Exhibit 001-01: 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. 11,080,001 (the "'001 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 12, 13, 14, 17, 18, 19, 20, 21, 22, 23, 24, 25, 28, 29, 30, 31, 32, 33 (the "asserted claims") of the '001 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 001-01 through 001-09 or Exhibit 001-B, because the '001 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 '001 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.

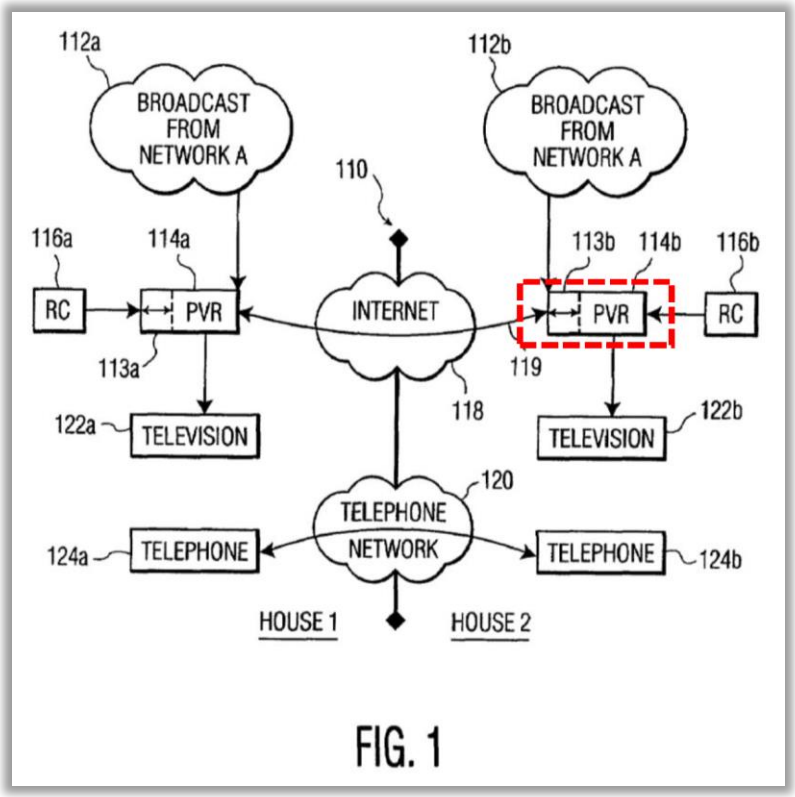
---

[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.

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.

Exemplary Disclosures
12[pre] A first zone player comprising:
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). *See, e.g.*, the following: "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. "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.'" *Id.* at 6:5-22.

Exemplary Disclosures



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.

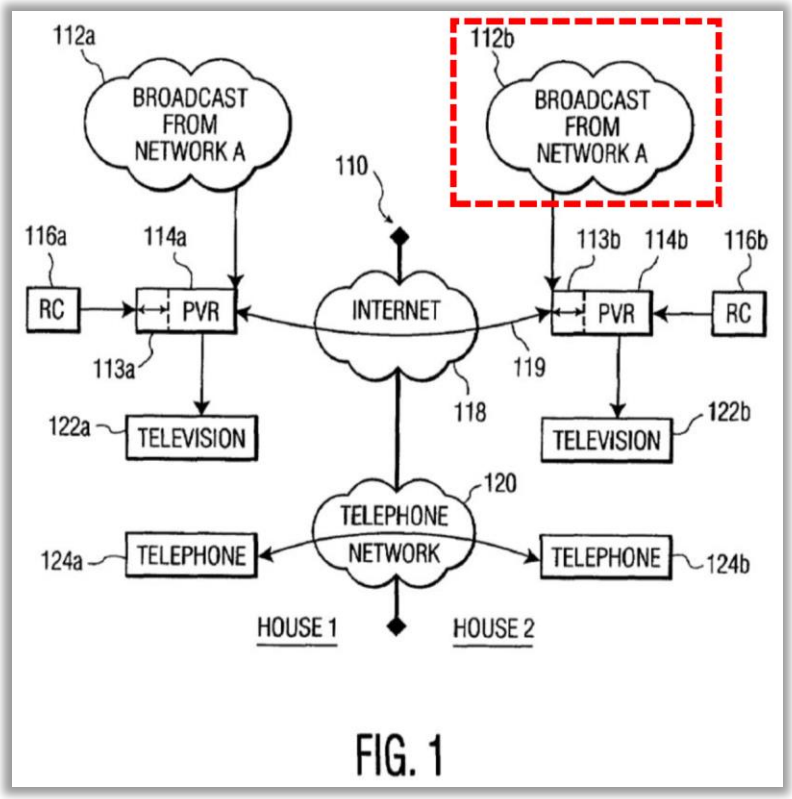
"This invention applies generally to synchronizing presentation of renderable content of two or more digital bit streams. The presentation may be merely visual or merely aural or both visual and aural. The bit streams need not contain both image and audio data. Thus, the characteristic information may 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*.

Exemplary Disclosures
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 001-01 through 001-09 or Exhibit 001-B for the reasons discussed herein and in Defendant's cover pleading.
12[a] a network interface that is configured to communicatively couple the first zone player to at least one data network;
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. *See, e.g.*, the following: "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." *Id.* at 6:45-51. "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. "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." *Id.* at 2:6-15. "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

Exemplary Disclosures

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.



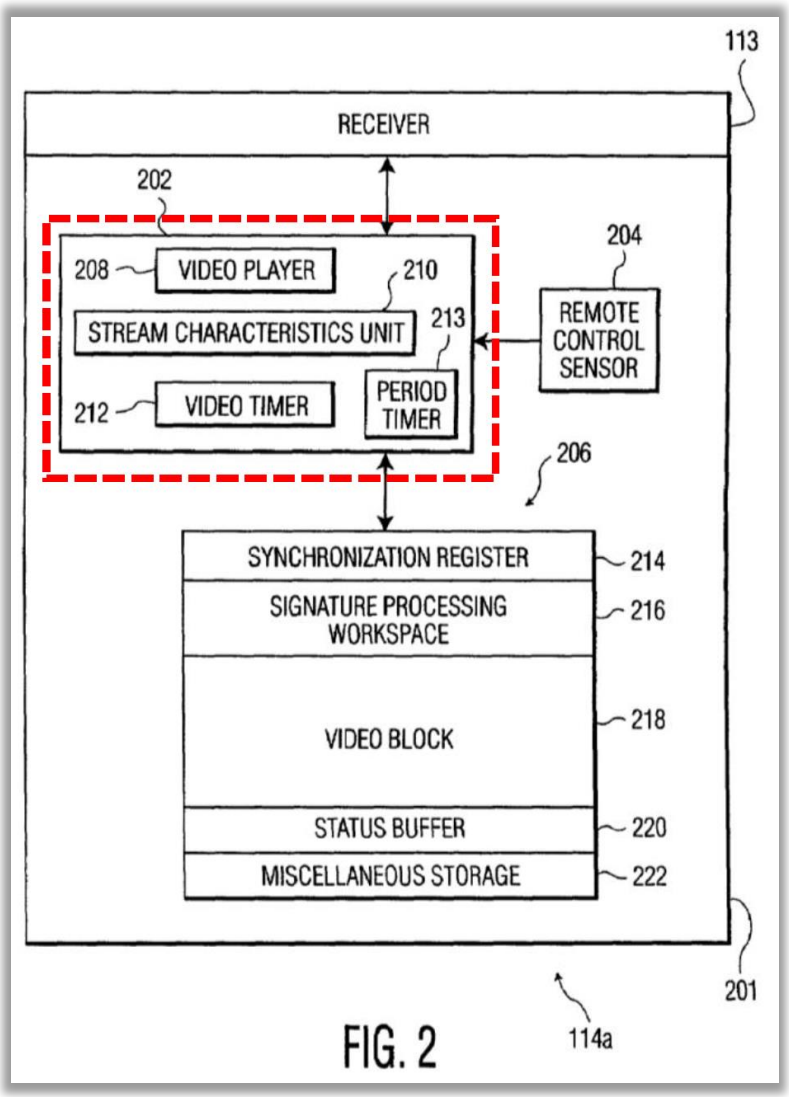
Id. at Fig. 1 (annotated).

"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 being generated. The characteristic information is used to 'fine tune' the synchronization by

Exemplary Disclosures
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 depictions of an example of time synchronization according to the present invention. In the

Exemplary Disclosures
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. "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. "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. 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 001-01 through 001-09 or Exhibit 001-B for the reasons discussed herein and in Defendant's cover pleading.
12[b] at least one processor;
Janevski discloses this feature. For example, Janevski discloses that the zone players (e.g., PVRs) include a microprocessor. *See, e.g.*, the following: "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

Exemplary Disclosures
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.

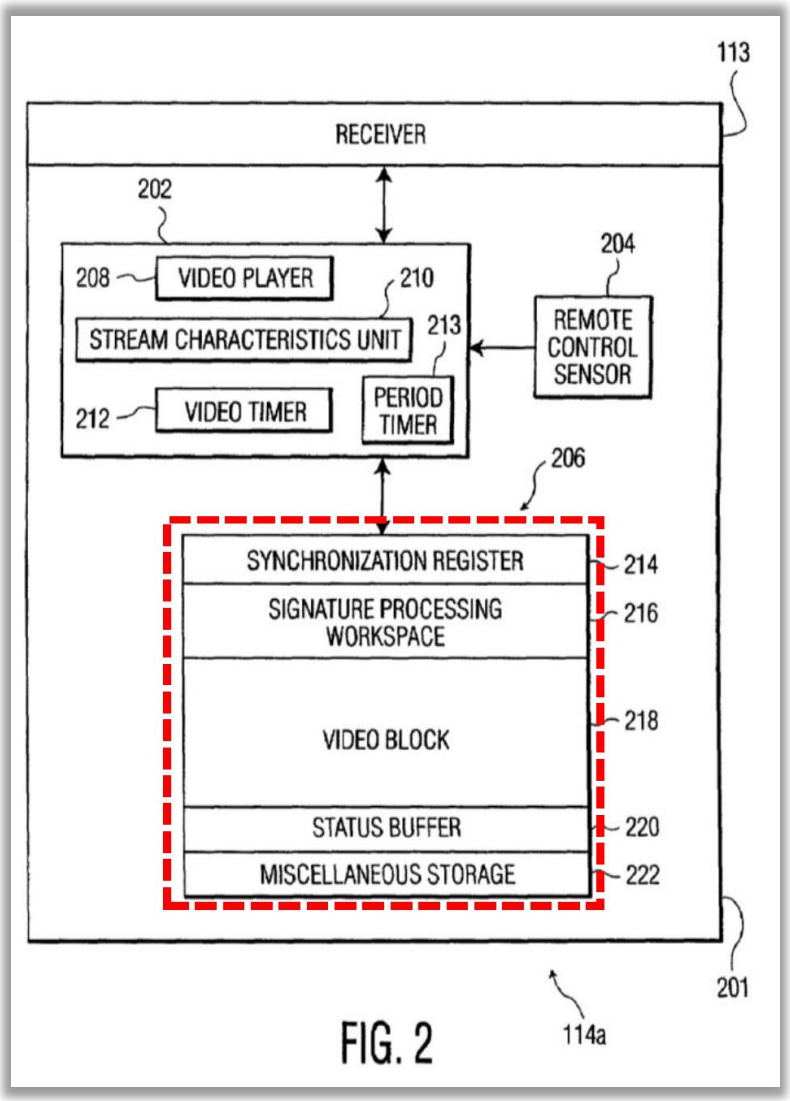


Id. at Fig. 2 (annotated).

"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

Exemplary Disclosures
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. “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.” *Id.* at 7:4-24. 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 001-01 through 001-09 or Exhibit 001-B for the reasons discussed herein and in Defendant’s cover pleading.
12[c] a tangible, non-transitory computer-readable medium; and program instructions stored on the tangible, non-transitory computer-readable medium that are executable by the at least one processor such that the first zone player is configured to perform functions comprising:
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 that are processed by the processor. *See, e.g.*, the following: “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

Exemplary Disclosures
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.



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,

Exemplary Disclosures
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. 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.

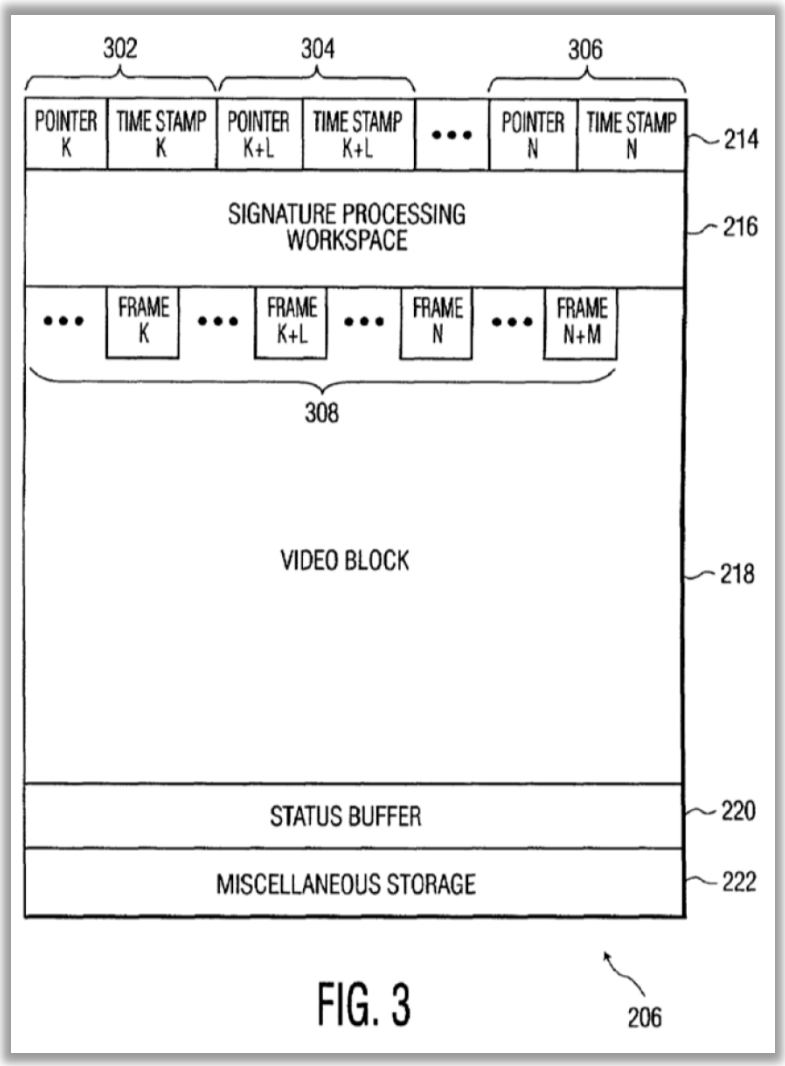


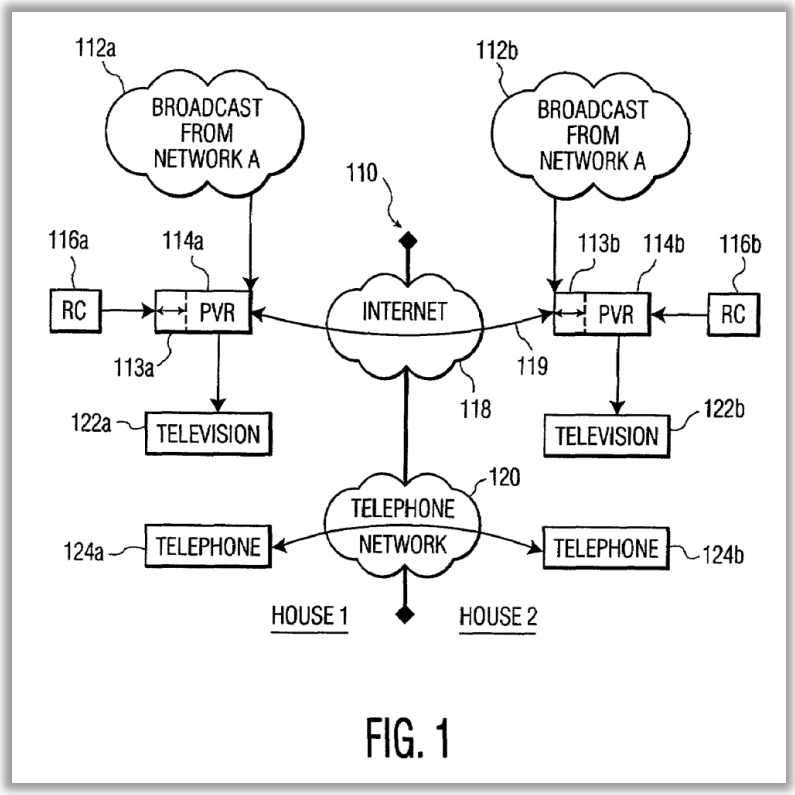
FIG. 3

Id. at Fig. 3.

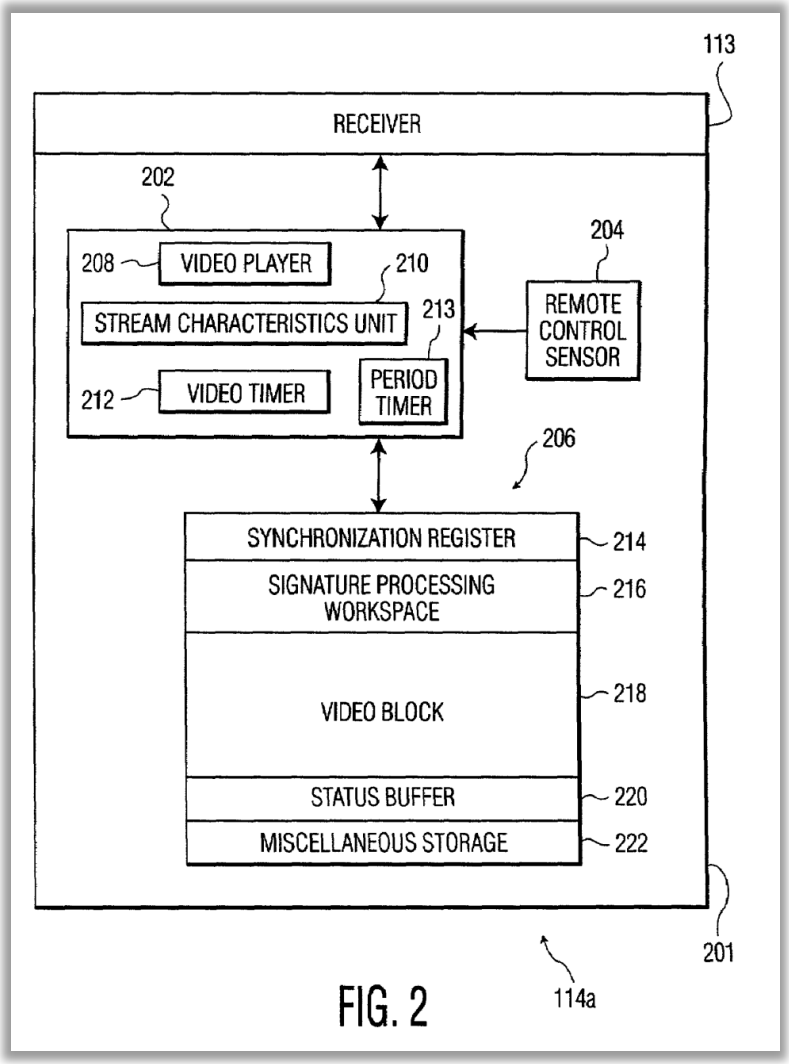
Exemplary Disclosures
"Assuming that user 1 takes the lead as the 'initiator', user 1, via a remote control 116, via controls on the PVR 114 a itself, or via control commands displayed on the television and activated by an input device such as a keyboard or remote controller, would activate a menu for 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." *Id.* at 7:4-24. 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 001-01 through 001-09 or Exhibit 001-B for the reasons discussed herein and in Defendant's cover pleading.
12[d] receiving, via the network interface, a request to engage in synchronous playback of audio content as part of a synchrony group that includes at least a second zone player that is communicatively coupled to the first zone player via the at least one data network;
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. *See, e.g.*, the following: "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 16:33-43. "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. "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

Exemplary Disclosures
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." *Id.* at 11:12-42. "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. "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. 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 001-01 through 001-09 or Exhibit 001-B for the reasons discussed herein and in Defendant's cover pleading.
12[e] after receiving the request to enter into the synchrony group:

Exemplary Disclosures
detecting an indication that the first zone player is to operate in (a) one of a control-master mode or a control-slave mode for the synchrony group and (b) one of an audio-master mode or an audio-slave mode for the synchrony group; and **beginning to operate in the synchrony group in accordance with the indication;**
Janevski discloses this feature. For example, Janevski discloses a participant PVR may execute control functions, that the initiator and participant PVRs are both connected to remote controls and provide menus for executing controls, and that the initiator PVR transmits indicators of time and information characteristic of content to the participant PVRs. Further, Janevski discloses that a participant PVR can become the new initiator upon execution of a control function. *See, e.g.*, the following: "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." *Id.* at Abstract. "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'." *Id.* at 6:18-26. "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.

Exemplary Disclosures
 *Id.* at Fig. 1.

Exemplary Disclosures



Id. at Fig. 2.

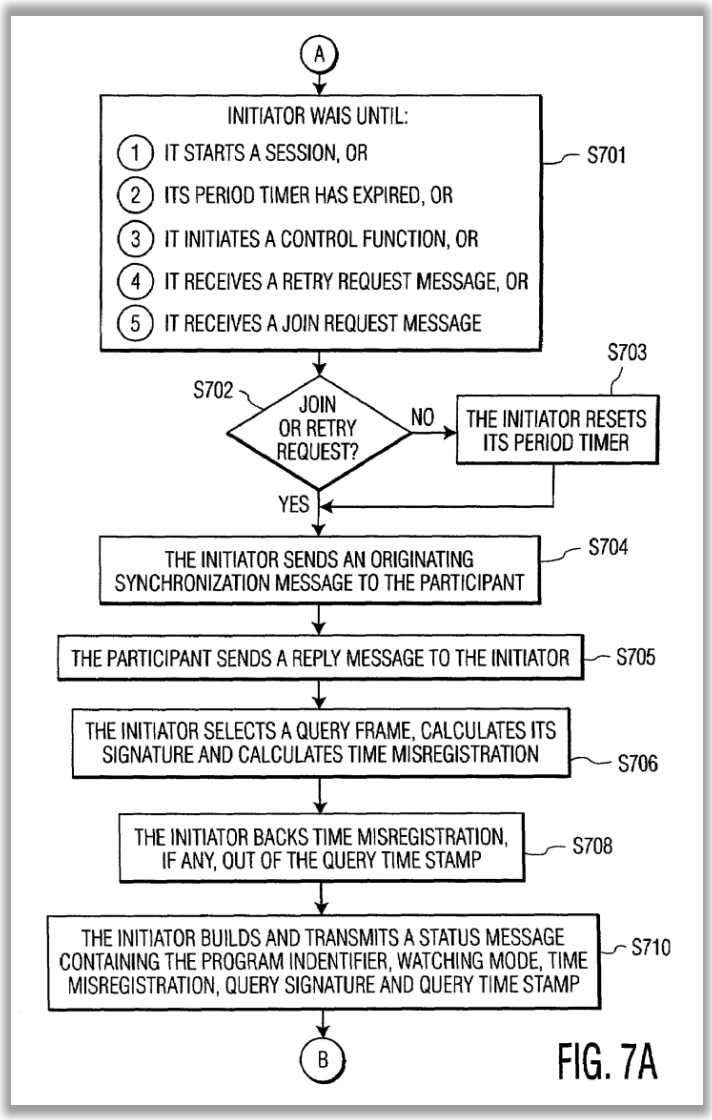
"In order to implement the system 110, one of the users, e.g. user 1 from House 1, will call the other user, i.e. user 2 from House 2, and the respective users will agree to simultaneously and synchronously watch a pre-recorded broadcast on their respective televisions. Here, pre-recorded broadcasts are intended to include live broadcasts that have been buffered for a delay period, which some receivers have the ability to do, so that the broadcast can be replayed continuously in a staggered time frame without commercials. After the users agree to view a program in synchronization, one of them would take the lead to initiate the system." *Id.* at 6:59-7:3.

"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

Exemplary Disclosures
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." *Id.* at 7:4-20. "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 7:31-50. "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. 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

Exemplary Disclosures
forward, etc.), that participant broadcasts a command to all other participants (including the 'current' initiator) and thereby becomes the new initiator." *Id.* at 8:39-52. "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. "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. "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

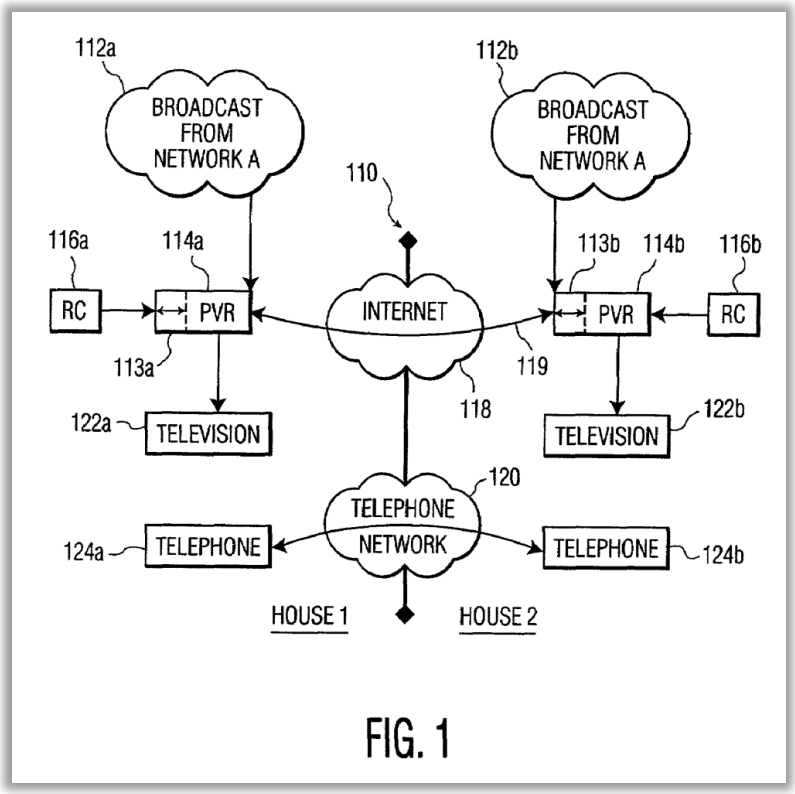
Exemplary Disclosures
synchronization with the participant be retried after a predetermined period of time." *Id.* at 11:12-42.



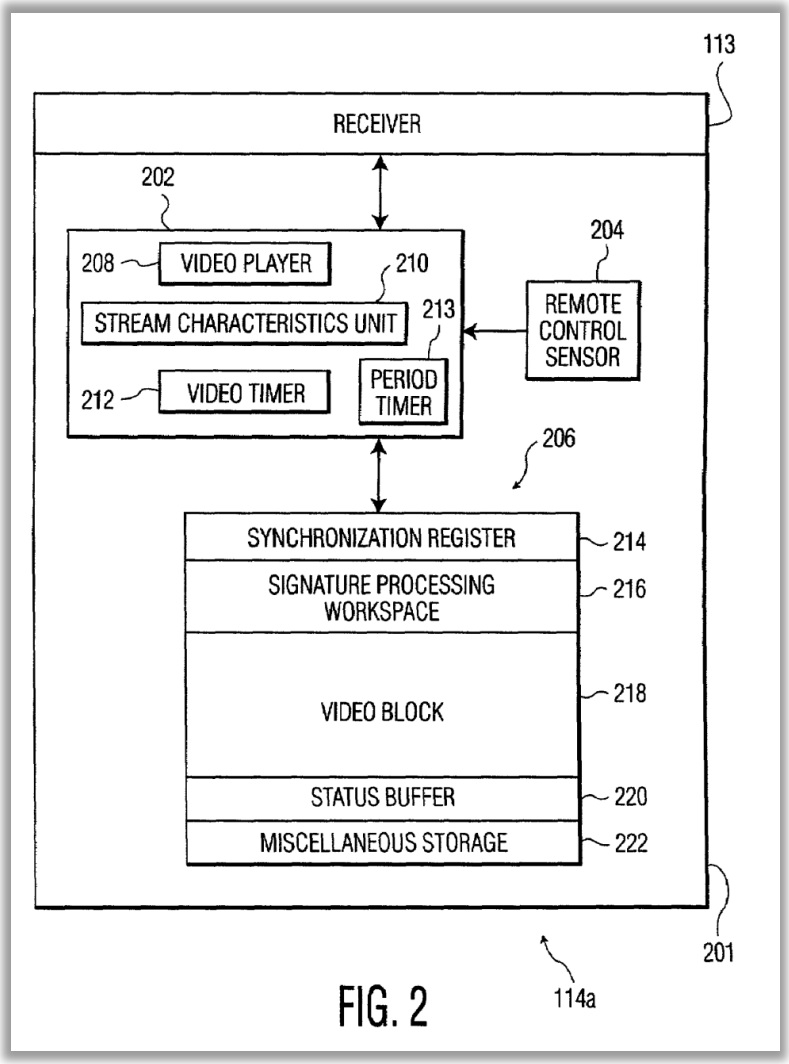
Id. at Fig. 7A.

"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

Exemplary Disclosures
participant can bridge the gap synchronously, one rewinding and the other fast forwarding, to synchronize faster." *Id.* at 13:8-21. "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. "The embodiments disclosed are merely exemplary of the invention. For example, when watching mode changes, the program identifier 560 and the watching mode 570 can be broadcasted without an accompanying time misregistration 540, query signature 580 and query time stamp 590, so that the new watching mode is put into effect faster by all recipient PVRs. Alternatively, the program identifier 560 and the watching mode 570 can be transmitted unaccompanied only in the case of selected watching mode transitions, e.g., to fast forward or to rewind. In fact, whether or not watching mode changes, the query signature 580 and the query time stamp 590 can be transmitted separately from time misregistration 540, program identifier 560 and watching mode 570; that is, time misregistration and frame misregistration can be calculated and compensated for asynchronously." *Id.* at 15:48-63. 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 001-01 through 001-09 or Exhibit 001-B for the reasons discussed herein and in Defendant's cover pleading.
12[f] wherein, while operating in the control-master mode for the synchrony group, the first zone player is configured to: **receive, via the network interface, first control information for the synchrony group from a network device that is communicatively coupled to the first zone player; and** **based on the first control information, cause, via the network interface, at least one playback action to be applied in the synchrony group;**
Janevski discloses this feature. For example, Janevski discloses that synchronized viewing can be activated by an input device, keyboard, or remote control associated with one of the PVRs, and that control functions are thereby communicated and effected to each of the participant PVRs. *See, e.g.*, the following:

Exemplary Disclosures
"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 Fig. 1.

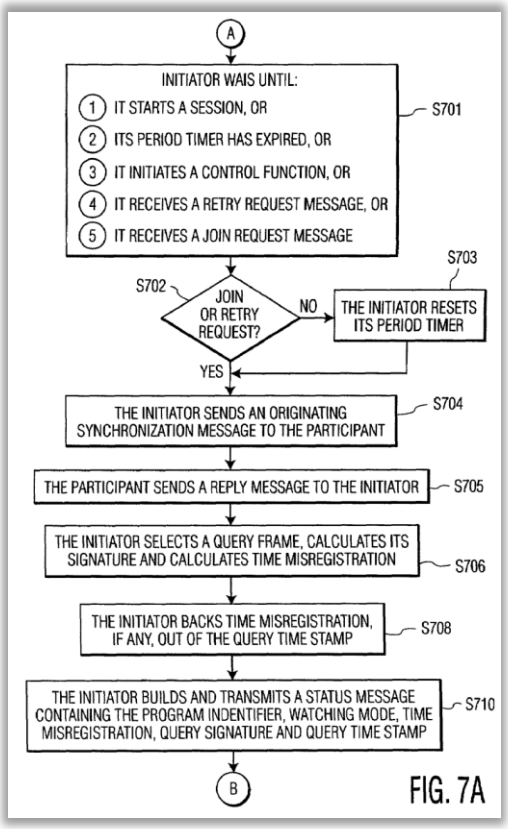
Exemplary Disclosures

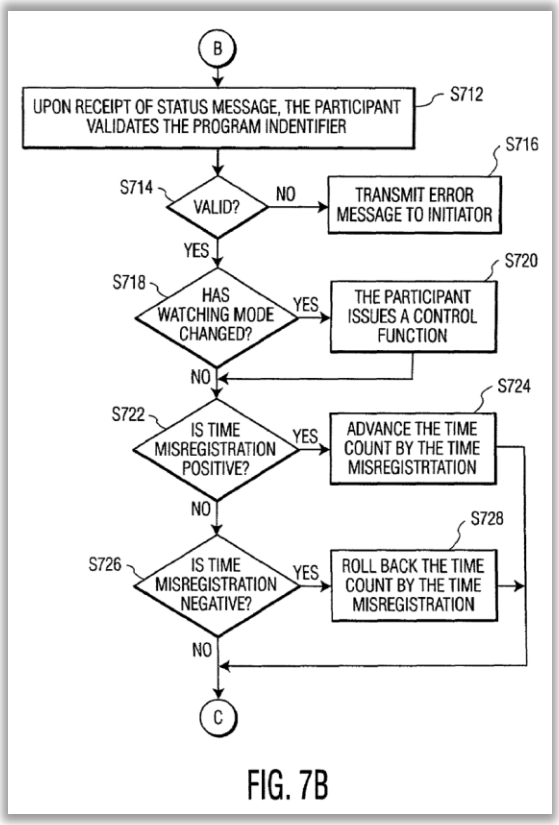


Id. at Fig. 2.

"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."

Exemplary Disclosures
"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 Figs. 7A & 7B.

"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

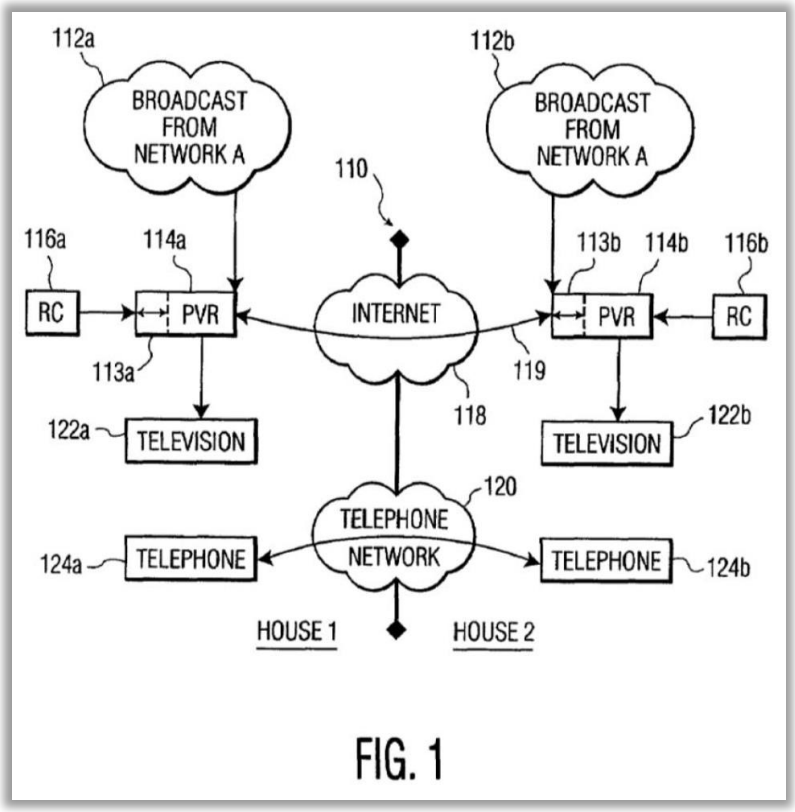
Exemplary Disclosures
storage 222. The remote control sensor 204 receives a signal from the remote control 116 a, operated by a user or viewer of the television 122 a, and conveys a corresponding signal to the microprocessor 202." "In operation, a potential viewer of the video 308, arranges for a particular 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." 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 001-01 through 001-09 or Exhibit 001-B for the reasons discussed herein and in Defendant's cover pleading.
12[g] wherein, while operating in the control-slave mode for the synchrony group, the first zone player is configured to: **receive, via the network interface, second control information from another zone player;** **and perform one or more playback actions in accordance with the second control information;**
Janevski discloses this feature. For example, Janevski discloses that when one of the PVRs executes a control function associated with a playback action (*e.g.*, rewind, fast-forward, stop), all of the other PVRs follow synchronously. *See, e.g.*, the following: *See* claim 12[f], *supra*. *See also*: "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." *Id.* at Abstract. "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." *Id.* at 7:31-36.

Exemplary Disclosures
"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 8:48-52. "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)." *Id.* at 11:31-36. "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. 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 001-01 through 001-09 or Exhibit 001-B for the reasons discussed herein and in Defendant's cover pleading.
12[h] wherein, while operating in the audio-master mode for the synchrony group, the first zone player is configured to: **obtain audio information that is representative of the audio content;** **generate playback timing information associated with the obtained audio information that is indicative of at least one future time that is relative to a reference clock time and denotes a time at which at least the first and second zone players are to engage in synchronous playback of a corresponding portion of the obtained audio information; and** **transmit, via the network interface, the obtained audio information and the generated playback timing information to the second zone player; and**
Janevski discloses this feature. For example, Janevski discloses a PVR that obtains "audio information" and generates associated "playback timing information" before transmitting the obtained audio information and playback timing information to a second PVR. *See, e.g.*, the following: Janevski discloses that a PVR may receive from another PVR a status message that includes information about renderable content such as audio. For example, the status message includes

Exemplary Disclosures
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 one PVR generates and transmits to another. "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. "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

Exemplary Disclosures
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 transform coefficients, as appropriate, can be used to characterize the content of the bit streams." *Id.* at 16:34-43. Janevski also discloses that the audio information may be "obtained" by one of the PVR before being transmitted, along with associated "playback timing information," to another one of the PVRs. "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.

Exemplary Disclosures



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

Exemplary Disclosures
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.

Exemplary Disclosures

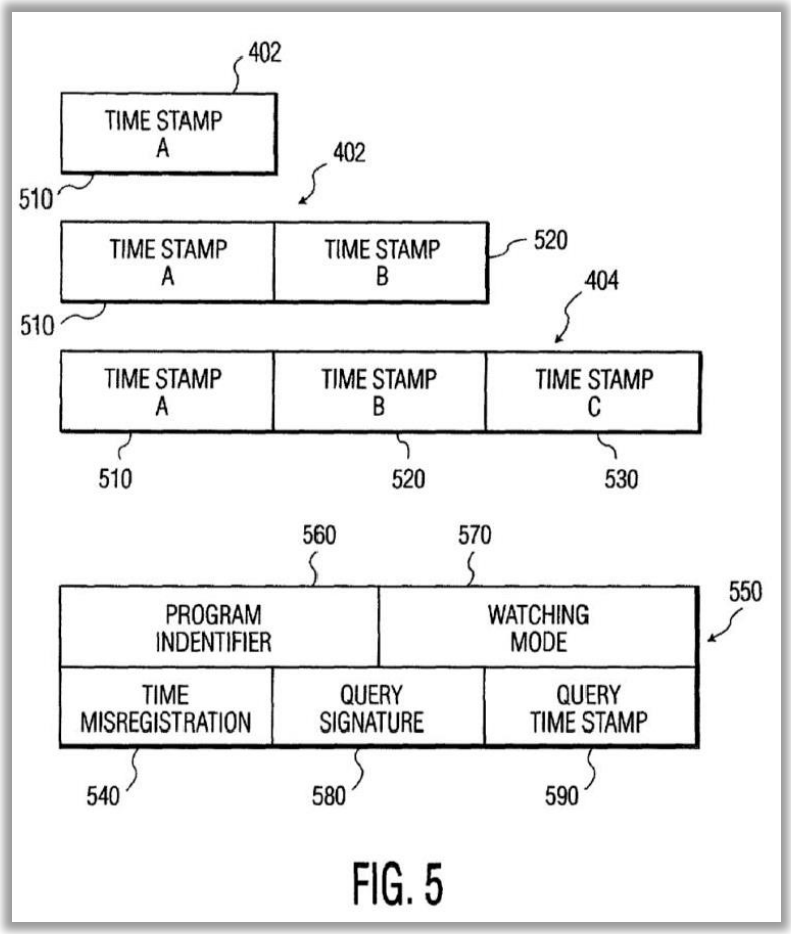


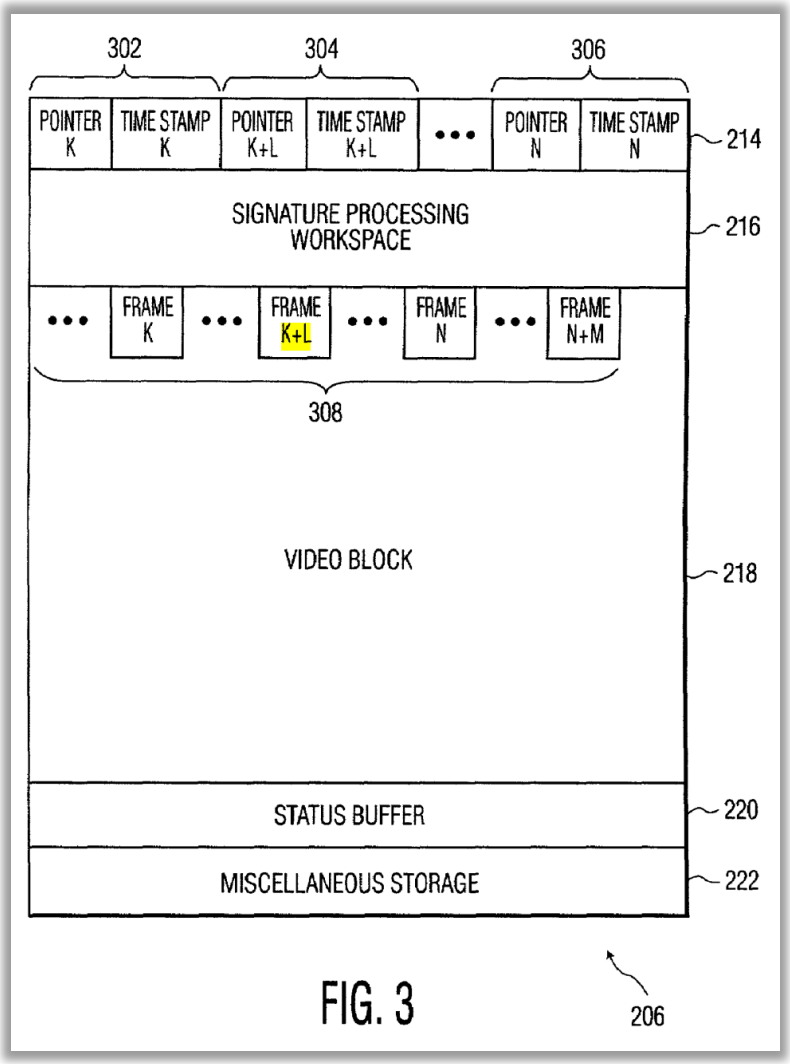
FIG. 5

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.

"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

Exemplary Disclosures
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 8:4-22.



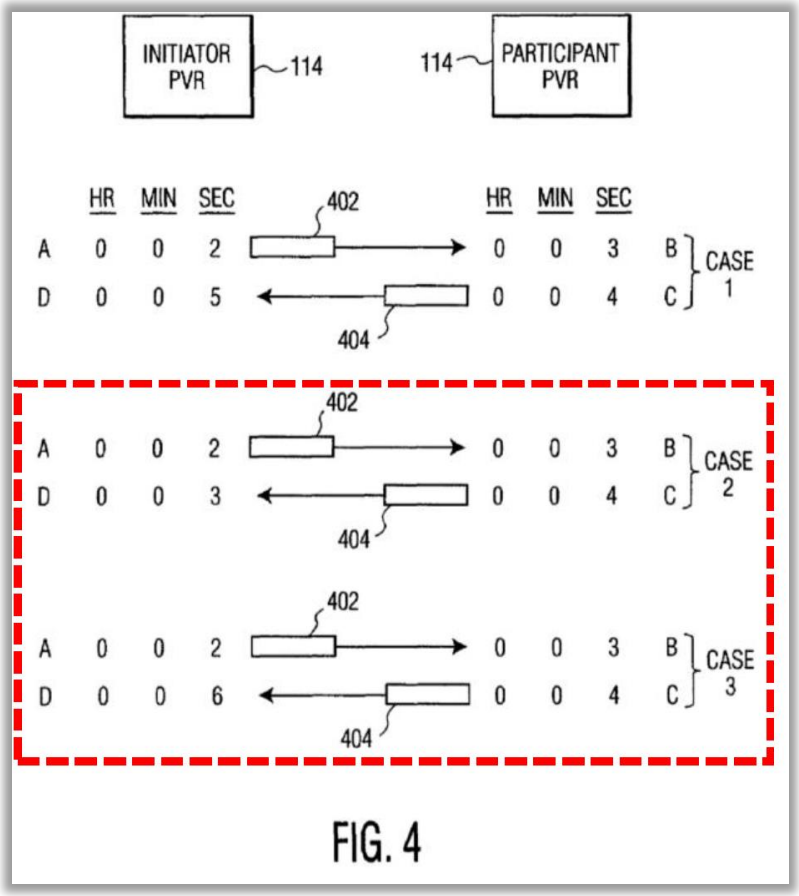
Id. at Fig. 3.

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 001-01 through 001-09 or Exhibit 001-B for the reasons discussed herein and in Defendant's cover pleading.

Exemplary Disclosures
12[i] wherein, while operating in the audio-slave mode for the synchrony group, the first zone player is configured to: **receive, via the network interface, audio information and playback timing information associated with the received audio information from another zone player; and** **engage in synchronous playback of the received audio information with at least the second zone player based on the received playback timing information associated with the received audio information while a local clock time of the first zone player differs from a local clock time of the second zone player.**
Janevski discloses this feature. For example, as discussed above with respect to claim 12[h], Janevski discloses a PVR that transmits audio information and playback timing information to a second PVR. And as discussed below, Janevski discloses that, during synchronous playback, the clock time of the first zone player (e.g., provided by the video timer 212 of PVR 114a) operates in accordance with its own clock, independent of the clock time of the second zone player (e.g., provided by the video timer 212 of PVR 114b). Janevski also discloses a formula used to compensate for the difference in the clock times provided by the two independent clocks, which Janevski refers to as "time misregistration." *See, e.g.*, the following: "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." *Id.* at 8:39-42.

Exemplary Disclosures



Id. at Fig. 4 (annotated).

"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=½[(A+D)−(C+B)] (1)" *Id.* at 9:30-34.

"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 9:15-29.

"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 ½[(2+3)−(4+3)]=−1 second.

Exemplary Disclosures
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 ½[(2+6)−(4+3)]=½ second; in effect, the transmission time is 1½ second and the participant lags the initiator by ½ 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 3½ seconds, and, at the same time, the video timer 212 of the participant PVR 114 b read 3 seconds, this 3½−3=½ second difference representing the ½ second time misregistration magnitude. Accordingly, one second later, when the timer 212 of the initiator PVR 114 a reads 4½ seconds, the participant sends the reply message 404, which arrives, after a transmission time of 1½ seconds, when the timer 212 of the initiator PVR 114 a reads 6 seconds." *Id.* at 9:54-10:3. "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. "It will also be initially assumed that when the video timer of one PVR shows as its output the same time as does the other PVR's video timer, that the respective videos playing are at the same point content-wise in their respective playbacks. When any PVR fast forwards or rewinds, this correspondingly and synchronously advances or rolls back the time count of its respective video timer." *Id.* at 2:16-22. "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

Exemplary Disclosures
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." *Id.* at 2:23-35. 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 001-01 through 001-09 or Exhibit 001-B for the reasons discussed herein and in Defendant's cover pleading.
13. The first zone player of claim 12, wherein detecting an indication that the first zone player is to operate in (a) one of a control-master mode or a control-slave mode for the synchrony group and (b) one of an audio-master mode or an audio-slave mode for the synchrony group comprises detecting an indication that the first zone player is to operate in (a) the control-master mode for the synchrony group and (b) the audio-master mode for the synchrony group.
Janevski discloses this feature. *See* claim 12[e], *supra*. *See also*: "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. "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." *Id.* at 8:39-52.

Exemplary Disclosures
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 001-01 through 001-09 or Exhibit 001-B for the reasons discussed herein and in Defendant's cover pleading.
14. The first zone player of claim 13, wherein the obtained audio information comprises a beginning of the obtained audio information, and wherein the playback timing further comprises a future time relative to the reference clock time that denotes a time at which at least the first and second zone players are to initiate synchronous playback at the beginning of the obtained audio information.
Janevski discloses this feature. *See* claim 12[h], *supra*. *See also*: "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." *Id.* at 7:4-20. "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. Otherwise, if the participant is viewing the same program, the participant's microprocessor checks the watching mode 570 in the message 550 (S718). If it matches the current watching mode in the participant's status buffer 220, processing proceeds. If it does not match, the participant's microprocessor 202 issues a control function to its PVR 114 b to immediately convert its current watching mode to match the watching mode received in the message 550, i.e. to, for example, fast forward or rewind in response to the initiator's fast forward or rewind (step S720). The participant's microprocessor 202 also makes the corresponding change in watching mode in it status buffer 220." *Id.* at 12:37-58.

Exemplary Disclosures
"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 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 *p1709Xexample, 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. 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 001-01 through 001-09 or Exhibit 001-B for the reasons discussed herein and in Defendant's cover pleading.
17. The first zone player of claim 12, wherein beginning to operate in the synchrony group in accordance with the indication comprises either (a) transitioning from operating in the audio-master mode to operating in the audio-slave mode or (b) transitioning from operating in the audio-slave mode to operating in the audio-master mode.
Janevski discloses this feature. For example, Janeski discloses that a participant PVR may assume the role of the initiator. *See, e.g.*, the following: "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." *Id.* at Abstract. "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,

Exemplary Disclosures
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'." *Id.* at 6:16-22. "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." *Id.* at 8:39-52. "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. 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 001-01 through 001-09 or Exhibit 001-B for the reasons discussed herein and in Defendant's cover pleading.
18. The first zone player of claim 12, wherein the first control information identifies particular audio content to be played back by the synchrony group that is available at an audio source outside of the at least one data network, and wherein causing the at least one playback action to be applied in the synchrony group comprises causing a zone player operating in the audio-master mode to obtain audio information that is representative of the particular audio content.
Janevski discloses this feature. For example, Janevski discloses that a program identifier identifies a program for playback and that content can be contained from an outside source such as broadcast, service provider, or a compact disk containing video and audio content. *See, e.g.*, the following: "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

Exemplary Disclosures
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." *Id.* at 6:27-39.

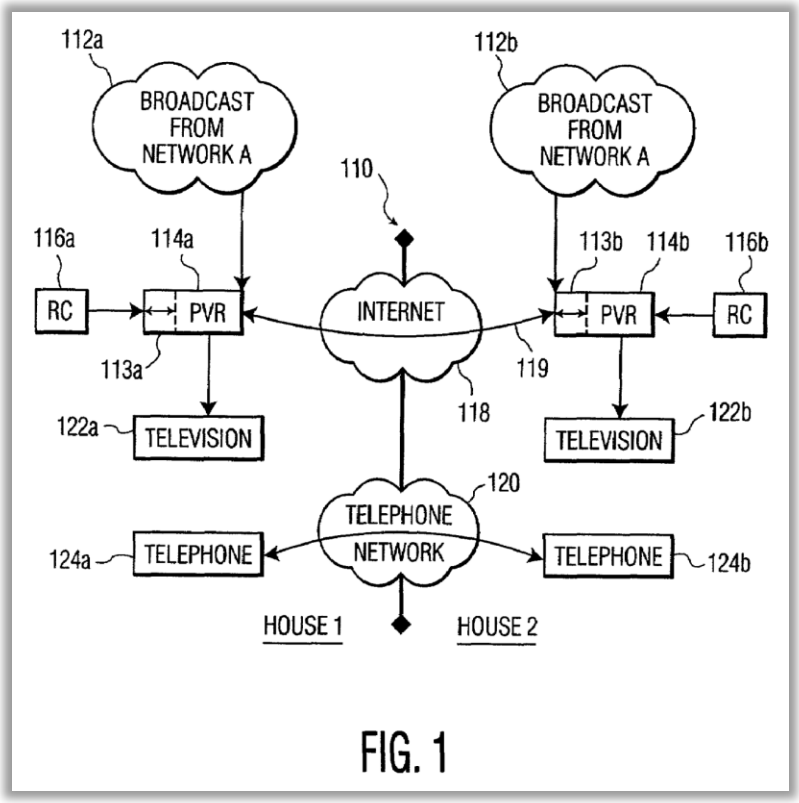


FIG. 1

Id. at Fig. 1.

"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." *Id.* at 7:4-20.

"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

Exemplary Disclosures
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 7:31-50. "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 10:17-27. "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. "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. Otherwise, if the participant is viewing the same program, the participant's microprocessor checks the watching mode 570 in the message 550 (S718). If it matches the current watching mode in the participant's status buffer 220, processing proceeds. If it does not match, the participant's microprocessor 202 issues a control function to its PVR 114 b to immediately convert its current watching mode to match the watching mode received in the message 550, i.e. to, for example, fast forward or rewind in response to the initiator's fast forward or rewind (step S720). The participant's microprocessor 202 also makes the corresponding change in watching mode in it status buffer 220." *Id.* at 12:37-58. "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

Exemplary Disclosures
playback is being synchronized need not be remotely located, nor locally located at their respective PVRs." *Id.* at 16:10-16. "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. 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 001-01 through 001-09 or Exhibit 001-B for the reasons discussed herein and in Defendant's cover pleading.
19. The first zone player of claim 12, wherein the at least one future time relative to the reference clock time comprise at least one first future time that is determined based on a local clock of a zone player other than the first zone player.
Janevski discloses this feature. For example, Janevski discloses that a future time may be pre-determined, determined based on a universal time, or determined based on the local clock of the participant or initiator PVR (*i.e.*, based on the local clock of either the first or second zone player. *See, e.g.*, the following: "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." *Id.* at 7:4-20. "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

Exemplary Disclosures
forward, etc.), that participant broadcasts a command to all other participants (including the "current" initiator) and thereby becomes the new initiator." *Id.* at 8:39-52.

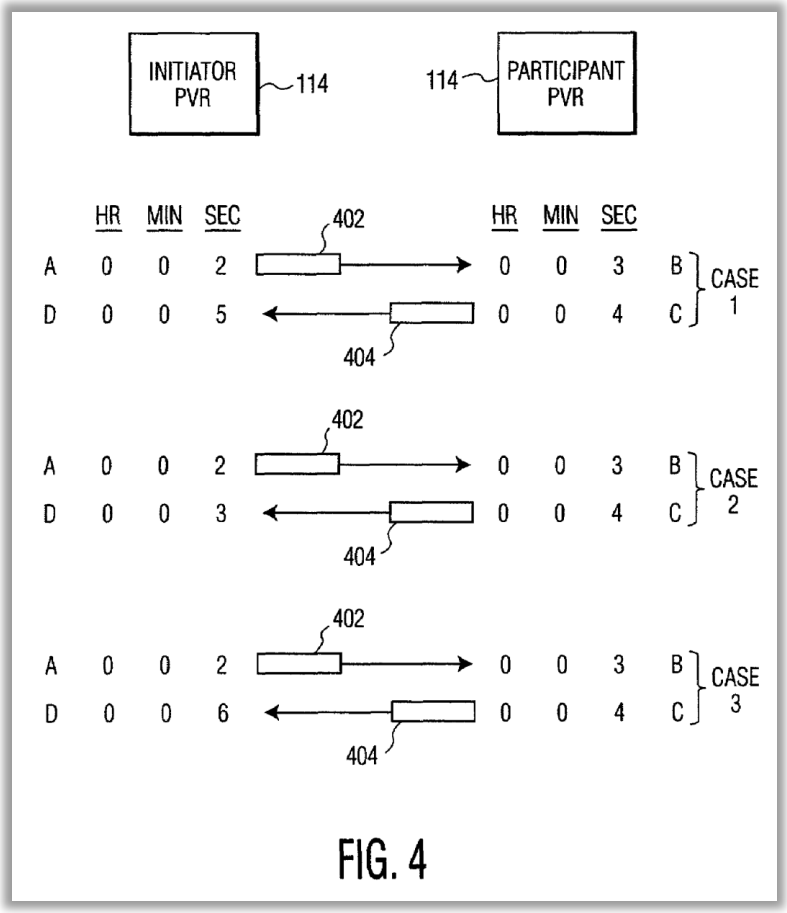


FIG. 4

Id. at Fig. 4.

Exemplary Disclosures

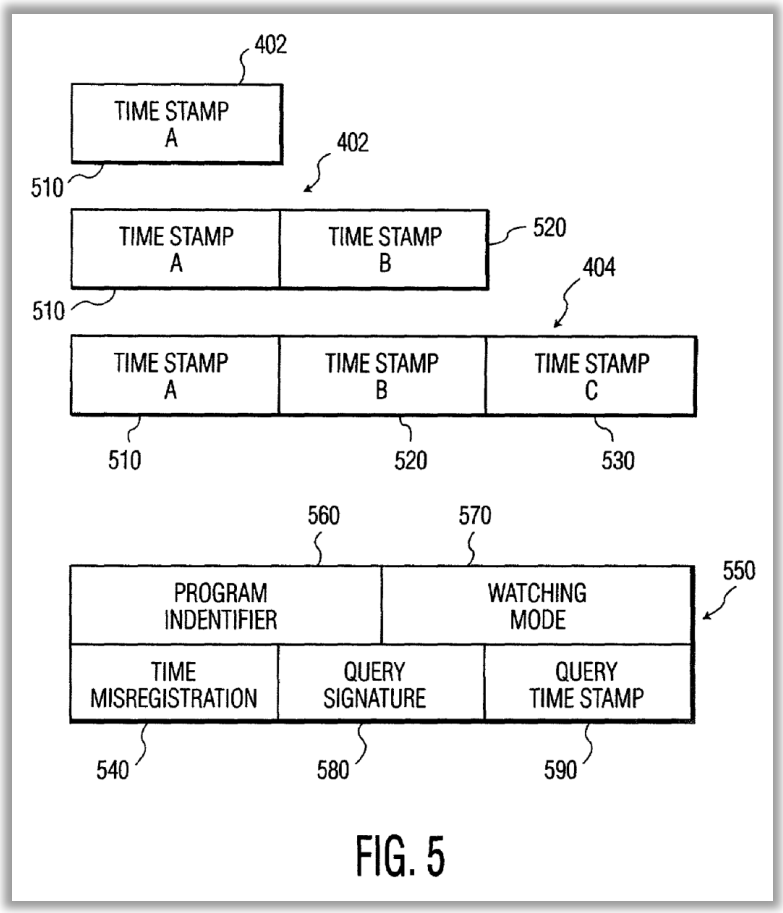


FIG. 5

Id. at Fig. 5.

"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)." *Id.* at 8:53-64.

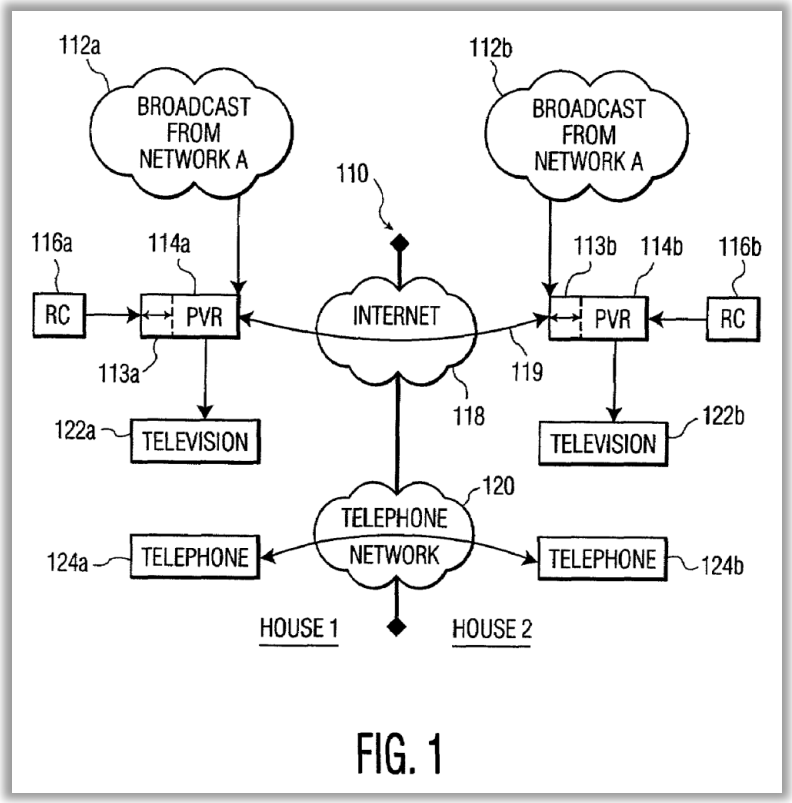
"Next, the microprocessor 202 of the initiator's PVR 114 a checks its video timer 212, places its time count as time stamp A into field 510 of the originating synchronization message 402, and transmits the message 402 (step S704). The microprocessor 202 of the participant's PVR 114 b checks its video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

Exemplary Disclosures
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. 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.” *Id.* at 13:8-21. “Moreover, the present invention, however, is not limited to any particular time synchronization method.” *Id.* at 13:22-23. “As another option, the video player 208 can be implemented to proceed forward or backward in the video 308 by an amount of “video time” that is based on the value of MINOFF. The video time increment or decrement can be determined from a table referenced by MINOFF or can be calculated algorithmically. Alternatively, movement forward and/or backward in video time can be dictated by a complex set of predetermined instructions, such as a macro, e.g., go forward by time x and back by one I frame.” *Id.* at 14:55-63. “As was the case with time compensation, frame compensation duties can be shared among the initiator and participants, in an alternative embodiment.” *Id.* at 15:3-5. “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

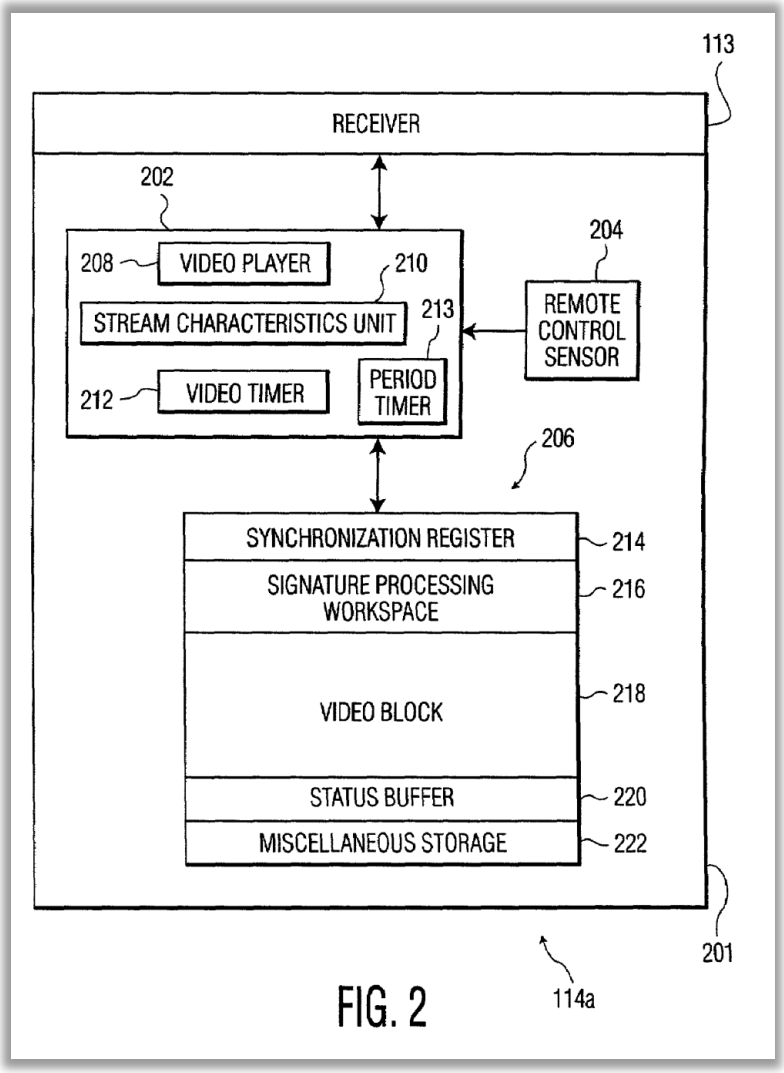
Exemplary Disclosures
control 116 a to navigate and complete a menu that has appeared on the television 122 a. Menu templates could reside, for example, in miscellaneous storage 222. The potential viewer, acting as the initiator of a synchronized viewing session, then, by means of an initiation menu, 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 *p1709Xexample, 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. "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. 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 001-01 through 001-09 or Exhibit 001-B for the reasons discussed herein and in Defendant's cover pleading.
20. The first zone player of claim 12, wherein at least one future time relative to the reference clock time comprises at least one first future time that is determined based a local clock of the first zone player.
Janevski discloses this feature. *See* claim 14, *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 001-01 through 001-09 or Exhibit 001-B for the reasons discussed herein and in Defendant's cover pleading.
21. The first zone player of claim 12, wherein the second control information comprises information indicative of a volume adjustment, and wherein performing one or more playback actions in accordance with the second control information comprises adjusting a playback volume of the first zone player.

Exemplary Disclosures
Janevski discloses this feature. For example Janevski discloses that bit stream may contain image and audio data, and characteristic information associated with audible sounds. *See, e.g.*, the following: "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." "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." "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." "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."

Exemplary Disclosures



Id. at Fig. 1.

Exemplary Disclosures
 FIG. 2 *Id.* at Fig. 2. 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 001-01 through 001-09 or Exhibit 001-B for the reasons discussed herein and in Defendant's cover pleading.
22. The first zone player of claim 12, wherein the playback timing information that is received while operating in the audio-slave mode comprises at least one future time at which at least the first and second zone players are to engage in synchronous playback of a corresponding portion of the received audio information, and wherein being configured

Exemplary Disclosures
while operating in the audio-slave mode to engage in synchronous playback of the received audio information with at least the second zone player comprises being configured to: **update the at least one future time to account for a differential between the local clock time of the first zone player and a local clock time of another zone player; and** **when the local clock time of the first zone player reaches the updated at least one future time, engage in synchronous playback of the corresponding portion of the received audio information with at least the second zone player.**
Janevski discloses this feature. *See* claim 14, *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 001-01 through 001-09 or Exhibit 001-B for the reasons discussed herein and in Defendant's cover pleading.
23[pre] Tangible, non-transitory computer-readable media having instructions stored therein, wherein the instructions, when executed, cause a first zone player to perform functions comprising:
Janevski discloses this feature. *See* claim 12[c], *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 001-01 through 001-09 or Exhibit 001-B for the reasons discussed herein and in Defendant's cover pleading.
23[a] receiving, via a network interface at the first zone player, a request to engage in synchronous playback of audio content as part of a synchrony group that includes at least a second zone player that is communicatively coupled to the first zone player via at least one data network;
Janevski discloses this feature. *See* claim 12[d], *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

Exemplary Disclosures
the references cited for this limitation in Exhibits 001-01 through 001-09 or Exhibit 001-B for the reasons discussed herein and in Defendant's cover pleading.
23[b] after receiving the request to enter into the synchrony group: **detecting an indication that the first zone player is to operate in (a) one of a control-master mode or a control-slave mode for the synchrony group and (b) one of an audio-master mode or an audio-slave mode for the synchrony group; and** **beginning to operate in the synchrony group in accordance with the indication;**
Janevski discloses this feature. *See* claim 12[e], *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 001-01 through 001-09 or Exhibit 001-B for the reasons discussed herein and in Defendant's cover pleading.
23[c] wherein, while operating in the control-master mode for the synchrony group, the first zone player is configured to: **receive, via the network interface, first control information for the synchrony group from a network device that is communicatively coupled to the first zone player; and** **based on the first control information, cause, via the network interface, at least one playback action to be applied in the synchrony group;**
Janevski discloses this feature. *See* claim 12[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 001-01 through 001-09 or Exhibit 001-B for the reasons discussed herein and in Defendant's cover pleading.
23[d] wherein, while operating in the control-slave mode for the synchrony group, the first zone player is configured to: **receive, via the network interface, second control information from another zone player; and**

Exemplary Disclosures
perform one or more playback actions in accordance with the second control information;
Janevski discloses this feature. *See* claim 12[g], *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 001-01 through 001-09 or Exhibit 001-B for the reasons discussed herein and in Defendant's cover pleading.
23[e] wherein, while operating in the audio-master mode for the synchrony group, the first zone player is configured to: **obtain audio information that is representative of the audio content;** **generate playback timing information associated with the obtained audio information that is indicative of one or more future times relative to a reference clock time, wherein an individual future time denotes a time at which at least the first and second zone players are to engage in synchronous playback of a corresponding portion of the obtained audio information; and** **transmit, via the network interface, the obtained audio information and the generated playback timing information to the second zone player; and**
Janevski discloses this feature. *See* claim 12[h], *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 001-01 through 001-09 or Exhibit 001-B for the reasons discussed herein and in Defendant's cover pleading.
23[f] wherein, while operating in the audio-slave mode for the synchrony group, the first zone player is configured to: **receive, via the network interface, audio information and playback timing information associated with the received audio information from another zone player; and** **engage in synchronous playback of the received audio information with at least the second zone player based on the received playback timing information associated with the**

Exemplary Disclosures
received audio information while a local clock time of the first zone player differs from a local clock time of the second zone player.
Janevski discloses this feature. *See* claim 12[i], *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 001-01 through 001-09 or Exhibit 001-B for the reasons discussed herein and in Defendant's cover pleading.
24. The tangible, non-transitory computer-readable media of claim 23, wherein detecting an indication that the first zone player is to operate in (a) one of a control-master mode or a control-slave mode for the synchrony group and (b) one of an audio-master mode or an audio-slave mode for the synchrony group comprises detecting an indication that the first zone player is to operate in (a) the control-master mode for the synchrony group and (b) the audio-master mode for the synchrony group.
Janevski discloses this feature. *See* claim 13, *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 001-01 through 001-09 or Exhibit 001-B for the reasons discussed herein and in Defendant's cover pleading.
25. The tangible, non-transitory computer-readable media of claim 24, wherein the obtained audio information comprises a beginning of the obtained audio information, and wherein the playback timing further comprises a future time relative to the reference clock time that denotes a time at which at least the first and second zone players are to initiate synchronous playback at the beginning of the obtained audio information.
Janevski discloses this feature. *See* claim 14, *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 001-01 through 001-09 or Exhibit 001-B for the reasons discussed herein and in Defendant's cover pleading.

Exemplary Disclosures
28. The tangible, non-transitory computer-readable media of claim 23, wherein beginning to operate in the synchrony group in accordance with the indication comprises either (a) transitioning from operating in the audio-master mode to operating in the audio-slave mode or (b) transitioning from operating in the audio-slave mode to operating in the audio-master mode.
Janevski discloses this feature. *See* claim 17, *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 001-01 through 001-09 or Exhibit 001-B for the reasons discussed herein and in Defendant's cover pleading.
29. The tangible, non-transitory computer-readable media of claim 23, wherein the first control information identifies particular audio content to be played back by the synchrony group that is available at an audio source outside of the at least one data network, and wherein causing the at least one playback action to be applied in the synchrony group comprises causing a zone player operating in the audio-master mode to obtain audio information that is representative of the particular audio content.
Janevski discloses this feature. *See* claim 18, *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 001-01 through 001-09 or Exhibit 001-B for the reasons discussed herein and in Defendant's cover pleading.
30. The tangible, non-transitory computer-readable media of claim 23, wherein an individual future time relative to the reference clock time comprise at least one first future time that is determined based on a local clock of a zone player other than the first zone player.
Janevski discloses this feature. *See* claim 19, *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

Exemplary Disclosures
the references cited for this limitation in Exhibits 001-01 through 001-09 or Exhibit 001-B for the reasons discussed herein and in Defendant's cover pleading.
31. The tangible, non-transitory computer-readable media of claim 23, wherein the at least one an individual future time relative to the reference clock time comprise at least one first future time that is determined based on a local clock of the first zone player.
Janevski discloses this feature. *See* claim 20, *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 001-01 through 001-09 or Exhibit 001-B for the reasons discussed herein and in Defendant's cover pleading.
32. The tangible, non-transitory computer-readable media of claim 23, wherein the second control information comprises information indicative of a volume adjustment, and wherein performing one or more playback actions in accordance with the second control information comprises adjusting a playback volume of the first zone player.
Janevski discloses this feature. *See* claim 21, *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 001-01 through 001-09 or Exhibit 001-B for the reasons discussed herein and in Defendant's cover pleading.
33. The tangible, non-transitory computer-readable media of claim 23, wherein the playback timing information that is received while operating in the audio-slave mode comprises at least one future time at which at least the first and second zone players are to engage in synchronous playback of a corresponding portion of the received audio information, and wherein operating in the audio-slave mode to engage in synchronous playback of the received audio information with at least the second zone player comprises: **updating the at least one future time to account for a differential between the local clock time of the first zone player and a local clock time of another zone player; and** **when the local clock time of the first zone player reaches the updated at least one future time, engaging in synchronous playback of the corresponding portion of the received audio information with at least the second zone player.**

Exemplary Disclosures
Janevski discloses this feature. *See* claim 22, *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 001-01 through 001-09 or Exhibit 001-B for the reasons discussed herein and in Defendant's cover pleading.