 404 to the initiator's PVR 114 a (step S705). Upon receipt of reply message 404, the initiator's microprocessor 202 checks its video timer 212 for the time of receipt, time D, and uses it, together with the time stamps in the fields of the message 404, to determine the time misregistration 540, TM, based on formula (1).” <i>Id.</i> at 11:53-12:4.</p> <p>“In an alternative embodiment, the initiator can share time compensation duties with the participants. Particularly, if the session includes, in addition to the initiator, only one participant, the initiator can fully assume time misregistration compensation, and eliminate the overhead of maintaining a time misregistration field 540 in the status message 550. Another option is for the initiator to assume only fast forwarding or only rewinding duties, and to delegate the other duties, i.e., fast forwarding or rewinding, to the participant. As a further enhancement, if the calculated time misregistration, TM, exceeds a predetermined threshold, the initiator and participant can bridge the gap synchronously, one rewinding and the other fast forwarding, to synchronize faster.” <i>Id.</i> at 13:8-21.</p> <p>“Moreover, the present invention, however, is not limited to any particular time synchronization method.” <i>Id.</i> at 13:22-23.</p>

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<p><i>See also</i> IPR2018-00766, Petition at 42, 45, 63.</p> <p>To the extent that Janevski is found not to disclose this feature, it would have been obvious based on the disclosures of Janevski alone or in combination with the disclosures of one or more of the references cited for this limitation in Exhibits 953-01 through 953-09 or Exhibit 953-B for the reasons discussed herein and in Defendant’s cover pleading.</p>
<p>7[k] receiving, from the second zone player over the LAN, (a) audio information for at least a first audio track and (b) playback timing information associated with the audio information for the first audio track that comprises an indicator of a first future time, relative to the clock time of the second zone player, at which the first and second zone players are to initiate synchronous playback of the audio information for the first audio track;</p>
<p>Janevski discloses this feature. For example, as discussed above with respect to claim 7[f], Janevski discloses communicatively coupling the first zone player and the second zone player “over the LAN.” And as discussed below, Janevski discloses a first zone player receiving the claimed “audio information” and “playback timing information” from the second zone player over the LAN. <i>See, e.g.</i>, the following:</p> <p>Janevski discloses that the first zone player (e.g., PVR 114b) may receive from the second zone player (e.g., PVR 114a) a status message that includes information about renderable content such as audio (<i>see</i> claim 7[pre], <i>supra</i>). For example, the status message includes program identifier 560 and a query signature 580. A program identifier “identifies the video [] that is currently playing,” and a query signature is “information characteristic of content of the digital bit stream from which the initiator plays back its own copy of the video [].” Janevski at 7:25-50, 10:4-35. As such, the program identifier and/or a query signature constitute the claimed “audio information” that the first zone player receives from the second zone player.</p> <p>“More than two users may participate in a synchronized viewing session; for example, users in three or more remote locations may arrange mutually by phone, by menus, by e-mail, by Internet chat, etc., to view a particular program simultaneously. During the session, viewers may drop out or be added to the session. When any session participant performs a control function (e.g., start, pause, rewind, fast forward), that participant's PVR 114 b broadcasts a command for that function that is immediately communicated and effected in the PVR 114 b of each participant, to keep the presentation synchronized. To ensure that the PVRs 114 a, b participating in a session remain synchronous, a status message is sent out periodically by the ‘initiator’, i.e., the PVR 114 a that initiated the session. The status message is also transmitted with each command that is broadcasted in response to a participant performing a control function. The status message includes an indication of the program being watched, 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 from which playback to the message sender is being generated. The characteristic information is used to ‘fine tune’ the synchronization by</p>

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zeroing in on similar content being viewed on the message recipients' PVR 114 b.” *Id.* at 7:25-50.

“FIG. 5 illustrates an example of message formats utilized in the present invention to perform time synchronization. Referring back to any of Cases 1, 2 or 3 in FIG. 4, the originating message 402, at the time it is transmitted by the initiator PVR 114 a, has a field 510 containing time stamp A (corresponding to time A in FIG. 4), as shown in the first format in FIG. 4. Upon arrival at the participant PVR 114 b, a field 520 containing time stamp B is added to the originating message 402, as shown in the second format. Just prior to sending the reply message 404 back to the initiator PVR 114 a, the participant PVR 114 b also adds a field 530 containing time stamp C, as shown in the third format, to convert the originating message 402 to the reply message 404. The initiator PVR 114 a receives the reply message 404 at time D (as in FIG. 4), calculates the time misregistration, TM, based on formula (1), and places the calculated time misregistration 540 into a status message 550, into which it also inserts a program identifier 560, watching mode 570, a query signature 580 and a query time stamp 590. The program identifier 560 identifies the video 308 that is currently playing. The watching mode 570 is control information for controlling processing of the PVRs 114 a, b and denotes the state of the PVRs 114 a, b, as discussed further below.” *Id.* at 10:4-27.

“The query signature 580 is information characteristic of content of the digital bit stream from which the initiator plays back its own copy of the video 308. That information is to be compared to signatures derived based on the participant's copy of the video 308, in order to fine tune the synchronization of the participant's playback of its copy of the video 308 with playback of the initiator's copy of the video 308.” *Id.* at 10:28-35.

Alternatively, Janevski discloses the first zone player receiving “audio data,” which also amounts to “audio information:”

“In one aspect, the present invention is directed to an apparatus for synchronizing presentation of renderable content of two digital bit streams that reside in respective storage media. Renderable content, as used herein, refers to content that is presentable in a form that a user can sense, e.g. visually or aurally. The apparatus includes a stream characteristic unit for deriving information characteristic of content of one of said streams and comparing the information to information characteristic of content of the other stream. Content of the one stream is played back by progressing forward in the one stream. The presentation is synchronized by modifying that progress based on the comparison.” *Id.* at 5:7-19.

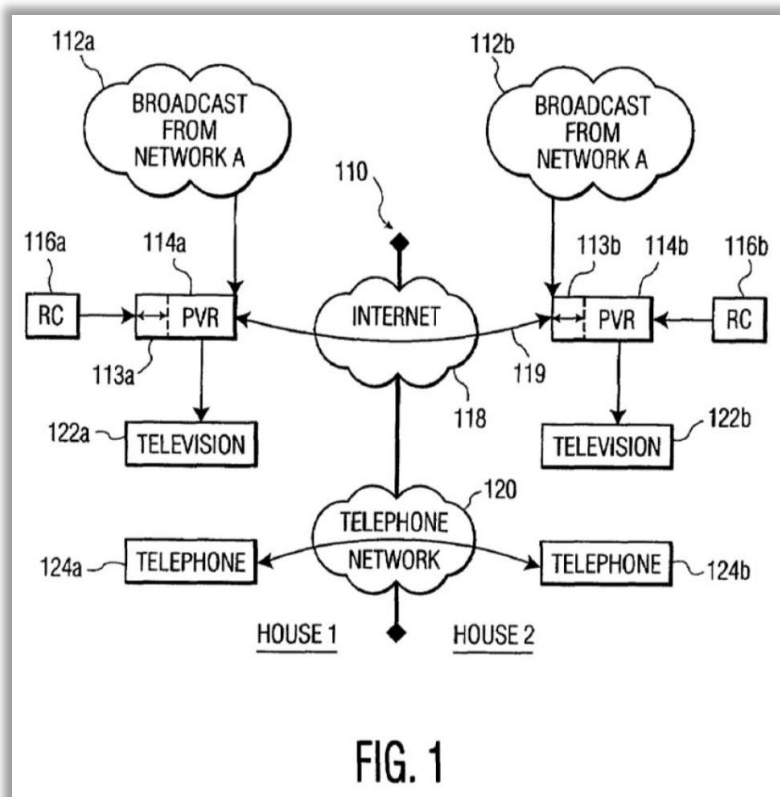
“This invention applies generally to synchronizing presentation of renderable content of two or more digital bit streams. The presentation may be merely visual or merely aural or both visual and aural. The bit streams need not contain both image and audio data. Thus, the characteristic information may be characteristic of viewable images or of audible sounds. Nor is it necessary that the characteristic information comprise signatures. For example, image and/or audio

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transform coefficients, as appropriate, can be used to characterize the content of the bit streams.” *Id.* at 16:34-43.

“Although the copies of video 308 are described as recorded from broadcasts, this is not a limitation. The video copies could be downloaded from a service provider or compact discs containing the video copies could be inserted into the respective PVRs. The video copies whose playback is being synchronized need not be remotely located, nor locally located at their respective PVRs.” *Id.* at 16:10-16.

“The system 110 preferably has two communication networks associated therewith. The first is an Internet network 118 that interconnects the PVRs 114 a, b located at the two different locations (e.g. House 1 and House 2). The Internet network 118 supplies the means 119 for communicating information between the PVRs 114 a, b such that synchronization may be achieved. The second communication network is a telephone network 120, e.g., public switched telephone network (PSTN) or a private network, which provides a communication means for the two users to communicate while they are simultaneously viewing the recorded program 112 a, b. Alternatively, either or both of the two communications networks may comprise Internet and/or telephone components.” *Id.* at 6:45-58.



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Id. at Fig. 1.

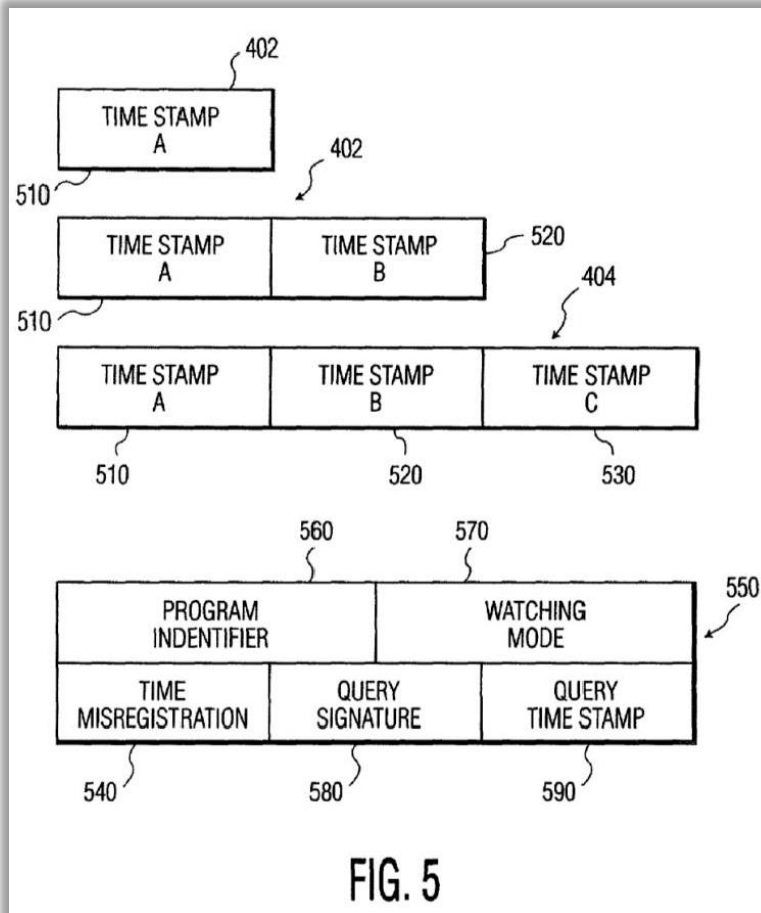
Janevski also discloses that a status message from the second zone player also includes an indication of the time into the program (e.g., query time stamp 590) that, from the perspective of the second zone player's clock time, indicates when to initiate synchronous playback by the first and second zone players. The query time stamp thus constitutes "playback timing information."

"More than two users may participate in a synchronized viewing session; for example, users in three or more remote locations may arrange mutually by phone, by menus, by e-mail, by Internet chat, etc., to view a particular program simultaneously. During the session, viewers may drop out or be added to the session. When any session participant performs a control function (e.g., start, pause, rewind, fast forward), that participant's PVR 114 b broadcasts a command for that function that is immediately communicated and effected in the PVR 114 b of each participant, to keep the presentation synchronized. To ensure that the PVRs 114 a, b participating in a session remain synchronous, a status message is sent out periodically by the "initiator", i.e., the PVR 114 a that initiated the session. The status message is also transmitted with each command that is broadcasted in response to a participant performing a control function. The status message includes an indication of the program being watched, 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 from which playback to the message sender is being generated. The characteristic information is used to "fine tune" the synchronization by zeroing in on similar content being viewed on the message recipients' PVR 114 b." *Id.* at 7:25-50.

"Copending U.S. patent application Ser. No. 09/894,060, entitled 'Synchronized Personal Video Recorders', filed Jun. 28, 2001, assigned to the assignee of the instant application, incorporated herein by reference, and not admitted to be prior art by its mention in the background section, discloses a system in which one PVR synchronizes with another PVR by sending out a status message to the other PVR. The message issues when the user of the initiator PVR operates a PVR function such as start up, fast forward or rewind, to allow the recipient of the message to perform the counterpart function to keep the presentation on both PVRs synchronized. The message is also transmitted periodically, to update the synchronization. Within the message is an identifier of the program being watched or to be watched, an indicator of the mode of watching (e.g. normal play, fast forward, pause, etc.), and the time or frame into the program. The time or frame allows the recipient PVR to synchronize its replay with that of the sending PVR, by comparing the time or frame in the message with its own the current time or frame." *Id.* at 1:53-2:5.

For instance, the status message includes a query time stamp associated with the audio information. *See id.* at 10:4-27 ("status message 550 includes a query time stamp 590"). The query time stamp indicates the time at which, relative to the clock time of the initiator, synchronous playback is to begin.

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Id. at Fig. 5.

“In step S803, the participant compares the query time stamp 590 to each time stamp in its synchronization register 214 to determine the closest time stamp. As an alternative to making comparison to each time stamp in the register 214, the comparisons can be terminated when the difference between the query time stamp and a time stamp in any comparison falls below a predetermined threshold, and is therefore deemed indicative of a match.” *Id.* at 14:1-9.

See also IPR2018-00766, Petition at 50, 60.

To the extent that Janevski is found not to disclose this feature, it would have been obvious based on the disclosures of Janevski alone or in combination with the disclosures of one or more of the references cited for this limitation in Exhibits 953-01 through 953-09 or Exhibit 953-B for the reasons discussed herein and in Defendant’s cover pleading.

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<p>7[l] updating the first future time to account for the determined differential between the clock time of the first zone player and the clock time of the second zone player; and</p>
<p>Janevski discloses this feature. For example, Janevski discloses that the participant compensates for the time misregistration (<i>see</i> claim 7[j], <i>supra</i>) by advancing or rolling back its timer, thereby updating the time at which playback is to begin. <i>See, e.g.</i>, the following:</p> <p>“In any event, if the program identifiers of the participant and initiator match, the participant's microprocessor 202 compensates for time misregistration, by advancing the time count of its video timer 212 by the magnitude of the time misregistration, if the time misregistration is positive, or by rolling back the time count of its video timer 212 by the magnitude of the time misregistration, if the time misregistration is negative (steps S722 through S728). (The advancing or rolling back of the time count is performed without executing any corresponding fast forward or rewind operation on the video 308 playing, these latter function being attended to instead during a subsequent frame compensation.) Time misregistration compensation (or ‘time compensation’), if any, is preferably carried out, by the participant, concurrent with the change, if any, in watching mode the participant performs in response to the message 550.” <i>Id.</i> at 12:59-13:8.</p> <p>Janevski also discloses that the initiator updates the first future time to account for the differential between its clock time and a participant's clock time:</p> <p>“The initiator's microprocessor 202 subtracts the time misregistration, TM, from the query time stamp 590 to back the calculated time misregistration 540, if any, out of the query time stamp 590 (step S708), which is the time stamp in the synchronization register entry that resides along the pointer to the query frame. Backing out the time misregistration 540, normalizes placement and the size of the range in which a search is conducted for the participant frame that content-wise most resembles the query frame. Thus, although the time misregistration 540 is added to the time count (step S714), it is subtracted from the query time stamp 590.” <i>Id.</i> at 12:18-29.</p> <p>As discussed with respect to claim 7[j], <i>supra</i>, according to Janevski, the determination can be performed by either a participant (“first zone player”) or the initiator (“second zone player”). <i>See id.</i> at 13:8-21.</p> <p>To the extent that Janevski is found not to disclose this feature, it would have been obvious based on the disclosures of Janevski alone or in combination with the disclosures of one or more of the references cited for this limitation in Exhibits 953-01 through 953-09 or Exhibit 953-B for the reasons discussed herein and in Defendant's cover pleading.</p>
<p>7[m] when the clock time of the first zone player reaches the updated first future time, initiating synchronous playback of the received audio information with the second zone player.</p>

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<p>Janevski discloses this feature. For example, Janevski discloses that when its timer reaches the updated time (<i>see</i> claim 7[1]), for example as a result of being advanced or rolled back, each participant begins synchronous playback of the received audio information with the initiator. <i>See, e.g.</i>, the following:</p> <p>“First, to join a currently active synchronized viewing session, a user of a potential participant PVR 114 b solicits, via the telephone 124 or menu screens, the consent of the users of current participant PVRs 114 a, b and then signs on via a menu screen. If the users of the current participant PVRs 114 a, b approve, the potential participant PVR 114 b becomes a new participant PVR 114 b, to be synchronized with the initiator PVR 114 a.” <i>Id.</i> at 11:4-11.</p> <p>“Upon receipt of the message 550, the participant's microprocessor 202 compares the program identifier 560 in the message to its own program identifier 560 in its status buffer 220 to assure that the participant's user is currently viewing the same video as is the initiator's user (step S712). If not (step S714), the participant's microprocessor retrieves an error message from the miscellaneous storage 222 and sends the message to the initiator (S716), because, in the synchronized viewing session, it is intended that all participants view the same program concurrently.” <i>Id.</i> at 12:37-47.</p> <p>“Time and frame synchronization is preferably performed periodically to keep the presentation synchronized. They are also preferably carried out with each function control command issued by a PVR 114 a as a result, for example, of interactive operation of input means to the PVR 114 a, b by a user viewing the presentation that changes the watching mode. In the latter case, the user's PVR 114 a, b becomes the new initiator PVR 114 a, with whom all participant PVRs 114 b maintain synchronization, until another participant PVR 114 b assumes the role of initiator PVR 114 a by broadcasting a command that other participant PVRs 114 b follow its control function. Accordingly, an initiator PVR 114 a that receives a command that changes the watching mode knows that it is no longer the initiator PVR 114 a, and a participant PVR 114 b that issues the command knows that it is now the initiator PVR 114 a.” <i>Id.</i> at 15:32-47.</p> <p>To the extent that Janevski is found not to disclose this feature, it would have been obvious based on the disclosures of Janevski alone or in combination with the disclosures of one or more of the references cited for this limitation in Exhibits 953-01 through 953-09 or Exhibit 953-B for the reasons discussed herein and in Defendant's cover pleading.</p>
<p>8. The first zone player of claim 7, wherein receiving the request to enter into the synchrony group with at least the second zone player comprises:</p> <p>receiving the request to enter into the synchrony group with at least the second zone player over the LAN from one or both of (a) a controller device that is communicatively coupled to the first zone player over the LAN and (b) the second zone player.</p>
<p>Janevski discloses this feature. <i>See, e.g.</i>, the following:</p>

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“Initially, the “initiator” is the PVR that starts the session, although that role is handed off to any PVR that, as directed by its user, performs a control function (e.g., stop, pause, fast forward, reverse). All other PVRs participating in the session are “participants”. Depending on context, the user of the initiator PVR is referred to as the “initiator”, and the user of a participant PVR is referred to as a “participant”. Since the broadcasts 112 a, b are received by the user, the user has the ability to record the broadcast 112 a, b in the PVR 114 a, b. The broadcast may be received in a receiver housed within a set-top box, DVD player, VHS player, personal computer, television, etc., and then routed to the PVR 114 a, b. The user has the ability to record a variety of different programs in the PVR 114 a, b along the bandwidth of the incoming broadcast signal. Additionally, since the broadcast signal is routed to each house separately, each house has the ability to separately turn the broadcast signal on or off.” *Id.* at 6:18-36.

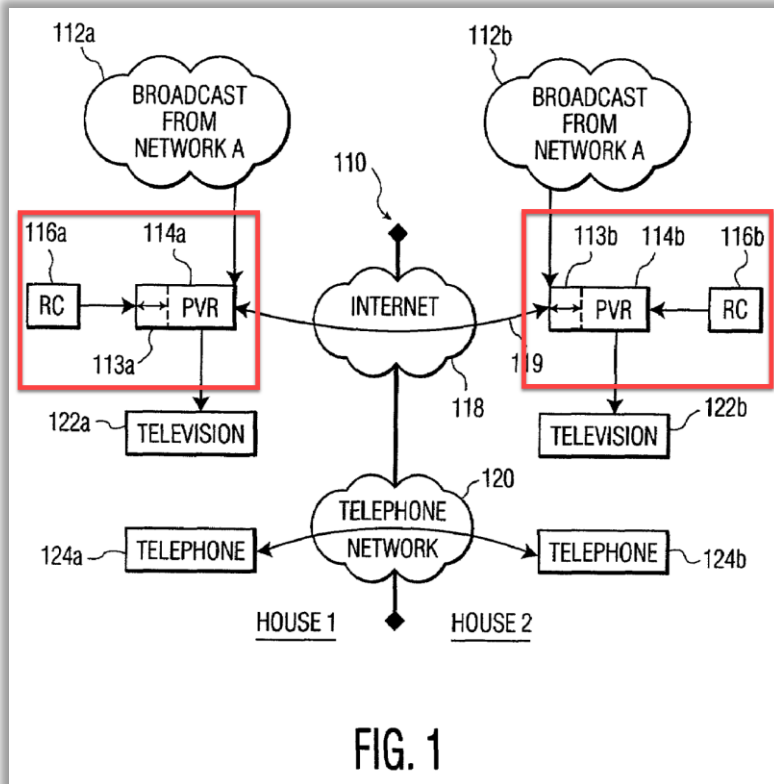
“A remote control 116 a, b is commonly associated with the personal video recorder 114 a, b to allow the user to operate the personal video recorder 114 a, b remotely. Typically, the remote control 116 a, b is configured to transmit an infrared signal to the television 122 a, b.” *Id.* at 6:40-44.

“Assuming that user 1 takes the lead as the “initiator”, user 1, via a remote control 116, via controls on the PVR 114 a itself, or via control commands displayed on the television and activated by an input device such as a keyboard or remote controller, would activate a menu for synchronized viewing on the PVR 114 a. User 1 would respond to and send the menu. Resulting other menus would be sent to user 2. The users would each indicate by their respective response to the menus they received whether or not they will be participating in the session. Based on the responses, a synchronized viewing session is established to begin at an agreed upon time.” *Id.* at 7:4-16.

“As mentioned above, the “initiator” may change during a session. Each time that a participant changes the watching mode i.e. executes a control function (rewind, fast forward, etc.), that participant broadcasts a command to all other participants (including the “current” initiator) and thereby becomes the new initiator.” *Id.* at 8:47-52.

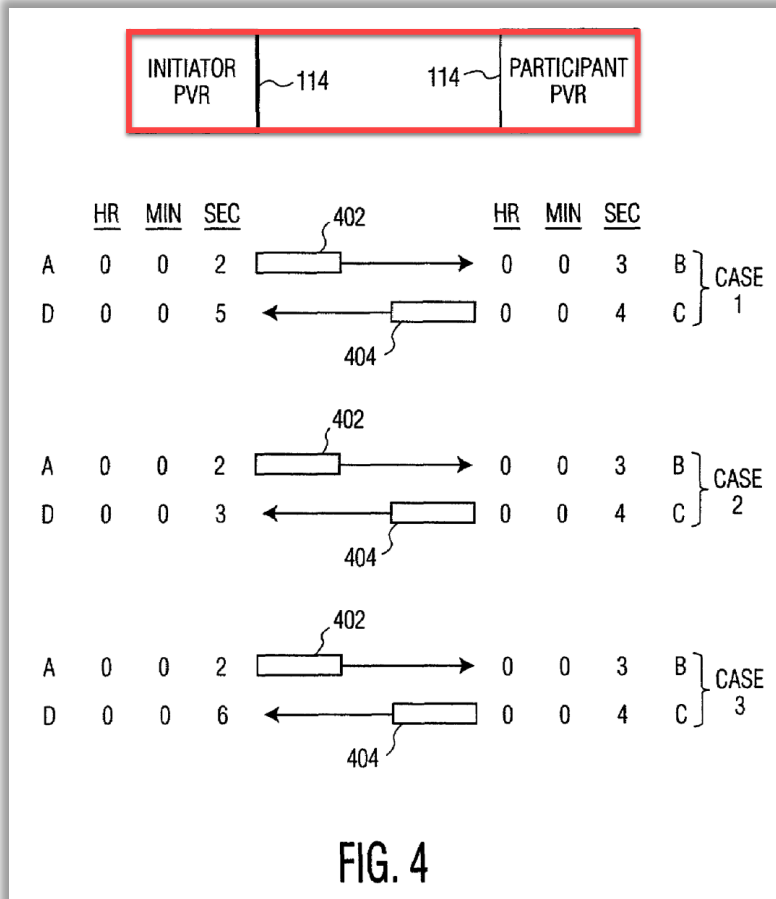
“First, to join a currently active synchronized viewing session, a user of a potential participant PVR 114 b solicits, via the telephone 124 or menu screens, the consent of the users of current participant PVRs 114 a, b and then signs on via a menu screen. If the users of the current participant PVRs 114 a, b approve, the potential participant PVR 114 b becomes a new participant PVR 114 b, to be synchronized with the initiator PVR 114 a.” *Id.* at 11:4-11.

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Id. at Fig. 1 (annotated).

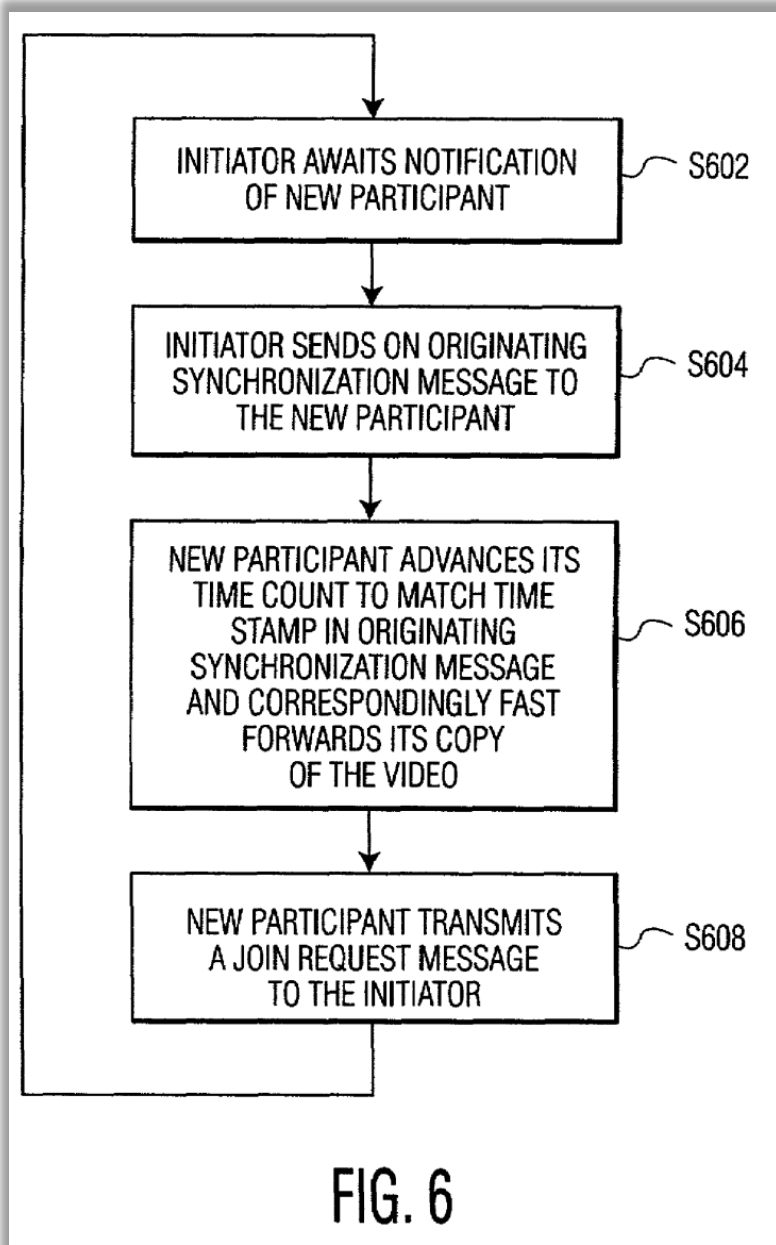
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Id. at Fig. 4 (annotated).

“As seen in the ongoing session join process of FIG. 6, the new participant PVR 114 b notifies the initiator PVR 114 a that it is joining the current session (step S602). The initiator PVR 114 a, in response, sends an originating synchronization message 402 to the new participant PVR 114 b (step S604). Upon receipt, the new participant PVR 114 b advances the time count of its video timer 212 so that the value of the time count matches time stamp A contained in the message 402, and, correspondingly, fast forwards its copy of video 308 (step S606).” *Id.* at 11:12-21.

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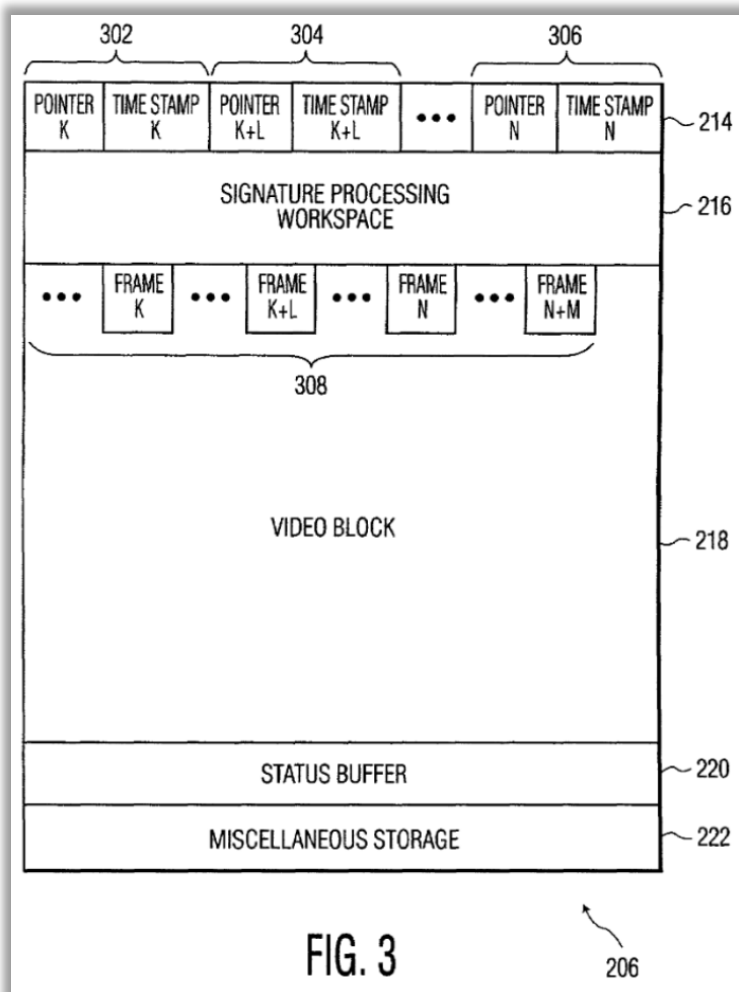
Id. at Fig. 6.

To the extent that Janevski is found not to disclose this feature, it would have been obvious based on the disclosures of Janevski alone or in combination with the disclosures of one or more of the references cited for this limitation in Exhibits 953-01 through 953-09 or Exhibit 953-B for the reasons discussed herein and in Defendant's cover pleading.

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<p>12. The first zone player of claim 7, wherein receiving the audio information for the first audio track from the second zone player over the LAN comprises:</p> <p>receiving a series of frames that each include a respective portion of the obtained audio information for the first audio track.</p>
<p>Janevski discloses this feature. <i>See, e.g.</i>, the following:</p> <p>As discussed with respect to claim 7[k], <i>supra</i>, the first zone player receives from the second zone player a status message over the LAN, which includes a “program identifier” and “query signature.” Alternatively, Janevski discloses the first zone player receiving “audio data,” which also amounts to “audio information.”</p> <p>The audio information is received in a series of frames. For example, the query signature, which is “information characteristic of content of the digital bit stream from which the initiator plays back its own copy of the video” (Janevski at 10:36-62), is received in a series of frames such that the query signature in each frame corresponds to a different portion (“I frame”) of the obtained audio information for the first audio track.</p> <p>“The present invention has a goal similar to that of Dimitrova, to compare characteristics of two video streams, except that the present invention uses the comparison to synchronize presentation of renderable content of the streams, whereas Dimitrova merely seeks a video clip similar to the query video clip. To adapt Dimitrova matching for the present invention, query frames are compared not against database frames, as in Dimitrova, but against frames in the participant's copy of the video, so that presentation of the video by the initiator and by the participant can, as a result, be made synchronous. Also, for the sake of processing speed, preferably a single query signature, corresponding primarily to a single frame, is transmitted to the participant for comparison, rather than transmitting all the signatures of a Dimitrova query video clip, which correspond primarily each to a separate frame. Accordingly, since a single query signature is compared, in each iteration, to a single candidate participant frame, the Hamming distance between the signatures of that pair of frames is calculated. The overhead of a “total Hamming distance” calculation is thereby avoided.” <i>Id.</i> at 4:48-67.</p> <p>“Thus, for instance, entry 302 consists of a pointer K to frame K, and a time stamp K corresponding to the time of playing of frame K. The entry 304 consists of a pointer K+L to the frame K+L, and a time stamp K+L corresponding to the time of playing of frame K+L. The dots between frames K and K+L indicate that there are intervening frames; yet, there are no corresponding entries in synchronization register 214. The reason for this lack of correspondence is that frames K and K+L are “I frames”, whereas none of the frames intervening between frames K and K+L are “I frames”.” <i>Id.</i> at 8:12-22.</p> <p>“All entries in the synchronization register 214 pertain to I frames, i.e., each pointer and associated time stamp relate to an I frame in the video 308. The entry 306 consists of a pointer N to the frame N, which is an I frame, and a time stamp N corresponding to the time of playing</p>

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of frame N. Each entry is created by left-shifting the synchronization register 214 by the entry length, which is uniform for all entries, and loading the entry into the register 214 from the right at the time the frame (i.e., I frame) referenced by the entry is playing. Presentation of the video 308 spans all the times corresponding to time stamps in entries that contain a pointer to a frame of the video 308.” *Id.* at 8:23-34.



Id. at Fig. 3.

“In the present invention, the signature to be compared to the query signature 580 (which is the signature of an I frame, since a query frame is an I frame) in the first iteration in the present invention is the signature of the I frame of the participant PVR 114 b whose time stamp is closest to the time stamp 590 of the query frame. That candidate participant frame (which is also an I frame, since all candidate participant frames are I frames) with the closest time stamp is the participant's first candidate frame. Subsequent candidate participant frames, each progressively further along in the participant's bit stream with each iteration, are compared one-by-one with

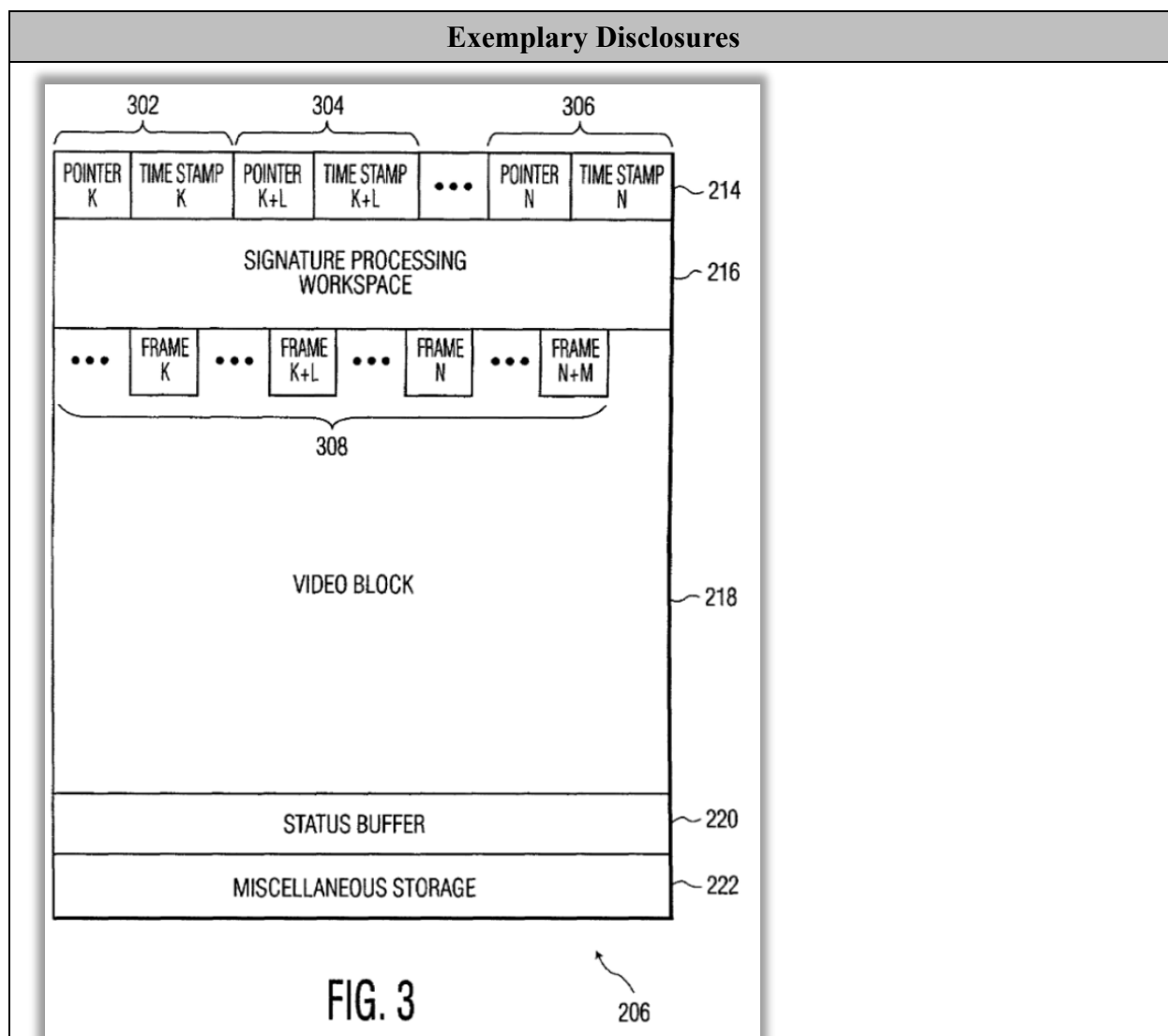
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<p>the query frame. For each candidate participant frame, there is a respective calculation of the Hamming distance between the signatures of the candidate participant frame and the query frame. Signatures in the present invention are calculated by techniques disclosed in Dimitrova. The minimum Hamming distance over all iterations is determined to identify the participant frame most similar content-wise to the query frame, and the cumulative shifts down the participant's video frame sequence to arrive at the identified frame correspond to an estimate of the "frame misregistration" between the initiator's playback and the participant's playback. "Frame misregistration" is used hereinafter to refer to the content-wise misalignment of two playbacks. When frame misregistration has been estimated, the participant then fast forwards or rewinds its copy of the video 308 to compensate for the frame misregistration." <i>Id.</i> at 10:36-62.</p> <p>"Copending U.S. patent application Ser. No. 09/894,060, entitled "Synchronized Personal Video Recorders", filed Jun. 28, 2001, assigned to the assignee of the instant application, incorporated herein by reference, and not admitted to be prior art by its mention in the background section, discloses a system in which one PVR synchronizes with another PVR by sending out a status message to the other PVR. The message issues when the user of the initiator PVR operates a PVR function such as start up, fast forward or rewind, to allow the recipient of the message to perform the counterpart function to keep the presentation on both PVRs synchronized. The message is also transmitted periodically, to update the synchronization. Within the message is an identifier of the program being watched or to be watched, an indicator of the mode of watching (e.g. normal play, fast forward, pause, etc.), and the time or frame into the program. The time or frame allows the recipient PVR to synchronize its replay with that of the sending PVR, by comparing the time or frame in the message with its own the current time or frame." <i>Id.</i> at 1:53-2:5.</p> <p><i>See also id.</i> at 13:24-15:31, Fig. 8.</p> <p>To the extent that Janevski is found not to disclose this feature, it would have been obvious based on the disclosures of Janevski alone or in combination with the disclosures of one or more of the references cited for this limitation in Exhibits 953-01 through 953-09 or Exhibit 953-B for the reasons discussed herein and in Defendant's cover pleading.</p>
<p>13. The first zone player of claim 12, wherein a first frame in the series of frames includes the indicator of the first future time.</p>
<p>Janevski discloses this feature. For example, Janevski discloses that a first frame (e.g., frame K+L) in the series of frames includes the indicator of the first future time (e.g., time stamp K+L in Fig. 3). <i>See, e.g.,</i> the following:</p> <p>"The present invention has a goal similar to that of Dimitrova, to compare characteristics of two video streams, except that the present invention uses the comparison to synchronize presentation of renderable content of the streams, whereas Dimitrova merely seeks a video clip similar to the query video clip. To adapt Dimitrova matching for the present invention, query frames are compared not against database frames, as in Dimitrova, but against frames in the participant's</p>

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copy of the video, so that presentation of the video by the initiator and by the participant can, as a result, be made synchronous. Also, for the sake of processing speed, preferably a single query signature, corresponding primarily to a single frame, is transmitted to the participant for comparison, rather than transmitting all the signatures of a Dimitrova query video clip, which correspond primarily each to a separate frame. Accordingly, since a single query signature is compared, in each iteration, to a single candidate participant frame, the Hamming distance between the signatures of that pair of frames is calculated. The overhead of a “total Hamming distance” calculation is thereby avoided.” *Id.* at 4:48-67.

“Thus, for instance, entry 302 consists of a pointer K to frame K, and a time stamp K corresponding to the time of playing of frame K. The entry 304 consists of a pointer K+L to the frame K+L, and a time stamp K+L corresponding to the time of playing of frame K+L. The dots between frames K and K+L indicate that there are intervening frames; yet, there are no corresponding entries in synchronization register 214. The reason for this lack of correspondence is that frames K and K+L are “I frames”, whereas none of the frames intervening between frames K and K+L are “I frames”.” *Id.* at 8:12-22.

“All entries in the synchronization register 214 pertain to I frames, i.e., each pointer and associated time stamp relate to an I frame in the video 308. The entry 306 consists of a pointer N to the frame N, which is an I frame, and a time stamp N corresponding to the time of playing of frame N. Each entry is created by left-shifting the synchronization register 214 by the entry length, which is uniform for all entries, and loading the entry into the register 214 from the right at the time the frame (i.e., I frame) referenced by the entry is playing. Presentation of the video 308 spans all the times corresponding to time stamps in entries that contain a pointer to a frame of the video 308.” *Id.* at 8:23-34.



Id. at Fig. 3.

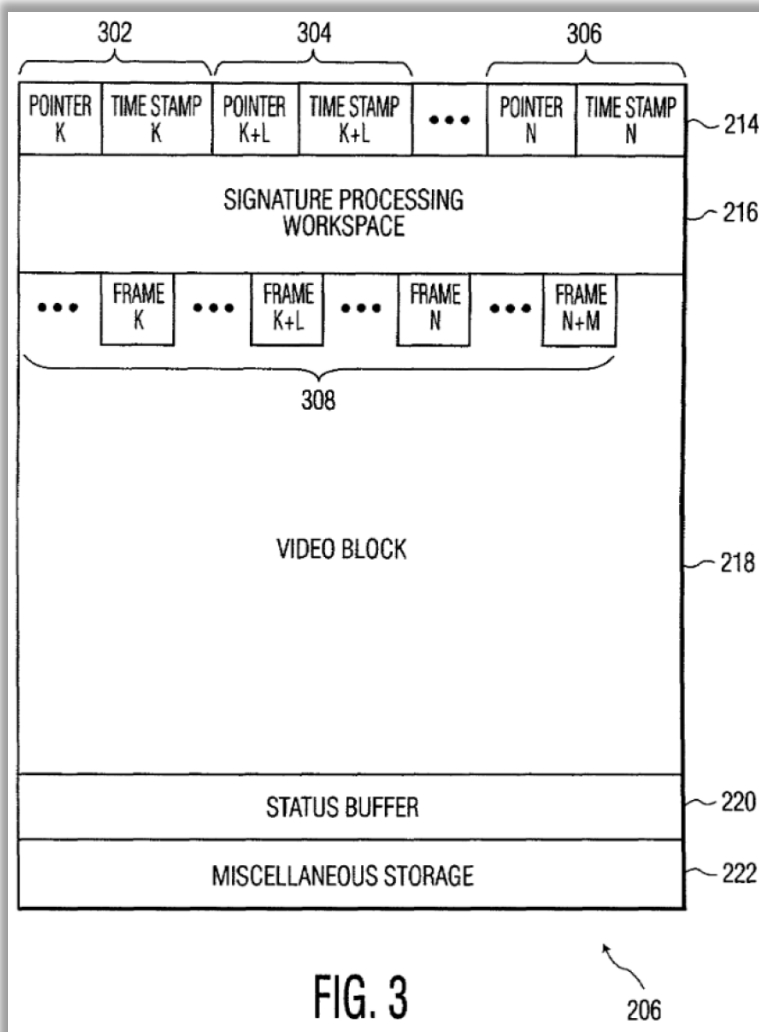
“In the present invention, the signature to be compared to the query signature 580 (which is the signature of an I frame, since a query frame is an I frame) in the first iteration in the present invention is the signature of the I frame of the participant PVR 114 b whose time stamp is closest to the time stamp 590 of the query frame. That candidate participant frame (which is also an I frame, since all candidate participant frames are I frames) with the closest time stamp is the participant's first candidate frame. Subsequent candidate participant frames, each progressively further along in the participant's bit stream with each iteration, are compared one-by-one with the query frame. For each candidate participant frame, there is a respective calculation of the Hamming distance between the signatures of the candidate participant frame and the query frame. Signatures in the present invention are calculated by techniques disclosed in Dimitrova. The minimum Hamming distance over all iterations is determined to identify the participant frame most similar content-wise to the query frame, and the cumulative shifts down the

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<p>participant's video frame sequence to arrive at the identified frame correspond to an estimate of the “frame misregistration” between the initiator's playback and the participant's playback. “Frame misregistration” is used hereinafter to refer to the content-wise misalignment of two playbacks. When frame misregistration has been estimated, the participant then fast forwards or rewinds its copy of the video 308 to compensate for the frame misregistration.” <i>Id.</i> at 10:36-62.</p> <p><i>See also id.</i> at 13:24-15:31, Fig. 8.</p> <p>To the extent that Janevski is found not to disclose this feature, it would have been obvious based on the disclosures of Janevski alone or in combination with the disclosures of one or more of the references cited for this limitation in Exhibits 953-01 through 953-09 or Exhibit 953-B for the reasons discussed herein and in Defendant’s cover pleading.</p>
<p>14. The first zone player of claim 13, wherein the playback timing information further comprises, for each subsequent frame in the series of frames:</p> <p>an indicator of a respective future time, relative to the clock time of the second zone player, at which the frame is to be synchronously played back by the first and second zone players.</p>
<p>Janevski discloses this feature. For example, Janevski discloses that the playback timing information further comprises, for each subsequent frame (e.g., frame $K+L+1$, ... , N, etc) in the series of frames: an indicator of a respective future time (e.g., time stamp $K+L+1$, N, etc), relative to the clock time of the second zone player, at which the frame is to be synchronously played back by the first and second zone players. <i>See, e.g.</i>, the following:</p> <p>“The present invention has a goal similar to that of Dimitrova, to compare characteristics of two video streams, except that the present invention uses the comparison to synchronize presentation of renderable content of the streams, whereas Dimitrova merely seeks a video clip similar to the query video clip. To adapt Dimitrova matching for the present invention, query frames are compared not against database frames, as in Dimitrova, but against frames in the participant's copy of the video, so that presentation of the video by the initiator and by the participant can, as a result, be made synchronous. Also, for the sake of processing speed, preferably a single query signature, corresponding primarily to a single frame, is transmitted to the participant for comparison, rather than transmitting all the signatures of a Dimitrova query video clip, which correspond primarily each to a separate frame. Accordingly, since a single query signature is compared, in each iteration, to a single candidate participant frame, the Hamming distance between the signatures of that pair of frames is calculated. The overhead of a “total Hamming distance” calculation is thereby avoided.” <i>Id.</i> at 4:48-67.</p> <p>“Thus, for instance, entry 302 consists of a pointer K to frame K, and a time stamp K corresponding to the time of playing of frame K. The entry 304 consists of a pointer $K+L$ to the frame $K+L$, and a time stamp $K+L$ corresponding to the time of playing of frame $K+L$. The dots between frames K and $K+L$ indicate that there are intervening frames; yet, there are no corresponding entries in synchronization register 214. The reason for this lack of</p>

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correspondence is that frames K and K+L are “I frames”, whereas none of the frames intervening between frames K and K+L are “I frames”.” *Id.* at 8:12-22.

“All entries in the synchronization register 214 pertain to I frames, i.e., each pointer and associated time stamp relate to an I frame in the video 308. The entry 306 consists of a pointer N to the frame N, which is an I frame, and a time stamp N corresponding to the time of playing of frame N. Each entry is created by left-shifting the synchronization register 214 by the entry length, which is uniform for all entries, and loading the entry into the register 214 from the right at the time the frame (i.e., I frame) referenced by the entry is playing. Presentation of the video 308 spans all the times corresponding to time stamps in entries that contain a pointer to a frame of the video 308.” *Id.* at 8:23-34.

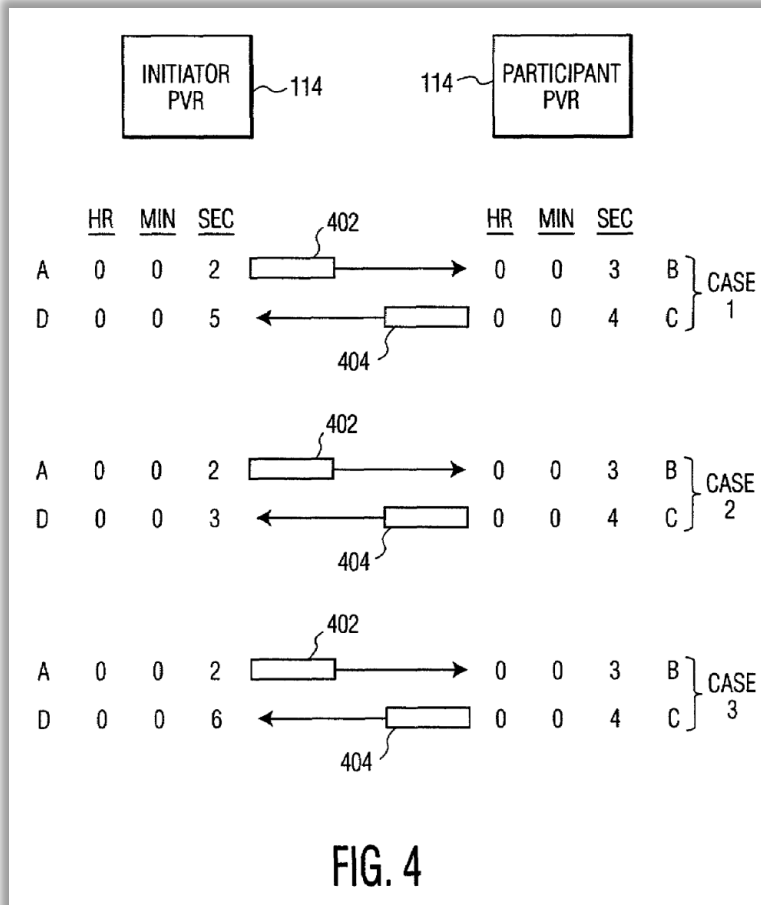


Id. at Fig. 3.

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<p>“In the present invention, the signature to be compared to the query signature 580 (which is the signature of an I frame, since a query frame is an I frame) in the first iteration in the present invention is the signature of the I frame of the participant PVR 114 b whose time stamp is closest to the time stamp 590 of the query frame. That candidate participant frame (which is also an I frame, since all candidate participant frames are I frames) with the closest time stamp is the participant's first candidate frame. Subsequent candidate participant frames, each progressively further along in the participant's bit stream with each iteration, are compared one-by-one with the query frame. For each candidate participant frame, there is a respective calculation of the Hamming distance between the signatures of the candidate participant frame and the query frame. Signatures in the present invention are calculated by techniques disclosed in Dimitrova. The minimum Hamming distance over all iterations is determined to identify the participant frame most similar content-wise to the query frame, and the cumulative shifts down the participant's video frame sequence to arrive at the identified frame correspond to an estimate of the “frame misregistration” between the initiator's playback and the participant's playback. “Frame misregistration” is used hereinafter to refer to the content-wise misalignment of two playbacks. When frame misregistration has been estimated, the participant then fast forwards or rewinds its copy of the video 308 to compensate for the frame misregistration.” <i>Id.</i> at 10:36-62.</p> <p><i>See also id.</i> at 13:24-15:31, Fig. 8.</p> <p>To the extent that Janevski is found not to disclose this feature, it would have been obvious based on the disclosures of Janevski alone or in combination with the disclosures of one or more of the references cited for this limitation in Exhibits 953-01 through 953-09 or Exhibit 953-B for the reasons discussed herein and in Defendant’s cover pleading.</p>
<p>18[a] The first zone player of claim 7, wherein the determined differential between the clock time of the first zone player and the clock time of the second zone player comprises an initial differential between the clock time of the first zone player and the clock time of the second zone player, and wherein the first zone player further comprises program instructions stored on the tangible, non-transitory computer-readable medium that are executable by the at least one processor to cause the first zone player to perform the following functions while operating as the slave of the synchrony group:</p>
<p>Janevski discloses this feature. For example, Janevski discloses an initial differential between the clock time of the first zone player and clock time of the second zone player (<i>see</i> claims 7(g) and 7(j), <i>supra</i>) and that the further functions described below are performed while the first zone player is operating as the slave of the synchrony group.</p> <p><i>See</i> claims 18(b) and 18(c), <i>infra</i>.</p> <p>To the extent that Janevski is found not to disclose this feature, it would have been obvious based on the disclosures of Janevski alone or in combination with the disclosures of one or more of</p>

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the references cited for this limitation in Exhibits 953-01 through 953-09 or Exhibit 953-B for the reasons discussed herein and in Defendant's cover pleading.
18[b] after determining the initial differential between the clock time of the first zone player and the clock time of the second zone player, receiving, from the second zone player over the LAN, updated clock timing information that includes at least one updated reading of the clock time of the second zone player; and
<p>Janevski discloses this feature. <i>See, e.g.</i>, the following:</p> <p>"If, for example, the destination PVR's video timer reads 1 hour, 1 minute and 1 second at a time when the destination PVR receives from the sending PVR a message having as its output time stamp 1 hour, 1 minute and 2 seconds (set according to the sending PVR's video timer), this might indicate the destination PVR's playback is one second behind that of the sending PVR. It might be the case, for example, that, according to the timing of a single reference clock, the destination PVR started its playback one second after the sending PVR started its playback. Based on that premise, the destination PVR can take corrective action to compensate for the one second time difference." <i>Id.</i> at 2:23-35.</p> <p>"Time synchronization can be implemented in many different known ways. Distributed processors (nodes) in a network can broadcast their respective clock values periodically to maintain synchronization. "Fault-Tolerant Clock Synchronization for Distributed Systems with High Message Delay Variation", Azevedo, Marcelo Moraes de, et. al., Irvine, Calif. (1995). Synchronization messages may be relayed between source and destination processors, where relaying nodes discard messages recognized as coming from a faulty node. "Communication Protocols for Fault-Tolerant Clock Synchronization in Not-Completely Connected Networks", Pfluegl, Manfred J. et. al., Irvine, Calif. (1992)." <i>Id.</i> at 8:53-64.</p> <p>"In the embodiment depicted herein, time synchronization is performed by the initiator PVR 114 a individually with each participant PVR 114 b, and involves sending an originating synchronization message 402 from the initiator PVR 114 a to a participant PVR 114 b and sending a reply synchronization message 404 from the participant PVR 114 b to the initiator PVR 114 a." <i>Id.</i> at 8:65-9:4.</p>

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Id. at Fig. 4.

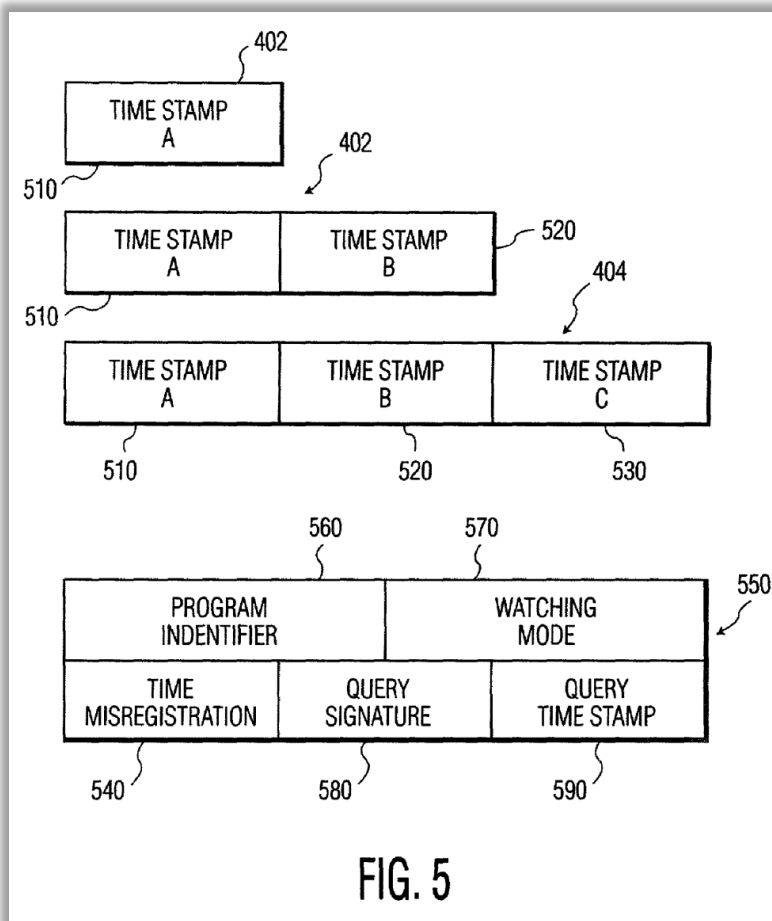
“In a first, exemplary case of timer or time synchronization, which is labeled in FIG. 4 as “CASE 1”, the initiator PVR 114 a sends an originating synchronization message 402 to the participant PVR 114 b. The message 402 is sent at a time A which is 0 hours, 0 minutes and 2 seconds according to the video timer 212 of the initiator PVR 114 a. The message 402 arrives at the participant PVR 114 b at a time B when the participant PVR 114 b video timer 212 reads 0 hours, 0 minutes and 3 seconds. The participant PVR 114 b sends back a reply synchronization message 404 at a time C when the participant PVR 114 b video timer 212 reads 0 hours, 0 minutes and 4 seconds. The message 404 is received by initiator PVR 114 a at a time D when the initiator PVR 114 a video timer 212 reads 0 hours, 0 minutes and 5 seconds.” *Id.* at 9:15-30.

“In CASE 2, an originating synchronization message 402 is sent from the initiator to the participant PVR 114 b, and a reply synchronization message 404 is sent from the participant to the initiator PVR 114 a. The time misregistration in CASE 2 is $\frac{1}{2}[(2+3)-(4+3)]=-1$ second. Here, the initiator's video timer 212 lags the participant's timer 212, the transmission time is negligible and the timing difference is almost totally due to misregistration between the two

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video timers 212. The magnitude of the time misregistration is one second. The sign of the time misregistration indicates whether the initiator lags the participant, or vice versa. If the sign is negative, as in the current case, the initiator lags the participant; if the sign is positive, the participant lags the initiator.” *Id.* at 9:40-53.

“In CASE 3, an originating synchronization message 402 is sent from the originating to the participant PVR 114 b, and a reply synchronization message 404 is sent from the participant PVR 114 b to the initiator PVR 114 a. The time misregistration is CASE 3 is $\frac{1}{2}[(2+6)-(4+3)]=\frac{1}{2}$ second; in effect, the transmission time is $1\frac{1}{2}$ second and the participant lags the initiator by $\frac{1}{2}$ second. That is, the message 402 arrived at the participant PVR 114 b when the video timer 212 of the initiator PVR 114 a read $3\frac{1}{2}$ seconds, and, at the same time, the video timer 212 of the participant PVR 114 b read 3 seconds, this $3\frac{1}{2}-3=\frac{1}{2}$ second difference representing the $\frac{1}{2}$ second time misregistration magnitude. Accordingly, one second later, when the timer 212 of the initiator PVR 114 a reads $4\frac{1}{2}$ seconds, the participant sends the reply message 404, which arrives, after a transmission time of $1\frac{1}{2}$ seconds, when the timer 212 of the initiator PVR 114 a reads 6 seconds.” *Id.* at 9:54-10:3.



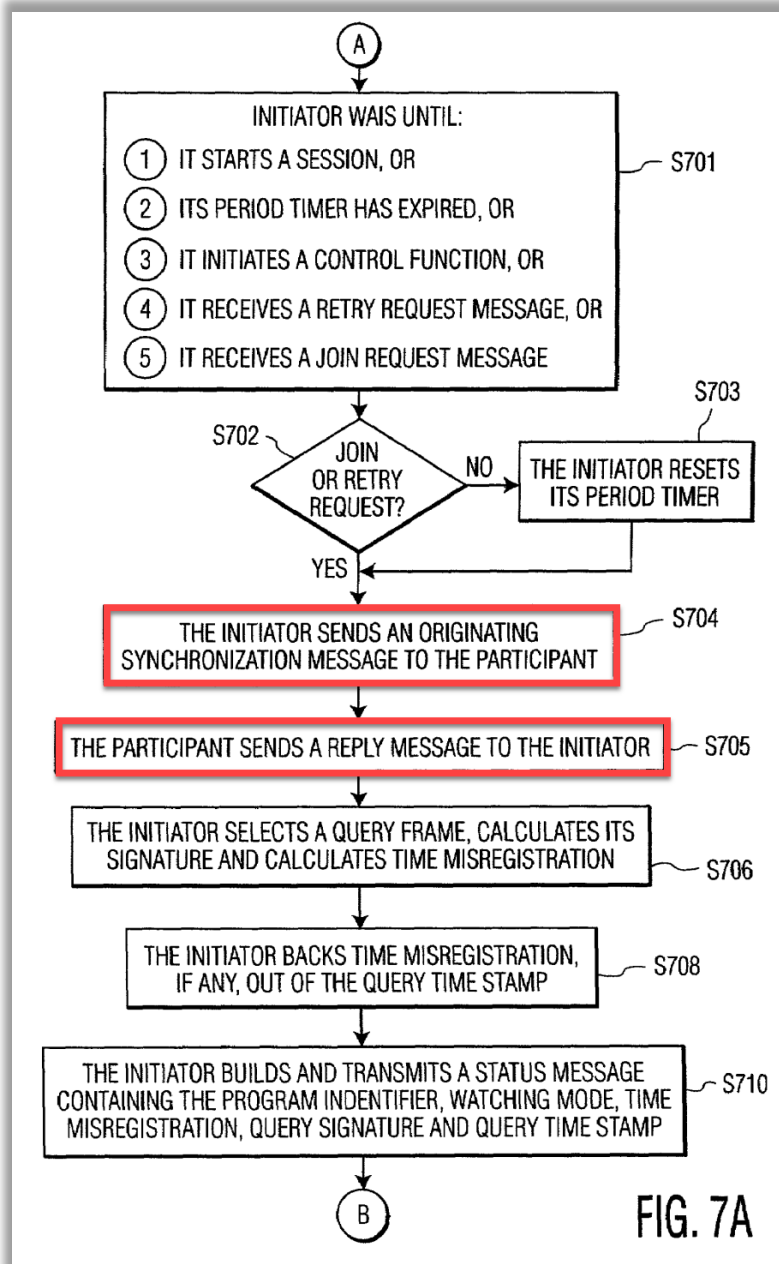
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Id. at Fig. 5.

“FIG. 5 illustrates an example of message formats utilized in the present invention to perform time synchronization. Referring back to any of Cases 1, 2 or 3 in FIG. 4, the originating message 402, at the time it is transmitted by the initiator PVR 114 a, has a field 510 containing time stamp A (corresponding to time A in FIG. 4), as shown in the first format in FIG. 4. Upon arrival at the participant PVR 114 b, a field 520 containing time stamp B is added to the originating message 402, as shown in the second format. Just prior to sending the reply message 404 back to the initiator PVR 114 a, the participant PVR 114 b also adds a field 530 containing time stamp C, as shown in the third format, to convert the originating message 402 to the reply message 404. The initiator PVR 114 a receives the reply message 404 at time D (as in FIG. 4), calculates the time misregistration, TM, based on formula (1), and places the calculated time misregistration 540 into a status message 550, into which it also inserts a program identifier 560, watching mode 570, a query signature 580 and a query time stamp 590. The program identifier 560 identifies the video 308 that is currently playing. The watching mode 570 is control information for controlling processing of the PVRs 114 a, b and denotes the state of the PVRs 114 a, b, as discussed further below.” *Id.* at 10:4-27.

“As seen in the ongoing session join process of FIG. 6, the new participant PVR 114 b notifies the initiator PVR 114 a that it is joining the current session (step S602). The initiator PVR 114 a, in response, sends an originating synchronization message 402 to the new participant PVR 114 b (step S604). Upon receipt, the new participant PVR 114 b advances the time count of its video timer 212 so that the value of the time count matches time stamp A contained in the message 402, and, correspondingly, fast forwards its copy of video 308 (step S606). The point in the playback fast forwarded to corresponds to the value of the advanced time count, so that the new participant's playback has caught up content-wise with the playback of the initiator. The new participant PVR 114 b then transmits to the initiator PVR 114 a a join request message (step S608), to proceed with a fine tuning of its synchronization with the initiator PVR 114 a by means of time synchronization followed by frame synchronization. FIGS. 7A and 7B are flowchart depictions of an example of time synchronization according to the present invention.” *Id.* at 11:12-31.

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Id. at Fig. 7A (annotated).

“Next, the microprocessor 202 of the initiator's PVR 114 a checks its video timer 212, places its time count as time stamp A into field 510 of the originating synchronization message 402, and transmits the message 402 (step S704). The microprocessor 202 of the participant's PVR 114 b checks its video timer 212 upon receipt of message 402 and saves the time count as time stamp B in field 520 of the message 402. The participant's PVR 114 b further augments the originating

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<p>synchronization message 402, and thereby transforms the originating synchronization message 402 into the reply synchronization message 404, by creating field 530 and placing time stamp C from the participant's video timer 212 into field 530 of message 402. The participant's PVR 114 b then immediately transmits the reply message 404 to the initiator's PVR 114 a (step S705). Upon receipt of reply message 404, the initiator's microprocessor 202 checks its video timer 212 for the time of receipt, time D, and uses it, together with the time stamps in the fields of the message 404, to determine the time misregistration 540, TM, based on formula (1).” <i>Id.</i> at 11:52-12:4.</p> <p>“Time misregistration compensation (or “time compensation”), if any, is preferably carried out, by the participant, concurrent with the change, if any, in watching mode the participant performs in response to the message 550.” <i>Id.</i> at 13:4-7.</p> <p>“Time and frame synchronization is preferably performed periodically to keep the presentation synchronized. They are also preferably carried out with each function control command issued by a PVR 114 a as a result, for example, of interactive operation of input means to the PVR 114 a, b by a user viewing the presentation that changes the watching mode.” <i>Id.</i> at 15:32-38.</p> <p>To the extent that Janevski is found not to disclose this feature, it would have been obvious based on the disclosures of Janevski alone or in combination with the disclosures of one or more of the references cited for this limitation in Exhibits 953-01 through 953-09 or Exhibit 953-B for the reasons discussed herein and in Defendant’s cover pleading.</p>
18[c] based on the updated timing information, determining an updated differential between the clock time of the first zone player and the clock time of the second zone player.
<p>Janevski discloses this feature. <i>See, e.g.</i>, the following:</p> <p>“In CASE 3, an originating synchronization message 402 is sent from the originating to the participant PVR 114 b, and a reply synchronization message 404 is sent from the participant PVR 114 b to the initiator PVR 114 a. The time misregistration is CASE 3 is $\frac{1}{2}[(2+6)-(4+3)]=\frac{1}{2}$ second; in effect, the transmission time is $1\frac{1}{2}$ second and the participant lags the initiator by $\frac{1}{2}$ second. That is, the message 402 arrived at the participant PVR 114 b when the video timer 212 of the initiator PVR 114 a read $3\frac{1}{2}$ seconds, and, at the same time, the video timer 212 of the participant PVR 114 b read 3 seconds, this $3\frac{1}{2}-3=\frac{1}{2}$ second difference representing the $\frac{1}{2}$ second time misregistration magnitude. Accordingly, one second later, when the timer 212 of the initiator PVR 114 a reads $4\frac{1}{2}$ seconds, the participant sends the reply message 404, which arrives, after a transmission time of $1\frac{1}{2}$ seconds, when the timer 212 of the initiator PVR 114 a reads 6 seconds.” <i>Id.</i> at 9:54-10:3.</p> <p>“FIG. 5 illustrates an example of message formats utilized in the present invention to perform time synchronization. Referring back to any of Cases 1, 2 or 3 in FIG. 4, the originating message 402, at the time it is transmitted by the initiator PVR 114 a, has a field 510 containing time stamp A (corresponding to time A in FIG. 4), as shown in the first format in FIG. 4. Upon arrival at the</p>

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participant PVR 114 b, a field 520 containing time stamp B is added to the originating message 402, as shown in the second format. Just prior to sending the reply message 404 back to the initiator PVR 114 a, the participant PVR 114 b also adds a field 530 containing time stamp C, as shown in the third format, to convert the originating message 402 to the reply message 404. The initiator PVR 114 a receives the reply message 404 at time D (as in FIG. 4), calculates the time misregistration, TM, based on formula (1), and places the calculated time misregistration 540 into a status message 550, into which it also inserts a program identifier 560, watching mode 570, a query signature 580 and a query time stamp 590. The program identifier 560 identifies the video 308 that is currently playing. The watching mode 570 is control information for controlling processing of the PVRs 114 a, b and denotes the state of the PVRs 114 a, b, as discussed further below.” *Id.* at 10:4-27.

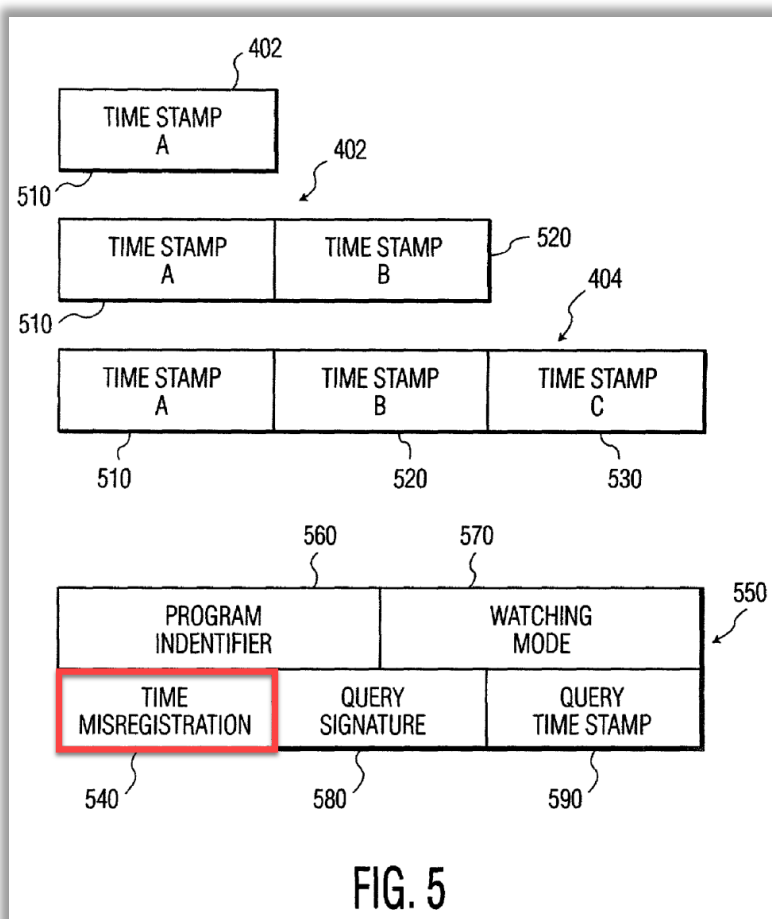


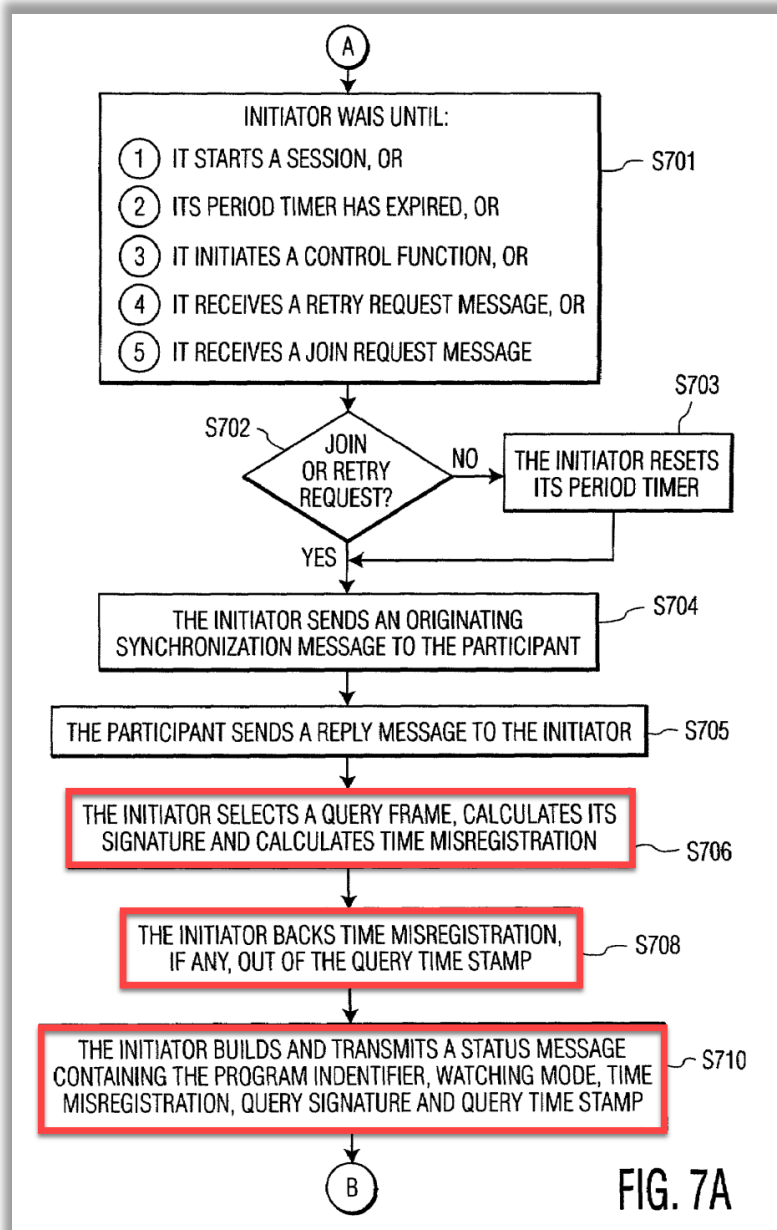
FIG. 5

Id. at Fig. 5 (annotated).

“FIGS. 7A and 7B are flowchart depictions of an example of time synchronization according to the present invention. In the current example, there are five possible triggering events for the synchronization process: (1) start of a session, (2) the initiator's period timer 213 expires, (3) the

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initiation of a control function, (4) a retry request message is received, or (5) a join request message is received (step S701). The initiator's period timer 213 counts the time interval until the initiator will again synchronize the session participants. A retry request message is issued by a participant to the initiator when an attempted frame synchronization has been unsuccessful, and requests that synchronization with the participant be retried after a predetermined period of time.” *Id.* at 11:29-42.



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Id. at Fig. 7A (annotated).

“Next, the microprocessor 202 of the initiator's PVR 114 a checks its video timer 212, places its time count as time stamp A into field 510 of the originating synchronization message 402, and transmits the message 402 (step S704). The microprocessor 202 of the participant's PVR 114 b checks its video timer 212 upon receipt of message 402 and saves the time count as time stamp B in field 520 of the message 402. The participant's PVR 114 b further augments the originating synchronization message 402, and thereby transforms the originating synchronization message 402 into the reply synchronization message 404, by creating field 530 and placing time stamp C from the participant's video timer 212 into field 530 of message 402. The participant's PVR 114 b then immediately transmits the reply message 404 to the initiator's PVR 114 a (step S705). Upon receipt of reply message 404, the initiator's microprocessor 202 checks its video timer 212 for the time of receipt, time D, and uses it, together with the time stamps in the fields of the message 404, to determine the time misregistration 540, TM, based on formula (1).” *Id.* at 11:52-12:4.

“In any event, if the program identifiers of the participant and initiator match, the participant's microprocessor 202 compensates for time misregistration, by advancing the time count of its video timer 212 by the magnitude of the time misregistration, if the time misregistration is positive, or by rolling back the time count of its video timer 212 by the magnitude of the time misregistration, if the time misregistration is negative (steps S722 through S728). (The advancing or rolling back of the time count is performed without executing any corresponding fast forward or rewind operation on the video 308 playing, these latter function being attended to instead during a subsequent frame compensation.) Time misregistration compensation (or “time compensation”), if any, is preferably carried out, by the participant, concurrent with the change, if any, in watching mode the participant performs in response to the message 550.” *Id.* at 12:59-13:7.

“In an alternative embodiment, the initiator can share time compensation duties with the participants. Particularly, if the session includes, in addition to the initiator, only one participant, the initiator can fully assume time misregistration compensation, and eliminate the overhead of maintaining a time misregistration field 540 in the status message 550.” *Id.* at 13:8-13.

To the extent that Janevski is found not to disclose this feature, it would have been obvious based on the disclosures of Janevski alone or in combination with the disclosures of one or more of the references cited for this limitation in Exhibits 953-01 through 953-09 or Exhibit 953-B for the reasons discussed herein and in Defendant's cover pleading.

22[a] The first zone player of claim 7, further comprising program instructions stored on the tangible, non-transitory computer-readable medium that are executable by the at least one processor to cause the first zone player to perform the following functions while operating as the slave of the synchrony group:

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<p>Janevski discloses this feature.</p> <p><i>See</i> claim 22[b], <i>infra</i>.</p> <p>To the extent that Janevski is found not to disclose this feature, it would have been obvious based on the disclosures of Janevski alone or in combination with the disclosures of one or more of the references cited for this limitation in Exhibits 953-01 through 953-09 or Exhibit 953-B for the reasons discussed herein and in Defendant’s cover pleading.</p>
<p>22[b] receiving, from the second zone player over the LAN, a command to adjust an individual volume of the first zone player; and in response to receiving the command, adjusting the individual volume of the first zone player.</p>
<p>Janevski discloses this feature. For example, Janevski discloses commands from a user of another zone player over the LAN. <i>See, e.g.</i>, the following:</p> <p>“Assuming that user 1 takes the lead as the “initiator”, user 1, via a remote control 116, via controls on the PVR 114 a itself, or via control commands displayed on the television and activated by an input device such as a keyboard or remote controller, would activate a menu for synchronized viewing on the PVR 114 a. User 1 would respond to and send the menu. Resulting other menus would be sent to user 2. The users would each indicate by their respective response to the menus they received whether or not they will be participating in the session. Based on the responses, a synchronized viewing session is established to begin at an agreed upon time. The agreed upon time may be a universal time, such as 9:00 P.M., or a relative time, such as in 5 minutes. A series of menus for establishing a viewing session are discussed in U.S. patent application Ser. No. 09/894,060, described above. A memory device and a processor preferably reside in either the PVRs 114 a, b or one of the other devices associated with system 110. Programming code associated with the system 110 preferably resides in the memory device and is processed by the processor.” <i>Id.</i> at 7:4-24.</p> <p>“First, to join a currently active synchronized viewing session, a user of a potential participant PVR 114 b solicits, via the telephone 124 or menu screens, the consent of the users of current participant PVRs 114 a, b and then signs on via a menu screen. If the users of the current participant PVRs 114 a, b approve, the potential participant PVR 114 b becomes a new participant PVR 114 b, to be synchronized with the initiator PVR 114 a.” <i>Id.</i> at 11:4-11.</p> <p>“As seen in the ongoing session join process of FIG. 6, the new participant PVR 114 b notifies the initiator PVR 114 a that it is joining the current session (step S602). The initiator PVR 114 a, in response, sends an originating synchronization message 402 to the new participant PVR 114 b (step S604). Upon receipt, the new participant PVR 114 b advances the time count of its video timer 212 so that the value of the time count matches time stamp A contained in the message 402, and, correspondingly, fast forwards its copy of video 308 (step S606). The point in the playback fast forwarded to corresponds to the value of the advanced time count, so that the new participant's playback has caught up content-wise with the playback of the initiator. The</p>

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new participant PVR 114 b then transmits to the initiator PVR 114 a a join request message (step S608), to proceed with a fine tuning of its synchronization with the initiator PVR 114 a by means of time synchronization followed by frame synchronization. FIGS. 7A and 7B are flowchart depictions of an example of time synchronization according to the present invention. In the current example, there are five possible triggering events for the synchronization process: (1) start of a session, (2) the initiator's period timer 213 expires, (3) the initiation of a control function, (4) a retry request message is received, or (5) a join request message is received (step S701). The initiator's period timer 213 counts the time interval until the initiator will again synchronize the session participants. A retry request message is issued by a participant to the initiator when an attempted frame synchronization has been unsuccessful, and requests that synchronization with the participant be retried after a predetermined period of time.” *Id.* at 11:12-42.

“Time and frame synchronization is preferably performed periodically to keep the presentation synchronized. They are also preferably carried out with each function control command issued by a PVR 114 a as a result, for example, of interactive operation of input means to the PVR 114 a, b by a user viewing the presentation that changes the watching mode. In the latter case, the user's PVR 114 a, b becomes the new initiator PVR 114 a, with whom all participant PVRs 114 b maintain synchronization, until another participant PVR 114 b assumes the role of initiator PVR 114 a by broadcasting a command that other participant PVRs 114 b follow its control function. Accordingly, an initiator PVR 114 a that receives a command that changes the watching mode knows that it is no longer the initiator PVR 114 a, and a participant PVR 114 b that issues the command knows that it is now the initiator PVR 114 a.” *Id.* at 15:32-47.

“30. The method of claim 25, further comprising the step of providing input means configured for causing a function control command to issue by interactive operation of said input means by a user responding to a rendering of said other stream, said command causing said information characteristic of content of said other stream to be generated.” *Id.* at 19:20-25.

Janevski also discloses that the zone players are connected with each other via the Internet. *See, e.g., id.* at 6:5-16; 6:45-58. As such, the first zone player's receiving of control information from other zone players is “over the LAN.” *See* claim 7[f], *supra*.

To the extent that Janevski is found not to disclose this feature, it would have been obvious based on the disclosures of Janevski alone or in combination with the disclosures of one or more of the references cited for this limitation in Exhibits 953-01 through 953-09 or Exhibit 953-B for the reasons discussed herein and in Defendant's cover pleading.

23[a] The first zone player of claim 7, further comprising program instructions stored on the tangible, non-transitory computer-readable medium that are executable by the at least one processor to cause the first zone player to perform the following functions:

Janevski discloses this feature.

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<p><i>See claim 23[B], infra.</i></p> <p>To the extent that Janevski is found not to disclose this feature, it would have been obvious based on the disclosures of Janevski alone or in combination with the disclosures of one or more of the references cited for this limitation in Exhibits 953-01 through 953-09 or Exhibit 953-B for the reasons discussed herein and in Defendant's cover pleading.</p>
<p>23[b] while operating as the slave of the synchrony group, receiving, from the second zone player over the LAN, control information that enables the first zone player to begin operating as the master of the synchrony group; and</p> <p>in response to receiving the control information, transitioning from operating as the slave of the synchrony group to operating as the master of the synchrony group.</p>
<p>Janevski discloses this feature. For example, Janevski discloses a first zone player (e.g., PVR 114a) receiving control information to assume the role of an initiator such as by executing a control function, upon which the first zone player transitions to operating as the initiator of the group. <i>See, e.g.,</i> the following:</p> <p>"FIG. 4 depicts a possible message flow design in the present invention to determine the misalignment, if any, in the respective timings of the video timers 212 of two PVRs 114 a, b, so that the timers can be synchronized. For simplicity of illustration, the discussion below focuses on synchronization between the initiator of the session and a single participant, because the initiator performs the same process to synchronize each participant, whereby all participants become synchronized. As mentioned above, the "initiator" may change during a session. Each time that a participant changes the watching mode i.e. executes a control function (rewind, fast forward, etc.), that participant broadcasts a command to all other participants (including the "current" initiator) and thereby becomes the new initiator." <i>Id.</i> at 8:39-52.</p> <p>"Time and frame synchronization is preferably performed periodically to keep the presentation synchronized. They are also preferably carried out with each function control command issued by a PVR 114 a as a result, for example, of interactive operation of input means to the PVR 114 a, b by a user viewing the presentation that changes the watching mode. In the latter case, the user's PVR 114 a, b becomes the new initiator PVR 114 a, with whom all participant PVRs 114 b maintain synchronization, until another participant PVR 114 b assumes the role of initiator PVR 114 a by broadcasting a command that other participant PVRs 114 b follow its control function. Accordingly, an initiator PVR 114 a that receives a command that changes the watching mode knows that it is no longer the initiator PVR 114 a, and a participant PVR 114 b that issues the command knows that it is now the initiator PVR 114 a." <i>Id.</i> at 15:32-47.</p> <p>"More than two users may participate in a synchronized viewing session; for example, users in three or more remote locations may arrange mutually by phone, by menus, by e-mail, by Internet chat, etc., to view a particular program simultaneously. During the session, viewers may drop out or be added to the session. When any session participant performs a control function (e.g.,</p>

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<p>start, pause, rewind, fast forward), that participant's PVR 114 b broadcasts a command for that function that is immediately communicated and effected in the PVR 114 b of each participant, to keep the presentation synchronized. To ensure that the PVRs 114 a, b participating in a session remain synchronous, a status message is sent out periodically by the “initiator”, i.e., the PVR 114 a that initiated the session. The status message is also transmitted with each command that is broadcasted in response to a participant performing a control function. The status message includes an indication of the program being watched, 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 from which playback to the message sender is being generated. The characteristic information is used to “fine tune” the synchronization by zeroing in on similar content being viewed on the message recipients' PVR 114 b.” <i>Id.</i> at 7:25-50.</p> <p>“FIG. 2 provides a more detailed look at an exemplary PVR 114 a in accordance with the present invention. Although the initiator PVR is shown, and, hence, the suffix “a” is used, any participant PVR would generally have the same architecture, because the role of initiator is handed off during a session to the latest PVR performing a control function. The PVR 114 a includes a receiver 113 a, and a video processing unit 201 comprised of a microprocessor 202, a remote control sensor 204, and a digital memory 206. The microprocessor 202 includes an image or video player 208, a stream characteristics unit 210, a video timer 212 and a period timer 213. The digital memory 206 includes a synchronization register 214, a signature processing workspace 216 a video block 218, a status buffer 220 and miscellaneous storage 222. The remote control sensor 204 receives a signal from the remote control 116 a, operated by a user or viewer of the television 122 a, and conveys a corresponding signal to the microprocessor 202. The microprocessor 202 reads from and writes to the digital memory 206.” <i>Id.</i> at 7:51-8:3.</p> <p><i>See also</i> claim 22, <i>supra</i>; Janevski at 7:51-8:3, 6:40-44, 17:44-46, 17:47-52.</p> <p>To the extent that Janevski is found not to disclose this feature, it would have been obvious based on the disclosures of Janevski alone or in combination with the disclosures of one or more of the references cited for this limitation in Exhibits 953-01 through 953-09 or Exhibit 953-B for the reasons discussed herein and in Defendant’s cover pleading.</p>
<p>24[a] The first zone player of claim 7, further comprising program instructions stored on the tangible, non-transitory computer-readable medium that are executable by the at least one processor to cause the first zone player to perform the following functions:</p>
<p>Janevski discloses this feature.</p> <p><i>See</i> claim 24[b], <i>infra</i>.</p> <p>To the extent that Janevski is found not to disclose this feature, it would have been obvious based on the disclosures of Janevski alone or in combination with the disclosures of one or more of</p>

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the references cited for this limitation in Exhibits 953-01 through 953-09 or Exhibit 953-B for the reasons discussed herein and in Defendant's cover pleading.
<p>24[b] while operating as the slave of the synchrony group, receiving a request to disengage from the synchrony group;</p> <p>in response to receiving the request to disengage from the synchrony group, disengaging from the synchrony group and transitioning from operating as the slave of the synchrony group to operating as a standalone zone player.</p>
<p>Janevski discloses this feature. For example, Janevski discloses that, “[d]uring the session, viewers may drop out ... [of] the session.” Janevski at 7:30-31. This means that, once no longer engaged in the synchronized viewing session, a PVR operates conventionally, i.e., “as a standalone zone player.” Janevski also teaches that participant PVRs receive directions from users, including a direction to perform control functions, to enter into a synchronized viewing session, and to assume the role of the initiator. <i>Id.</i> at 6:4-39, 15:32-47. <i>See, e.g.</i>, the following:</p> <p>“Referring to FIG. 1, an example of a synchronized PVR viewing system 110 in accordance with the present invention is illustrated. As illustrated in FIG. 1, broadcasts 112 a, b of a television program from network A is made pursuant to any communication means known to one having ordinary skill in the art, such as cable, digital cable, satellite, antenna, over the Internet or combinations thereof. The same network production, e.g., specific baseball game, is transmitted to each of House 1 and House 2. As the broadcasts 112 a, b enter House 1 and House 2, respectively, they are received by receivers 113 a, b housed within each of the respective PVRs 114 a, b. Hereinafter, the suffix “a” refers to the “initiator”, and the suffix “b” refers to a “participant”, in a synchronized viewing session. Initially, the “initiator” is the PVR that starts the session, although that role is handed off to any PVR that, as directed by its user, performs a control function (e.g., stop, pause, fast forward, reverse). All other PVRs participating in the session are “participants”. Depending on context, the user of the initiator PVR is referred to as the “initiator”, and the user of a participant PVR is referred to as a “participant”. Since the broadcasts 112 a, b are received by the user, the user has the ability to record the broadcast 112 a, b in the PVR 114 a, b. The broadcast may be received in a receiver housed within a set-top box, DVD player, VHS player, personal computer, television, etc., and then routed to the PVR 114 a, b. The user has the ability to record a variety of different programs in the PVR 114 a, b along the bandwidth of the incoming broadcast signal. Additionally, since the broadcast signal is routed to each house separately, each house has the ability to separately turn the broadcast signal on or off. The PVR 114 a, b has an output that is connected to an input on a television 122 a, b so that the user may view the recorded programs on the television 122 a, b.” <i>Id.</i> at 6:4-39.</p> <p>“Time and frame synchronization is preferably performed periodically to keep the presentation synchronized. They are also preferably carried out with each function control command issued by a PVR 114 a as a result, for example, of interactive operation of input means to the PVR 114 a, b by a user viewing the presentation that changes the watching mode. In the latter case, the</p>

Exhibit 953-01: Janevski

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<p>user's PVR 114 a, b becomes the new initiator PVR 114 a, with whom all participant PVRs 114 b maintain synchronization, until another participant PVR 114 b assumes the role of initiator PVR 114 a by broadcasting a command that other participant PVRs 114 b follow its control function. Accordingly, an initiator PVR 114 a that receives a command that changes the watching mode knows that it is no longer the initiator PVR 114 a, and a participant PVR 114 b that issues the command knows that it is now the initiator PVR 114 a.” <i>Id.</i> at 15:32-47.</p> <p>To the extent that Janevski is found not to disclose this feature, it would have been obvious based on the disclosures of Janevski alone or in combination with the disclosures of one or more of the references cited for this limitation in Exhibits 953-01 through 953-09 or Exhibit 953-B for the reasons discussed herein and in Defendant’s cover pleading.</p>
25[pre] Tangible, non-transitory computer-readable storage media, wherein the tangible, non-transitory computer-readable storage media is provisioned with software that is executable to cause a first zone player to perform functions comprising:
<p>Defendant does not concede that the preamble is limiting. To the extent it is limiting, Janevski discloses the preamble.</p> <p><i>See</i> claims 7(d) and 7(e), <i>supra</i>.</p> <p>To the extent that Janevski is found not to disclose the preamble, it would have been obvious based on the disclosures of Janevski alone or in combination with the disclosures of one or more of the references cited for this limitation in Exhibits 953-01 through 953-09 or Exhibit 953-B for the reasons discussed herein and in Defendant’s cover pleading.</p>
25[a] receiving a request to enter into a synchrony group with at least a second zone player that is communicatively coupled with the first zone player over a local area network (LAN);
<p>Janevski discloses this feature.</p> <p><i>See</i> claim 7(f), <i>supra</i>.</p> <p>To the extent that Janevski is found not to disclose this feature, it would have been obvious based on the disclosures of Janevski alone or in combination with the disclosures of one or more of the references cited for this limitation in Exhibits 953-01 through 953-09 or Exhibit 953-B for the reasons discussed herein and in Defendant’s cover pleading.</p>
25[b] in response to receiving the request to enter into the synchrony group, entering into the synchrony group with the second zone player, wherein the first zone player is selected to begin operating as a slave of the synchrony group and the second zone player is selected to begin operating as a master of the synchrony group, and wherein the first zone player

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operates in accordance with a clock time that differs from a clock time of the second zone player;
<p>Janevski discloses this feature.</p> <p><i>See claim 7(g), supra.</i></p> <p>To the extent that Janevski is found not to disclose this feature, it would have been obvious based on the disclosures of Janevski alone or in combination with the disclosures of one or more of the references cited for this limitation in Exhibits 953-01 through 953-09 or Exhibit 953-B for the reasons discussed herein and in Defendant's cover pleading.</p>
25[c] after beginning to operate as the slave of the synchrony group:
<p>Janevski discloses this feature.</p> <p><i>See claim 7(h), supra.</i></p> <p>To the extent that Janevski is found not to disclose this feature, it would have been obvious based on the disclosures of Janevski alone or in combination with the disclosures of one or more of the references cited for this limitation in Exhibits 953-01 through 953-09 or Exhibit 953-B for the reasons discussed herein and in Defendant's cover pleading.</p>
25[d] receiving, from the second zone player over the LAN, clock timing information that comprises at least one reading of the clock time of the second zone player;
<p>Janevski discloses this feature.</p> <p><i>See claim 7(i), supra.</i></p> <p>To the extent that Janevski is found not to disclose this feature, it would have been obvious based on the disclosures of Janevski alone or in combination with the disclosures of one or more of the references cited for this limitation in Exhibits 953-01 through 953-09 or Exhibit 953-B for the reasons discussed herein and in Defendant's cover pleading.</p>
25[e] based on the received clock timing information, determining a differential between the clock time of the first zone player and the clock time of the second zone player;
<p>Janevski discloses this feature.</p> <p><i>See claim 7(j), supra.</i></p> <p>To the extent that Janevski is found not to disclose this feature, it would have been obvious based on the disclosures of Janevski alone or in combination with the disclosures of one or more of</p>

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the references cited for this limitation in Exhibits 953-01 through 953-09 or Exhibit 953-B for the reasons discussed herein and in Defendant’s cover pleading.
25[f] receiving, from the second zone player over the LAN, (a) audio information for at least a first audio track and (b) playback timing information associated with the audio information for the first audio track that comprises an indicator of a first future time, relative to the clock time of the second zone player, at which the first and second zone players are to initiate synchronous playback of the audio information for the first audio track;
<p>Janevski discloses this feature.</p> <p><i>See claim 7(k), supra.</i></p> <p>To the extent that Janevski is found not to disclose this feature, it would have been obvious based on the disclosures of Janevski alone or in combination with the disclosures of one or more of the references cited for this limitation in Exhibits 953-01 through 953-09 or Exhibit 953-B for the reasons discussed herein and in Defendant’s cover pleading.</p>
25[g] updating the first future time to account for the determined differential between the clock time of the first zone player and the clock time of the second zone player; and
<p>Janevski discloses this feature.</p> <p><i>See claim 7(l), supra.</i></p> <p>To the extent that Janevski is found not to disclose this feature, it would have been obvious based on the disclosures of Janevski alone or in combination with the disclosures of one or more of the references cited for this limitation in Exhibits 953-01 through 953-09 or Exhibit 953-B for the reasons discussed herein and in Defendant’s cover pleading.</p>
25[h] when the clock time of the first zone player reaches the updated first future time, initiating synchronous playback of the received audio information with the second zone player.
<p>Janevski discloses this feature.</p> <p><i>See claim 7(m), supra.</i></p> <p>To the extent that Janevski is found not to disclose this feature, it would have been obvious based on the disclosures of Janevski alone or in combination with the disclosures of one or more of the references cited for this limitation in Exhibits 953-01 through 953-09 or Exhibit 953-B for the reasons discussed herein and in Defendant’s cover pleading.</p>

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<p>28[a] The tangible, non-transitory computer-readable media of claim 25, wherein the determined differential between the clock time of the first zone player and the clock time of the second zone player comprises an initial differential between the clock time of the first zone player and the clock time of the second zone player, and wherein the tangible, non-transitory computer-readable media is provisioned with further software that is executable to cause the first zone player to perform additional functions comprising, while operating as a slave of the synchrony group:</p>
<p>Janevski discloses this feature.</p> <p><i>See claims 28(b) and 28(c), infra.</i></p> <p>To the extent that Janevski is found not to disclose this feature, it would have been obvious based on the disclosures of Janevski alone or in combination with the disclosures of one or more of the references cited for this limitation in Exhibits 953-01 through 953-09 or Exhibit 953-B for the reasons discussed herein and in Defendant’s cover pleading.</p>
<p>28[b] after determining the initial differential between the clock time of the first zone player and the clock time of the second zone player, receiving, from the second zone player over the LAN, updated clock timing information that includes at least one updated reading of the clock time of the second zone player; and</p>
<p>Janevski discloses this feature.</p> <p><i>See claim 18(b), supra.</i></p> <p>To the extent that Janevski is found not to disclose this feature, it would have been obvious based on the disclosures of Janevski alone or in combination with the disclosures of one or more of the references cited for this limitation in Exhibits 953-01 through 953-09 or Exhibit 953-B for the reasons discussed herein and in Defendant’s cover pleading.</p>
<p>28[c] based on the updated timing information, determining an updated differential between the clock time of the first zone player and the clock time of the second zone player.</p>
<p>Janevski discloses this feature.</p> <p><i>See claim 18(c), supra.</i></p> <p>To the extent that Janevski is found not to disclose this feature, it would have been obvious based on the disclosures of Janevski alone or in combination with the disclosures of one or more of the references cited for this limitation in Exhibits 953-01 through 953-09 or Exhibit 953-B for the reasons discussed herein and in Defendant’s cover pleading.</p>

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<p>29[a] The tangible, non-transitory computer-readable media of claim 25, wherein the tangible, non-transitory computer-readable media is provisioned with further software that is executable to cause the first zone player to perform additional functions comprising, while operating as a slave of the synchrony group:</p>
<p>Janevski discloses this feature.</p> <p><i>See claim 29(b), infra.</i></p> <p>To the extent that Janevski is found not to disclose this feature, it would have been obvious based on the disclosures of Janevski alone or in combination with the disclosures of one or more of the references cited for this limitation in Exhibits 953-01 through 953-09 or Exhibit 953-B for the reasons discussed herein and in Defendant’s cover pleading.</p>
<p>29[b] receiving, from the second zone player over the LAN, a command to adjust an individual volume of the first zone player; and in response to receiving the command, adjusting the individual volume of the first zone player.</p>
<p>Janevski discloses this feature.</p> <p><i>See claim 22(b), supra.</i></p> <p>To the extent that Janevski is found not to disclose this feature, it would have been obvious based on the disclosures of Janevski alone or in combination with the disclosures of one or more of the references cited for this limitation in Exhibits 953-01 through 953-09 or Exhibit 953-B for the reasons discussed herein and in Defendant’s cover pleading.</p>
<p>30[a] The tangible, non-transitory computer-readable media of claim 25, wherein the tangible, non-transitory computer-readable media is provisioned with further software that is executable to cause the first zone player to perform additional functions comprising:</p>
<p>Janevski discloses this feature.</p> <p><i>See claim 30(b), infra.</i></p> <p>To the extent that Janevski is found not to disclose this feature, it would have been obvious based on the disclosures of Janevski alone or in combination with the disclosures of one or more of the references cited for this limitation in Exhibits 953-01 through 953-09 or Exhibit 953-B for the reasons discussed herein and in Defendant’s cover pleading.</p>

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<p>30[b] while operating as the slave of the synchrony group, receiving, from the second zone player over the LAN, control information that enables the first zone player to begin operating as the master of the synchrony group; and</p> <p>in response to receiving the control information, transitioning from operating as the slave of the synchrony group to operating as the master of the synchrony group.</p>
<p>Janevski discloses this feature.</p> <p><i>See claim 23(b), supra.</i></p> <p>To the extent that Janevski is found not to disclose this feature, it would have been obvious based on the disclosures of Janevski alone or in combination with the disclosures of one or more of the references cited for this limitation in Exhibits 953-01 through 953-09 or Exhibit 953-B for the reasons discussed herein and in Defendant's cover pleading.</p>