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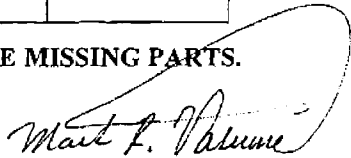
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UNITED STATES PATENT APPLICATION

FOR

SYSTEMS AND METHODS TO MODIFY PLAYOUT OR PLAYBACK

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SYSTEMS AND METHODS TO MODIFY PLAYOUT OR PLAYBACK

FIELD

[0001] Embodiments relate generally to the technical field of communications and more specifically to systems and methods to modify playout or playback of primary content.

BACKGROUND

[0002] Many receiving devices such as personal video recorders (PVRs) or digital video recorders (DVRs) may provide support for trick mode requests that enable a user to fast forward or rewind content (e.g. primary content). For example, a user who has recorded a movie on a PVR may fast forward through a scene while playing the movie. In response to the request, the PVR may render the movie to a display device at an accelerated speed. Two disadvantages may be identified in processing the users request to fast forward. First, the content played out in response to the fast forward request is the *same* content, nevertheless played at an accelerated speed. Second, the content played out in response to the fast forward request may appear jerky and reproduce poorly making identification of scenes difficult.

BRIEF DESCRIPTION OF DRAWINGS

[0003] Embodiments are illustrated by way of example and not limitation in the figures of the accompanying drawings, in which like references indicate similar elements and in which:

[0004] **Figure 1** is a block diagram illustrating a system, according to an example embodiment, to modify playout of primary content;

[0005] **Figure 2** is a block diagram illustrating a database, according to an example embodiment;

[0006] **Figure 3** is a block diagram illustrating example embodiments of entertainment secondary information, according to an example embodiment;

[0007] **Figure 4** is a block diagram illustrating example embodiments of advertisement secondary information;

[0008] Figure 5 is a block diagram illustrating frames and packets, according to an example embodiment;

[0009] Figure 6 is a flowchart illustrating a method, according to an example embodiment;

[0010] Figure 7 is a flowchart illustrating a method, according to an example embodiment, to identify secondary information based on a trick mode request;

[0011] Figure 8 is a flowchart illustrating a method, according to an example embodiment;

[0012] Figure 9 is a block diagram illustrating a system, according to an example embodiment, to modify simulated primary content at a receiving device;

[0013] Figure 10 is a block diagram illustrating a database, according to an example embodiment;

[0014] Figure 11 is a flow chart illustrating a method, according to an example embodiment, to modify simulated primary content at a receiving device;

[0015] Figure 12 is a block diagram illustrating a system, according to an example embodiment;

[0016] Figure 13 is a block diagram illustrating a database, according to an example embodiment;

[0017] Figure 14 is a block diagram illustrating a database, according to an example embodiment;

[0018] Figure 15 is a block diagram illustrating a receiving device, according to an example embodiment;

[0019] Figure 16A is a block diagram illustrating a component transmission, according to an example embodiment;

[0020] Figure 16B is a block diagram illustrating a component transmission, according to an example embodiment;

[0021] Figure 16C is a block diagram illustrating a component transmission, according to an example embodiment;

[0022] Figure 16D is a block diagram illustrating a transmission, according to an example embodiment;

[0023] Figure 17 is a block diagram illustrating streams associated with a channel, according to an example embodiment;

[0024] **Figure 18** is a block diagram illustrating the packet, according to an example embodiment;

[0025] **Figure 19** is a block diagram illustrating a secondary information table, according to an example embodiment;

[0026] **Figure 20** is a block diagram illustrating primary content and secondary information communicated in the video stream and the audio stream of a single channel, according to an example embodiment;

[0027] **Figure 21** is a block diagram illustrating primary content communicated in a first channel and secondary information communicated in a second channel, according to an example embodiment;

[0028] **Figure 22** is a block diagram illustrating the primary content communicated in a video stream and an audio stream of a channel and the secondary information communicated in the metadata stream of the same channel, according to an example embodiment;

[0029] **Figure 23** is a block diagram illustrating end of primary content markers, according to an example embodiment;

[0030] **Figure 24** is flowchart illustrating a method, according to an example embodiment, to modify playback of primary content at a receiving device;

[0031] **Figure 25** is a flow chart illustrating a method, according to an example embodiment, to communicate a transmission that facilitates modification of playback of primary content at a receiving device;

[0032] **Figures 26** is a diagram illustrating a user interface, according to an example embodiment;

[0033] **Figure 27** is a block diagram of a machine, according to an example embodiment, including instructions to perform any one or more of the methodologies described herein.

DETAILED DESCRIPTION

[0034] In the following description, for purposes of explanation, numerous specific details are set forth in order to provide a thorough understanding of example embodiments of the present invention. It will be evident, however, to one skilled in the art that the present invention may be practiced without these specific details.

[0035] Embodiments described below use one of two approaches to respond to a trick mode request (e.g., fast forward, rewind, skip request). First, a trick mode request may be responded to by associating primary content to secondary content and playing out the secondary content on a receiving device, the secondary content not being derived from the primary content. For example, a user viewing a movie (e.g., primary content) may select a fast forward button that causes fast forwarding of the movie; however, instead of viewing the movie at an accelerated speed, the user may view and/or hear secondary content. Taking this approach, the author of the secondary content is empowered with complete editorial control over the secondary content. Accordingly, the author may create secondary content of the same subject matter as the primary content or create secondary content of a different subject matter altogether. Further, the author may create secondary content of the same medium (e.g., audio and/or video) and presentation (e.g., full motion and/or slide show) of the primary content or create secondary content of a different medium (e.g., audio and/or video) and presentation (e.g., full motion and/or slide show). In addition, the author of the primary content need not be the author of the secondary content or be legally or otherwise related to the author of the secondary content.

[0036] Second, a trick mode request may be responded to by associating primary content to secondary content and playing out the secondary content on a receiving device, the secondary content being derived from the primary content but played at a normal speed for the secondary content. Taking this approach, the author of the secondary content is empowered with limited editorial control over the secondary content because the secondary content is derived from the primary content. For example, the derivative secondary content may include selected samples (e.g., audio and/or visual; motion and/or slide show) from the associated primary content. Further, the secondary content may be played at a normal speed for the secondary content thereby eliminating the jerkiness and poor reproduction normally associated with rendering primary content that is fast forwarded or rewound.

Definitions

[0037] *Primary Content* in this document is intended to include content that may be played on a receiving device or interacted with on a receiving device.

Primary content may include but is not limited to entertainment content and advertisement content. Further, primary content may include video content and/or audio content and/or associated metadata.

[0038] *Secondary Content* in this document is intended to include content that may be substituted for primary content responsive to receipt of a trick mode request (e.g., fast forward, rewind, reverse, etc.). The secondary content may be played or interacted with on a receiving device. Further, secondary content may include video content and/or audio content and/or associated metadata.

[0039] *Secondary Information* in this document may include secondary content, information to generate secondary content or information to access secondary content.

[0040] *Derivative Secondary Content* in this document is intended to include secondary content that is generated from the associated primary content. For example, derivative secondary content may include samples (e.g., audio and/or visual) from the associated primary content.

[0041] *Non-Derivative Secondary Content* in this document is intended to include secondary content that is not generated from the associated primary content. For example, derivative secondary content does not include samples (e.g., audio and/or visual) from the associated primary content.

[0042] *Normal Speed* in this document is intended to include an instantaneous speed to render a discrete unit of content (e.g., primary content or secondary content) to an output device, the normal speed being the speed necessary to completely render the discrete unit of content from beginning to end in a predetermined play time that is associated with the content. For example, an episode of Gilligan's Island may be rendered at a receiving device at a normal speed such that the episode completes in a predetermined running time (e.g., play time) of twenty-five minutes. Play times may be published with the primary and secondary content. For example, movies may be stored on media and labeled with the play time of the movie. A normal speed may be applicable to advancing the discrete unit of content in forward or reverse directions.

[0043] *Accelerated Speed* in this document is intended to include an instantaneous speed to render a discrete unit of content to an output device, the accelerated speed being any speed greater than the normal speed associated with

the discrete unit of content. An accelerated speed may be applicable to advancing the discrete unit of content in forward or reverse directions.

Point to Point Communications

[0044] This section describes aspects of the present disclosure that may be embodied using point to point communications. For example, point to point communications may be embodied as a receiving device that requests a video on demand asset from a video on demand server.

[0045] According to a first example aspect of the present disclosure a request for primary content may be received at a system. In response, the system may communicate the primary content to a receiving device that may render the primary content to an output device at a normal speed of the primary content. Also, in response, the system may associate primary content to secondary information that is communicated to a receiving device. Next, the receiving device may receive a request to render the primary content at the receiving device at an accelerated speed of the primary content (e.g., fast forward, rewind). In response, the receiving device may use the secondary information to render *secondary non-derivative content* to the output device instead of the primary content.

[0046] According to a second example aspect of the present disclosure processing is substantially similar as the first example aspect of the present disclosure except the secondary information may be used to render *secondary derivative content* instead of secondary non-derivate derivative content. Further, the receiving device may render the secondary derivative content at a *normal speed* for the secondary non-derivative content. For example, the secondary non-derivative content may include a full motion recording of selected scenes from the primary content.

[0047] Other embodiments of the first and second aspects may include the primary content being stored to a storage device at the receiving device before rendering to the output device, the secondary content being already generated at the time of the trick mode request, and the secondary content to be generated at the time of the trick mode request.

[0048] According to a third example aspect of the present disclosure a system receives a request for primary content. In response to the request, the system

may communicate the primary content to a receiving device that renders the primary content to an output device at a normal speed of the primary content. Next, the system may receive a request from the receiving device to communicate the primary content for rendering at the output device at the receiving device at an accelerated speed of the primary content (e.g., fast forward, rewind). In response, the system may associate the primary content to *secondary non-derivative content* and communicate the secondary non-derivative content to the receiving device. Next, the receiving device may render the secondary non-derivative content to the output device.

[0049] According to a fourth example aspect of the present disclosure processing is substantially similar as the third example aspect of the present disclosure except the *secondary derivative content* may be utilized instead of secondary non-derivate derivative content. Further, the receiving device may render the *secondary derivative content* at a *normal speed* for the secondary derivative content.

[0050] Other embodiments of the third and fourth aspects may include the primary content being stored to a storage device at the receiving device before rendering to the output device, the secondary content being already generated at the time of the trick mode request, and the secondary content to be generated at the time of the trick mode request.

[0051] According to a fourth example aspect of the present disclosure a receiving device may receive a request for primary content. In response, the receiving device may render the primary content to an output device at the receiving device at a normal speed for the primary content. Next, the receiving device may receive a request to render the primary content to the output device at an accelerated speed for the primary content (e.g., fast forward, rewind). Next, the receiving device may receive a simulated primary content at the receiving device for render to the output device at the receiving device so as to simulate render of the primary content to the output device at the receiving device at an accelerated speed (e.g., fast forward, rewind). Next, the receiving device may generate *secondary derivative content* based on the simulated primary content. Finally, the receiving device may render the *secondary derivative content* to the output device instead of the simulated primary content. Further, the receiving

device may render the secondary derivative content at a *normal speed* for the secondary derivative content.

Point to Multi-Point Communications

[0052] This section describes aspects of the present disclosure that may be embodied using point to multi-point communications. For example, point to multi-point communications may be embodied using an insertion system that transmits an Internet Protocol (IP) transport streams in Moving Picture Experts Group – two (MPEG-2) compression formats to multiple receiving devices (e.g., settop boxes).

[0053] According to a fifth example aspect of the present disclosure a receiving device receives a transmission that includes primary content and a secondary information identifier. The receiving device stores the transmission on a local storage device (e.g. Pause). Next, the receiving device may retrieve the transmission from the local storage device to render the primary content to an output device at the receiving device at a normal speed for the primary content (e.g., Play). Next, the receiving device may receive a request to render the primary content to an output device at the receiving device at an accelerated speed of the primary content (e.g., Fast forward, rewind). Next, the receiving device may associate the primary content to *secondary non-derivative content* based on the secondary information identifier. Finally, the receiving device may render the *secondary non-derivative content* to the receiving device.

[0054] According to a sixth example aspect of the present disclosure processing is substantially similar as the fifth example aspect of the present disclosure except the *secondary derivative content* may be utilized instead of secondary non-derivate derivative content. Further, the receiving device may render the secondary derivative content at a *normal speed* for the secondary *non-derivative content*.

[0055] Other embodiments of the fifth and sixth aspects may include the secondary content being already generated at the time of the trick mode request, the secondary content being generated responsive to the trick mode request, and the secondary content being retrieved from remote storage rather than local storage.

[0056] According to a seventh example aspect of the present disclosures a system generates a transmission that includes primary content and a secondary information identifier. Next, the system communicates the transmission to a receiving device that may process the transmission according the fifth aspect described above.

[0057] According to an eight example aspect of the present disclosures a system generates a transmission that includes primary content and a secondary information identifier. Next, the system communicates the transmission to a receiving device that may process the transmission according the sixth aspect described above.

[0058] **Figure 1** is a block diagram illustrating a system 10, according to an example embodiment. The system 10 is shown to include a receiving device 12, a video on demand system 14, and a network 16. The receiving device 12 may, for example, include a set top box (STB), a personal computer, an iPod, a personal video recorder (PVR) (e.g., analog or digital input), a personal digital recorder (PDR) (e.g., analog or digital input), a mobile phone, a portable media player, a game console or any other device capable of playing video and/or audio content. The receiving device 12 is shown to be coupled to an output device 18 and a database 22. In an example embodiment, the receiving device 12 may be operated or controlled with control buttons 19 or a remote control 20. The output device 18 may include a sound device 24 and a display device 26, however, it will be appreciated by those skilled in the art that the output device 18 may also include a machine device to communicate machine interface information (e.g., SGML) to a machine (e.g., client, server, peer to peer). The network 16 may be any network capable of communicating video and/or audio and may include the Internet, closed IP networks such as DSL or FTTH, digital broadcast satellite, cable, digital, terrestrial, analog and digital (satellite) radio, etc. and/or hybrid solutions combining one or more networking technologies.

[0059] The video on demand system 14 is shown to include a streaming server 28 a live feed 29, and a database 30. The database 30 that may be a source of prerecorded primary content 32 and secondary information 34 and the live feed 29 may be a source of live primary content 32 and live secondary information 34. The primary content 32 may be played on the output device 18 at the receiving device 12. The secondary information 34 may include entertainment

secondary information and advertisement secondary information. The secondary information 34 may further include secondary content 35 that also may be played on the output device 18 at the receiving device 12. Other embodiments may include secondary information 34 that may be used to generate secondary content 35, as described further below.

[0060] The streaming server 28 includes a request module 36 and a communication module 38. The request module 36 may receive requests from the receiving device 12. For example, the request module 36 may receive a request to play primary content 32, a request to fast forward primary content 32, a request to rewind primary content 32, and a request to pause primary content 32. In one example embodiment, the streaming server 28 and the receiving device 12 may utilize the real time streaming protocol (RTSP) to communicate. In another example embodiment the streaming server 28 and the receiving device 12 may utilize the digital storage media command and control protocol (DSM-CC) to communicate.

[0061] The communication module 38 may respond to requests received by the receiving module 218. For example, the communication module 38 may respond by communicating primary content 32 to the receiving device 12, communicating a secondary information identifier to the receiving device 12, or communicating secondary content 35 to the receiving device 12.

[0062] While the system 10 shown in Figure 1 employs a client-server architecture, the present disclosure is of course not limited to such an architecture, and could equally well find application in a distributed, or peer-to-peer, architecture system. The request module 36 and communication module 38 may also be implemented as standalone software programs, which do not necessarily have networking capabilities.

[0063] Figure 2 is a block diagram illustrating a database 30, according to an example embodiment. The database 30 is shown to include an entertainment asset table 40, and advertisement asset table 42, an entertainment secondary information table 48, and an advertisement secondary information table 50. The entertainment asset table 40 includes primary content 32 in the form of entertainment assets 44 (e.g., video on demand assets). The entertainment asset 44 may be embodied as an audio/video asset such as a movie, television program such as a documentary, a biography, a cartoon, a program, music, or music video

or an audio asset such as music track, audio interview or news program or any other form of entertainment that may be requested from the receiving device 12. A particular entertainment asset 44 may be accessed in the entertainment asset table 40 with an entertainment asset identifier.

[0064] The advertisement asset table 42 includes primary content 32 in the form of advertisement assets 46 (e.g., video on demand assets). For example, the advertisement asset 46 may be embodied as a commercial, a public service announcement, an infomercial or any other form of advertisement. A particular advertisement asset 46 may be accessed in the advertisement asset table 42 with an advertisement asset identifier.

[0065] The entertainment secondary information table 48 includes secondary information 34 that includes secondary content 35 that may be embodied as an entertainment recording 52. For example, the entertainment recording 52 may include key scenes from a movie that may be presented in full motion with sound thereby enabling the user to easily identify where the user wishes to resume play. The entertainment secondary information table 48 may include multiple entertainment recordings 52 that respectively correspond to entertainment assets 44 in the entertainment asset table 40. Accordingly, a specific entertainment asset 44 may be associated to a corresponding secondary information 34 (e.g., entertainment recording 52) in the entertainment secondary information table 48.

[0066] The advertisement secondary information table 50 includes secondary information 34 in the form of secondary content 35 the may be embodied as an advertisement recording 54. For example, the advertisement recording 54 may include an abbreviated form of the full length advertisement asset 46. The advertisement secondary information table 50 may include multiple advertisement recordings 54 that respectively correspond to advertisement assets 46 in the advertisement asset table 42. Accordingly, a specific advertisement asset 46 may be associated to a corresponding secondary information 34 (e.g., advertisement recording 54) in the advertisement secondary information table 50.

[0067] The entertainment recordings 52 and the advertisement recordings 54 are respectively shown to include six versions that correspond to types of trick mode requests to fast forward or reverse (e.g., rewind) primary content 32.

Further the trick mode may specify an accelerated speed to fast forward or rewind the primary content 32. For example, the request to fast forward or rewind may be twice-times (e.g., 2X), four-times (e.g., 4X) and six-times (e.g., 6X) of the normal speed at which the primary content 32 is rendered to the output device 18. Other example embodiments may include additional or fewer versions.

[0068] The various versions may correspond to secondary content 35 that has play times of different duration. For example, secondary content 35 corresponding to twice-times (e.g., 2X), a four-times (e.g., 4X), and six-times (e.g., 6X) may have play times of 10, 5, and 2 seconds, respectively. Further, it will be appreciated by a person having ordinary skill in the art that the above described secondary content 35 may be designed to be played at normal speed or at any speed within a range of speeds around the normal speed (e.g., accelerated speeds) to achieve a high quality play out.

[0069] In some embodiments, the primary content 32 and secondary content 35 may be accompanied with an interactive application that may result in a presentation to an end user that enables interaction with the user. For example, an entertainment asset 44 in the form of an episode of “American Idol” may include an interactive application that may cause a pop-up that enables an end user to cast a vote. The episode of “American Idol” may further be interleaved with advertisements assets 46 that may enable the voting to continue while the advertisement asset 46 is playing. Further, the entertainment asset 44 and the advertisement recording 54 may be respectively associated with secondary content 35 (e.g., an entertainment recording 52 and an advertisement recording 54) that may also include interactive applications that may also result in a presentation to an end user that has an interactive quality. For example, an entertainment recording 52 associated with the episode of “American Idol” may include an interactive application that causes a pop-up that presents a current tally of the previously described vote.

[0070] **Figure 3** is a block diagram illustrating example embodiments of entertainment secondary information 37. The entertainment secondary information 37 may include secondary content 35, secondary metadata 58 or a secondary application 60.

[0071] The secondary content 56 may be immediately rendered by the receiving device 12 to the output device 18 and may be embodied as the previously described entertainment recording 52 or an entertainment slide show 62. The entertainment slide show 62 may include one or more still images and sound that be rendered to the output device 18 at the receiving device 12. The still images may have video effects applied to them, including but not limited to fade-ins and fade-outs dissolves, splits, wipes, etc.

[0072] The secondary content 35 may include derivative secondary content and non-derivative secondary content. For example, the derivative secondary content may include samples (e.g., audio and/or visual) from the associated primary content. In contrast, the non-derivative secondary content does not include samples (e.g., audio and/or visual) from the associated primary content.

[0073] The secondary metadata 58 may be utilized to generate secondary content 35 (e.g., an entertainment recording 52 or an entertainment slide show 62). The secondary metadata 58 may be embodied as entertainment recording metadata 64 and an entertainment slide show metadata 66. The entertainment recording metadata 64 may be utilized by the communication module 38 or the receiving device 12 to generate the entertainment recording 52. In addition, the entertainment slide show metadata 66 may be utilized by the communication module 38 or the receiving device 12 to generate the entertainment slide show 62. For example, the communication module 38 or the receiving device 12 may utilize the metadata 72, 74 to identify and collect samples (e.g., audio, visual) from the associated primary content 32.

[0074] The secondary application 60 may be an application that may be executed by the communication module 38 or the receiving device 12 to generate secondary content 56. For example, the secondary application 60 may include an entertainment application 68 that may be executed by communication module 38 or the receiving device 12 to generate an entertainment recording 52 or an entertainment slide show 62.

[0075] The secondary content 35, secondary metadata 58, and the secondary application 60 may be prerecorded and stored on the database 30. Further, the secondary content 35 may be live (e.g., sporting events, election results, etc.) and communicated to the streaming server 28 from the live feed 29. Accordingly, the secondary information 34 received from the live feed 302 may include an

entertainment recording 52 (e.g. live content), an entertainment slide show 62 (e.g. live content), an advertisement recording 54 (e.g. live content), and an advertisement slide show (e.g. live content).

[0076] Figure 4 is a block diagram illustrating example embodiments of advertisement secondary information 39. The advertisement secondary information 39 may include secondary content 35, secondary metadata 58, or a secondary application 60.

[0077] The secondary content 56 may be immediately rendered by the receiving device 12 to the output device 18. The secondary content 56 may be embodied as the previously described advertisement recording 54 or an advertisement slide show 70. The advertisement slide show 70 may include one or more still images and sound that may be rendered to the output device 18 at the receiving device 12. The still images may have video effects applied to them, including but not limited to fade-ins and fade-outs dissolves, splits, wipes, etc.

[0078] The secondary content 35 may include derivative secondary content and non-derivative secondary content. For example, derivative secondary content may include samples (e.g., audio and/or visual) from the associated primary content. In contrast, non-derivative secondary content does not include samples (e.g., audio and/or visual) from the associated primary content 32.

[0079] The secondary metadata 58 may be utilized to generate secondary content 35 (e.g., advertisement recording 54 or an advertisement slide show 70). The secondary metadata 58 may be embodied as advertisement recording metadata 72 and an advertisement slide show metadata 66. The advertisement recording metadata 72 may be utilized by the communication module 38 or the receiving device 12 to generate secondary content 35 in the form of the advertisement recording 54. In addition, the advertisement slide show metadata 74 may be utilized by the communication module 38 or the receiving device 12 to generate secondary content 35 in the form of the advertisement slide show 70. For example, the communication module 38 or the receiving device 12 may utilize the metadata 72, 74 to identify and collect samples (e.g., audio, visual) from the associated primary content 32.

[0080] The secondary application 60 may be executed by the communication module 38 or the receiving device 12 to generate secondary content 56. For example, the secondary application 60 may include an advertisement application

68 that may be executed by communication module 38 or the receiving device 12 to generate an advertisement recording 54 or an advertisement slide show 70.

[0081] Figure 5 is a block diagram illustrating frames 80 and packets 82 according to an example embodiment. In an example embodiment the primary content 32 and the secondary information 34 may be stored as frames 80 on the database 30. In another example embodiment the primary content 32 and the secondary information 34 may be stored as packets 82 on the database 30.

[0082] Moving from left to right, analog image data and analog sound data may be encoded by an encoder to produce the frames 80. The frames 80 include reference frames 86, reference frame changes 84, and a metadata frame 87. The reference frame 86 may contain reference frame data that is sufficient to completely render an image on the display device 26. In contrast, the reference frame change 84 may contain reference frame change data representing the differences between two successive frames 80. The reference frame change 84 thereby enables bandwidth savings proportional to the similarity between the successive frames 80 (e.g., redundant information is not communicated). The metadata frame 87 contains metadata frame data that may be used to synchronize the corresponding image and sound data.

[0083] The reference frames 86, reference frame changes 84, and metadata frames 87 may further be packetized by a multiplexer into packets 82. The packets 82 are shown to include video information, audio information and metadata.

[0084] Figure 6 is a flowchart illustrating a method 100, according to an example embodiment. Illustrated on the right are operations performed on the receiving device 12 and illustrated on the left are operations performed on the streaming server 28. The method 100 commences at the receiving device 12, at operation 102, with the user requesting an entertainment asset 44. For example, the user may use a remote control 20 to select a video on demand asset from a menu that is displayed on the display device 26. In response to the user's request, the receiving device 12 may communicate the request over the network 16 to the streaming server 28. In an example embodiment the receiving device 12 and the streaming server may utilize the real time streaming protocol (RTSP).

[0085] At operation 104, at the streaming server 28, the request module 36 receives the request to play the video on demand asset. For example, the request

may include a primary content identifier that may be used to access the appropriate entry in the entertainment asset table 40. At operation 106, the communication module 38 communicates (e.g., streams, playout) the entertainment asset 44 over the network 16 to the receiving device 12.

[0086] At operation 108 the receiving device 12 receives and renders the entertainment asset 44 to the display device 26 at the normal speed for the entertainment asset 44 until a scheduled advertisement.

[0087] At operation 110, at the streaming server 28, the communication module 38 communicates primary content 32 embodied as an advertisement asset 46.

[0088] At operation 112, the receiving device 12 receives and renders the advertisement asset 46 at normal speed on the display device 26 and the sound device 24. At operation 114, the user may decide not to watch the advertisement and select the fast forward button on the remote control 20 to accelerate the forward speed of the advertisement. Responsive to the request, the receiving device 12 may communicate the fast forward trick mode request to the streaming server 28. For example, the user may request fast forwarding at twice the normal speed (e.g., 2X FF) of the advertisement asset 46 by pressing a fast forward button on the remote control 20 once.

[0089] At operation 116, at the streaming server 28, the request module 36 receives the trick mode request from the receiving device 12. For example, the trick mode request may include a primary content identifier, a direction identifier (e.g., forward or reverse) and a speed identifier (e.g., 2X, 4X, 6X, etc.).

[0090] At operation 118, the communication module 38 associates primary content 32 to secondary content 35 in the form of the advertisement asset 46 to the corresponding secondary content 35 in the form of an advertisement recording 54 responsive to the request. For example, the communication module 38 may associate the advertisement asset 46 to a version that is twice the normal speed (e.g., 2X FF) of the advertisement recording 54. In addition, the communication module 38 may initiate fast forwarding of the advertisement asset 46 at twice the normal speed without streaming the advertisement asset 46 to the receiving device 12. At operation 120, the communication module 38 may communicate (e.g., playout, stream, etc.) secondary content 35 embodied as the advertisement recording 54 to the receiving device 12.

[0091] At operation 122, the receiving device 12 may receive and render the advertisement recording 54 (e.g., derivative secondary content) at normal speed to the output device 18 until the advertisement recording 54 ends at operation 124. At operation 126 the user requests the play mode by pressing the play button on the remote control 20 and the receiving device 12 communicates the request to the streaming server 28.

[0092] At operation 128, at the streaming server 28, the request module 36 receives the request and at operation 130 the communication module 38 communicates the entertainment asset 44 to the receiving device 12.

[0093] At operation 132 the receiving device 12 receives and renders the entertainment asset 44 to the display device 26 and the sound device 24 at a normal speed for the advertisement asset 44.

Other Examples – Offsets into Primary and Secondary Content

[0094] The user in the above example entered a fast forward trick mode request at the beginning of a discrete unit of primary content 32 (e.g., advertisement asset 46) and the communication module 38 responded by causing the rendering of a discrete unit of secondary content 35 (e.g., advertisement recording 54) from the beginning of the discrete unit of secondary content 35 (e.g., advertisement recording 54). It will be appreciated by one skilled in the art that other examples may include the user entering a fast forward trick mode request at some offset into the primary content 32 and the communication module 38 responding by advancing to a corresponding offset from the beginning of the secondary content 35 (e.g., associated advertisement recording 54) and commencing the rendering of the secondary content 35 (e.g., advertisement recording 54) from the identified offset. For example, a user that enters a fast forward trick mode request in the middle of an advertisement asset 46 may cause the communication module 38 to begin rendering the associated advertisement recording 54 in the middle of the advertisement recording 54. In general, the author of the secondary content 35 may exercise complete editorial control over selection of the offset into the secondary content 35 from which rendering is to begin based on the offset into the primary content 32 that may be detected responsive to the trick mode request. It will further be appreciated that

the author of secondary metadata 58 and a secondary application 60 may exercise the same editorial control.

Other Examples – Fast Forwarding Past the End of Secondary Content

[0095] A user that continues to fast forward after the secondary content 35 (e.g., advertisement) has ended may, in one embodiment, view primary content 32 that may be rendered at an accelerated speed.

Example Embodiments –Secondary Information

[0096] In response to the trick mode request, the communication module 38, in the above described example embodiment, communicated advertisement secondary information 39 in the form of the advertisement recording 54. It will be appreciated by one skilled in the art that other example embodiments may utilize different advertisement secondary information 39. For example, other types of advertisement secondary information 39 may include secondary metadata 58, secondary applications 60 or secondary content 35 in the form of an advertisement slide show 70.

Example Embodiment - Secondary Metadata

[0097] In response to the trick mode request, the communication module 38 may utilize advertisement recording metadata 72 or the advertisement slide show metadata 78, according to one embodiment. For example, the advertisement recording metadata 72 may be processed by the communication module 38 to generate an advertisement recording 54 and the advertisement recording metadata 72 may be processed by the communication module 38 to generate an advertisement slide show 70. In both examples, the communication module 38 may utilize the respective metadata 72, 74 to identify a subset of reference frames 86 and reference frame changes 84 in the associated advertisement asset 46 to respectively generate the advertisement recording 54 and the advertisement recording metadata 72.

Example Embodiment – Secondary Application

[0098] In response to the trick mode request, the communication module 38 may utilize a secondary application 60, according to one embodiment. For

example, the secondary application 60 may be embodied as the advertisement application 76. The advertisement application 76 may be executed by the communication module 38 to generate secondary content 35 in the form of the advertisement recording 54 or the advertisement slide show.

Other Examples – Medium and Presentation of Primary and Secondary Content

[0099] Other example may include primary content 32 and secondary content 35 that may be embodied in one or more mediums (e.g., visual, audio, kinetic, etc.), the visual medium presented as motion or still. It will be appreciated by one skilled in the art that the medium and presentation of primary content 32 does not necessarily determine the medium and presentation of secondary content 35 and that any combination of the medium and presentation of the primary content 35 may be associated to secondary content in any combination of medium and presentation. For example, primary content 32 embodied solely in audio may be associated with secondary content 35 embodied as audio and visual (e.g., motion or still). In another embodiment, secondary content 35 may include non-derivative secondary content 35 and derivative secondary content 35. For example, secondary content 35 may include video that may be derived from the corresponding primary content 32 and audio that may not be derived from the corresponding primary content 32.

Other Examples – Entertainment Assets

[00100] It will be appreciated by one skilled in the art that primary content 32 may also be embodied in the form of entertainment assets 46. Accordingly, the entertainment asset 46 may be associated to corresponding entertainment secondary information 37 (e.g., entertainment recording 52, entertainment slide show 62, entertainment recording metadata 64, entertainment slide show metadata 66, entertainment application 68).

Other Example – Primary Content Played From Local Storage Device

[00101] Further, it will be appreciated by one skilled in the art that the primary content 32 may not be immediately played on the output device 18 but rather stored to a local storage device (e.g., memory, database 22) for later or delayed playback.

Other Examples – Medium and Presentation of Primary and Secondary Content

[00102] Other example may include primary content 32 and secondary content 35 that may be embodied in one or more mediums (e.g., visual, audio, kinetic, etc.), the visual medium presented as motion or still. It will be appreciated by one skilled in the art that the medium and presentation of primary content 32 does not necessarily determine the medium and presentation of secondary content 35 and that any combination of the medium and presentation of the primary content 35 may be associated to secondary content in any combination of medium and presentation. For example, primary content 32 embodied solely in audio may be associated with secondary content 35 embodied as audio and visual (e.g., motion or still). In another embodiment, secondary content 35 may include non-derivative secondary content 35 and derivative secondary content 35. For example, secondary content 35 may include video that may be derived from the corresponding primary content 32 and audio that may not be derived from the corresponding primary content 32.

Other Example – Non-derivative Secondary Content

[00103] In response to the trick mode request, the communication module 38, in the above described example embodiment, communicated derivative secondary content (e.g., advertisement recording 54) for rendering to an output device 18 at a normal speed for the derivative secondary content. In another example, the communication module 38 may have communicated non-derivative secondary content (e.g., advertisement recording 54).

[00104] **Figure 7** is a flowchart illustrating a method 160, according to an example embodiment, to identify secondary information 34 based on a trick mode request. The method 160 commences at decision operation 162 with the communication module 38 determining the direction of the trick mode request. If the communication module 38 determines that the trick mode request is a fast forward request then a branch is made to decision operation 164. Otherwise, the communication module 38 determines the trick mode request is a rewind or reverse request and branches to decision operation 172.

[00105] At decision operation 164, the communication module 38 determines the speed of the trick mode request. If the communication module 38 determines

the trick mode request is twice-times normal speed then a branch is made to operation 166. If the communication module 38 determines the trick mode request is four-times normal speed then a branch is made to operation 168. If the communication module 38 determines speed of the trick mode request is eight-times the normal speed then a branch is made to operation 170. At operations 166, 168 and 170 the communication module 38 identifies two-times, four-times and eight-times normal fast forward versions respectively.

[00106] At decision operation 172 the communication module 38 determines the speed of the rewind or reverse trick mode request. If the speed of the rewind trick mode request is two-times, four-times, or six-times the normal speed then a branch is made to operation 174, 176 and 178 respectively.

[00107] Figure 8 is a flowchart illustrating a method 180, according to an example embodiment. Illustrated on the right are operations performed on the receiving device 12 and illustrated on the left are operations performed on the streaming server 28. The method 180 commences at the receiving device 12, at operation 181, with the user requesting an entertainment asset 44. For example, the user may use a remote control 20 to select a video on demand asset from a menu that is displayed on the display device 26. In response to the user's request, the receiving device 12 may communicate the request over the network 16 to the streaming server 28. In an example embodiment the receiving device 12 and the streaming server may utilize the real time streaming protocol (RTSP).

[00108] At operation 182, at the streaming server 28, the request module 36 receives the request to play the video on demand asset. For example, the request may include primary content identifier that may be used to access the appropriate entry in the entertainment asset table 40. At operation 183, the communication module 38 communicates (e.g., streams, playout) the entertainment asset 44 over the network 16 to the receiving device 12.

[00109] At operation 184, the receiving device 12 receives and renders the entertainment asset 44 to the display device 26 at the normal speed for the entertainment asset 44.

[00110] At operation 185, at the streaming server 28, the communication module 38 associates the primary content 32 to secondary information 34. For example, the communication module 38 may utilize the primary content

identifier to identify corresponding secondary information 34 in the entertainment secondary information table 48 (e.g., entertainment application).

[00111] At operation 186, at the streaming server 28, the communication module 38 may communicate the entertainment application 68 to the receiving device 12. For example, the communication module 38 may communicate all versions of the entertainment application 68 (e.g., 2X FF VERSION, 4X FF VERSION, 6X FF VERSION, 2X REW VERSION, 4X REW VERSION, 6X REW VERSION) to the receiving device 12.

[00112] At operation 187, the receiving device 12 receives and stores all versions of the entertainment application 68 on the database 22.

[00113] At operation 188, the user may select the fast forward button on the remote control 20 to accelerate the forward speed of the entertainment asset. Responsive to the request, the receiving device 12 may communicate the fast forward trick mode request to the streaming server 28. For example, the user may request fast forwarding at twice the normal speed (e.g., 2X FF) of the advertisement asset 46 by pressing a fast forward button on the remote control 20 once.

[00114] At operation 189, at the streaming server 28, the request module 36 receives the trick mode request from the receiving device 12. For example, the trick mode request may include a primary content identifier, a direction identifier (e.g., forward or reverse) and a speed identifier (e.g., 2X, 4X, 6X, etc.).

[00115] At operation 190, at the streaming server 28, the communication module 38 stops streaming or communicating the entertainment asset 44 to the receiving device 12. At operation 191, the communication module 38 fast forwards the entertainment asset 44.

[00116] At operation 192, the receiving device 12 executes the appropriate version of the entertainment application 68 (e.g., 2X FF VERSION) to generate non-derivative secondary content in the form of an entertainment slide show 62. At operation 193, the receiving device 12 renders the entertainment slide show 62 to the output device 18.

[00117] At operation 194 the user requests the play mode by pressing the play button on the remote control 20. In response, at operation 195, the receiving device 12 stops rendering the entertainment slide show 62 to the output device 18 and communicates a play request to the streaming server 28.

[00118] At operation 196, at the streaming server 28, the request module 36 receives the request to play the entertainment asset 44. At operation 196, the communication module 38 stops fast forwarding the entertainment asset 44 and communicates (e.g., streams, playout) the entertainment asset 44 over the network 16 to the receiving device 12.

[00119] At operation 198, the receiving device 12 receives and renders the entertainment asset 44 to the output device 18 at a normal speed for the advertisement asset 44.

Other Example Embodiments

[00120] In response to the trick mode request, the receiving device 12, in the above described example embodiment, utilized entertainment secondary information 37 in the form of an entertainment application 68 to generate an entertainment slide show 62. It will be appreciated by one skilled in the art that other example embodiments may utilize different entertainment secondary information 37. For example, other types of entertainment secondary information 37 may include secondary content 35 and a secondary application 60 that may generate an entertainment recording 52.

Other Example Embodiments – Secondary Content

[00121] In response to the trick mode request, the communication module 38, in other example embodiments, may render secondary content 35. For example, the secondary content 35 may include an entertainment recording 52 or an entertainment slide show 62.

Other Examples – Advertisement Assets

[00122] Further, it will be appreciated by one skilled in the art that primary content 32 may also include an advertisement asset 46. Accordingly, the advertisement asset 46 may be associated to corresponding advertisement secondary information 39 (e.g., advertisement recording 54, advertisement slide show 70, advertisement application 76).

Other Examples – Offsets into Primary and Secondary Content

[00123] As previously described, in like manner, the author of secondary content 35 may exercise complete editorial control over selection of the offset into the secondary content 35 from which rendering is to begin based on the offset into the primary content 32 that may be detected responsive to the trick mode request. It will further be appreciated that the author of secondary metadata 58 and a secondary application 60 may exercise the same editorial control.

Other Example Embodiments – Primary Content Played From Local Storage Device

[00124] Further, it will be appreciated by one skilled in the art that the primary content 32 may not be immediately played on the output device 18 but rather stored to a local storage device (e.g., memory, database 22) for later or delayed playback.

Other Examples – Medium and Presentation of Primary and Secondary Content

[00125] Other examples may include primary content 32 and secondary content 35 that may be embodied in one or more mediums (e.g., visual, audio, kinetic, etc.), the visual medium presented as motion or still. It will be appreciated by one skilled in the art that the medium and presentation of primary content 32 does not necessarily determine the medium and presentation of secondary content 35 and that any combination of the medium and presentation of the primary content 35 may be associated to secondary content in any combination of medium and presentation. For example, primary content 32 embodied solely in audio may be associated with secondary content 35 embodied as audio and visual (e.g., motion or still). In another embodiment, secondary content 35 may include non-derivative secondary content 35 and derivative secondary content 35. For example, secondary content 35 may include video that may be derived from the corresponding primary content 32 and audio that may not be derived from the corresponding primary content 32.

Other Example – Derivative Secondary Content

[00126] In response to the trick mode request, in the above described example embodiment, the receiving device used the entertainment application 68 to

generate non-derivative secondary content (e.g., entertainment slide show 62) for rendering to an output device 18. In another example, the receiving device 12 may have used the entertainment application 68 to generate derivative secondary content (e.g., entertainment slide show 62) for rendering to the output device 18 at a normal speed for the derivative secondary content.

Other Examples – Fast Forwarding Past the End of Secondary Content

[00127] A user that continues to fast forward after the secondary content 35 (e.g., advertisement) has ended may, in one embodiment, result in the receiving device 12 viewing corresponding primary content 32 that may be rendered at an accelerated speed. For example, the receiving device 12 may request the streaming server 28 to communicate primary content 32 that may be rendered at an accelerated speed.

[00128] Figure 9 is a block diagram illustrating a system 200, according to an example embodiment, to modify simulated primary content 238 at a receiving device 12. The system 200 is shown to include a receiving device 12, a network 16 and a video on demand system 206.

[00129] The receiving device 12 has previously been described. Further description is provided below for previously unmentioned components. The receiving device 12 may include a decoder system 208, a processor 210, a memory 212, a content communication module 216, a demultiplexer 217, an audio module 219, a video module 221, a descrambler 225, a receiving module 218, control buttons 19, an interface 222, and an interface 223, and a local storage device 309.

[00130] The processor 210 may execute instructions and move data to and from the memory 212 and the memory 226. The content communication module 216 may receive primary content 32 and/or simulated primary content 238 from the network 204 via the interface 223 and communicate the primary content 32 and simulated primary content 238 to the demultiplexer 217. Further, the content communication module 216 may utilize the simulated primary content 238 to generate the secondary content 35 in the form of a programmatically generated entertainment slide show, a programmatically generated entertainment recording, a programmatically generated advertisement slide show, or a programmatically generated advertisement recording. The receiving module 218

may receive a request from the control buttons 19 or the remote control 20. For example, the receiving module 218 may receive a request to fast forward or reverse (e.g., rewind) primary content at an accelerated speed that may be 2X, 4X, or 6X normal speed. The demultiplexer 217 may demultiplex the primary content 32 and the simulated primary content 238 into audio, video, and metadata streams that may be respectively communicated to the audio module 219, the video module 221 and the descrambler 225. The metadata stream may include descrambling information that includes conditional access decryption keys that may be used by the descrambler 225 to descramble or decrypt the audio and video streams. Other embodiments may not include the descrambler 225. The audio module 219 may process the audio and communicate the audio to the memory 226. Similarly, the video module 221 may process the video and communicate the video to the memory 226.

[00131] The decoder system 208 is shown to include a processor 224, a memory 226, a decoder 230 and a render module 234. The processor 224 may be used for executing instructions and moving data. For example, the processor 224 may be used to move the primary content 32, the simulated primary content 238 or other data from the memory 226 to the decoder 230. The decoder 230 may decode the packets/frames into image and sound data. The render module 234 may render the sound data to the sound device 24 and render image data to the display device 26.

[00132] The local storage device 309 may include a circular buffer that includes both the memory 226 and the database 22. The circular buffer may be utilized by the receiving device 12 to store the primary content 32 and/or simulated primary content 238. For example, a user may be watching a movie and select a pause button on the remote control 20 to answer a telephone call. Responsive to selection of the pause button, the movie may be stored in the circular buffer. Subsequent to completing the telephone call the user may select the play button on the remote control 20 to prompt the receiving device 12 to resume rendering of the movie to the output device 18 by retrieving the movie from the circular buffer. In addition, the local storage device 309 may include a file structure for storing and retrieving the primary content 32 and/or simulated primary content 238.

[00133] The video on demand system 206 is shown to include a streaming server 28 and a database 235. The streaming server 28 responds to requests for primary content 32 by reading primary content 32 from the database 235 and communicating the primary content 32 over the network 16 to the receiving device 12. Further, the streaming server 28 may respond to a trick mode request by associating the primary content 32 to simulated primary content 238 and communicating (e.g., stream, playout) the simulated primary content 238 over the network 14 to the receiving device 12.

[00134] Generally speaking, a user may operate the control buttons 19 or the remote control 20 to fast forward or rewind (e.g., reverse) the primary content 32 that is presently rendered on the output device 18. In response to receiving the trick mode request, the receiving device 12 may communicate the trick mode request over the network 204 to the streaming server 28. The streaming server 28 may receive the primary content 32 and associate the primary content 32 to simulated primary content 238. Next, the streaming server 28 may communicate the simulated primary content 238 to the receiving device 12. At the receiving device 12, the content communication module 216 may receive the simulated primary content 238 and utilize the simulated primer content 238 to generate derivative secondary content. For example, the generated derivative secondary content may be embodied as a programmatically generated entertainment slide show. Finally, the programmatically generated entertainment slide show may be rendered to the output device 18 at a normal speed.

[00135] While the system 10 shown in **Figure 9** employs a client-server architecture, the present disclosure is of course not limited to such an architecture, and could equally well find application in a distributed, or peer-to-peer, architecture system. The content communication module 216 and the receiving module 218 may also be implemented as standalone software programs, which do not necessarily have networking capabilities.

[00136] **Figure 10** is a block diagram illustrating a database 235, according to an example embodiment. The database 235 includes an entertainment asset table 40 as previously described, an advertisement asset table 42 as previously described, an entertainment simulated primary content table 236, and an advertisement simulated primary content table 241.

[00137] The entertainment simulated primary content table 236 contains simulated primary content 238 in the form of accelerated speed entertainment assets 240. Each accelerated speed entertainment assets 240 may be associated with a corresponding entertainment asset 44. For example, the streaming server 28 may associate the entertainment asset 44 to the appropriate accelerated speed entertainment asset 240 responsive to receiving a trick mode request. The accelerated speed entertainment asset 240 may be a prerecorded version of the entertainment asset 44 played at an accelerated speed. In an example embodiment, the accelerated speed entertainment asset 240 may be prerecorded at different speeds and directions (e.g., 2X or 4X or 6X - Fast forward or 2X or 4X or 6X - Rewind).

[00138] The advertisement simulated primary content table 241 contains simulated primary content 238 in the form of accelerated speed advertisement assets 242. Each accelerated speed advertisement asset 242 may be associated with an advertisement asset 46. For example, the streaming server 28 may associate the advertisement asset 46 to the corresponding accelerated speed advertisement asset 242 responsive to receiving a trick mode request. The accelerated speed advertisement asset 242 may be a prerecorded version of the advertisement asset 46 played at an accelerated speed. In an example embodiment, the accelerated speed advertisement asset 242 may be prerecorded at different speeds and directions (e.g., 2X or 4X or 6X - Fast forward or 2X or 4X or 6X - Rewind).

[00139] Figure 11 is a flow chart illustrating a method 250, according to an example embodiment, to modify simulated primary content 238 at a receiving device 12. Operations performed by the receiving device 12 are illustrated on the right and operations performed by the streaming server 28 are illustrated on the left. The method 250 commences at the receiving device 12, at operation 252 where the user requests an entertainment asset 44 that may be communicated to the streaming server 28.

[00140] At operation 254, the streaming server 28 receives the request to play the entertainment asset 44 and retrieves the requested entertainment asset 44 from the database 235. For example, the request to play the entertainment asset 44 asset may include an entertainment asset identifier that may be used to access the requested entertainment asset 44 in the entertainment asset table 40. At

operation 256, the streaming server 28 communicates the entertainment asset 44 to the receiving device 12.

[00141] At operation 258, at the receiving device 12, the content communication module 216 receives the entertainment asset 44 and communicates the entertainment asset 44 to the demultiplexer 217 that demultiplexes the entertainment asset 44 into audio, video, and metadata streams that are respectively communicated to the audio module 219, the video module 221 and descrambler 225. The audio module 219, the video module 221, and the descrambler 225 process the respective streams and communicate the results to the memory 226. For example, the descrambler 225 may utilize conditional access decryption keys in the metadata to interact with the audio module 219 and the video module 221 to decrypt or descramble the video and/or the audio.

[00142] At operation 260, the decoder 23, in the decoder system 208, decodes the entertainment asset 44 and communicates the entertainment asset 44 to the render module 234. At operation 260, the render module 234 renders the entertainment asset 44 to the output device 18 including the display device 26 and the sound device 24 at normal speed.

[00143] At operation 262, at the receiving device 12, the user enters a trick mode request (e.g., Fast Forward 2X normal speed) via the remote control 20 that is received by the receiving module 218 at the receiving device 12. The receiving module 218 may communicate the trick mode request over the network 204 to the streaming server 28. In an example embodiment the trick mode request may be communicated utilizing the real time streaming protocol.

[00144] At operation 264, the streaming server 28 receives the trick mode request from the receiving device 12. At operation 265, the streaming server 28 associates the entertainment asset 44 that is currently being communicated (e.g., streamed) to the receiving device 12 to the corresponding accelerated speed entertainment asset 240 and at operation 266 the streaming server 28 communicates the accelerated speed entertainment asset 240 to the receiving device 12.

[00145] At operation 268, at the receiving device 12, the content communication module 216 receives the accelerated speed entertainment asset 240 and communicates the accelerated speed entertainment asset 240 to the demultiplexer 217 that demultiplexes the entertainment asset 44 into audio,

video, and metadata streams that are respectively communicated to the audio module 219, the video module 221 and descrambler 225. The audio module 219, the video module 221, and the descrambler 225 process the respective streams and communicate the results to the memory 226. For example, the descrambler 225 may utilize conditional access decryption keys in the metadata to interact with the audio module 219 and the video module 221 to decrypt or descramble the video and/or the audio.

[00146] At operation 270, the content communication module 216 generates secondary derivative content (e.g., programmatically generated entertainment slide show) from the accelerated speed entertainment asset 240. For example, the programmatically generated entertainment slide show may include reference frames 86 selected by the content communication module 216 from the accelerated speed entertainment asset 240 stored in the memory 226. In an example embodiment, the content communication module 216 may select reference frames by identifying different scenes in the accelerated speed entertainment asset 240. Further the content communication module 216 may add fade-ins and fade-outs. Next, the content communication module 216 communicates the programmatically generated entertainment slide show to the decoder 230 that decodes the programmatically generated entertainment slide show and communicates the programmatically generated entertainment slide show to the render module 234.

[00147] At operation 272, the render module 234 renders a programmatically generated entertainment slide show to the output device 18 at normal speed.

[00148] At operation 274, the receiving module 218 receives a play request that may be entered by the user via the remote control 20 or control buttons 19 and communicates the play request to the streaming server 28.

[00149] At operation 276, the streaming server 28 receives the request from the receiving device 12. At operation 278, the streaming server 28 may identify a location in the entertainment asset 44 based on the elapsed time from receipt of the fast forward request to receipt of the play request and may resume communicating (e.g., streaming) the entertainment asset 44 to the receiving device 12.

[00150] At operation 280, at the receiving device 12, the render module 234 renders the entertainment asset 44 to the output device 18 at normal speed.

Other Example Embodiments

[00151] The content communication module 216 in the above example embodiment generated a programmatically generated entertainment slide show, however, it will be appreciated that other example embodiments may generate a programmatically generated entertainment recording, programmatically generated advertisement slide show, and a programmatically generated advertisement recording.

Other Examples – Offsets into Primary and Secondary Content

[00152] As previously described, in like manner, the author of the content communication module 216 may exercise complete editorial control, via the communication module 216, over the selection of the offset into the simulated primary content 238 from which rendering is to begin based on the offset into the primary content 32 that may be detected responsive to the trick mode request.

[00153] Figure 12 is a block diagram illustrating a system 290, according to an example embodiment. The system 290 may be utilized to communicate a transmission that facilitates modification of playback of primary content 32 at a receiving device 12.

[00154] The system 290 includes a receiving device 12, a broadcast system 292 and a video on demand system 294. The broadcast system 292 includes an entertainment server 296 and an insertion system 298 that includes an advertisement server 304, a live feed 302 and an insertion server 308.

[00155] Broadly speaking, the insertion server 308 may receive and a component transmission 291 (e.g., Internet Protocol (IP) that includes a stream that is formatted in MPEG-2 compression format from a live feed 302, a component transmission 293 that includes a stream that is formatted in an MPEG-2 compression format from the entertainment server 296, and a component transmission 295 that includes a stream that is formatted in an MPEG-2 compression format from the advertisement server 304. The component transmission 291 that is received from the live feed 302 may include primary content 32 and secondary information 34 that is live (e.g., sporting events, election results, etc.). Accordingly, the primary content 32 received from the live feed 302 may include an entertainment asset 44 (e.g. live content) and an

advertisement asset 46 (e.g. live content). Likewise, the secondary information 34 received from the live feed 302 may include an entertainment recording 52 (e.g. live content), an entertainment slide show 62 (e.g. live content), an advertisement recording 54 (e.g. live content), and an advertisement slide show (e.g. live content).

[00156] Each of the component transmissions 291, 293, 295 may include multiple channels. Each channel may include multiple packetized elementary streams that carry audio and/or visual, and/or metadata. Other example embodiments may include component transmissions 291, 293, 295 embodied in other transport formats (e.g., IP) and compression formats (e.g., MPEG-4, VC1, etc.). The transmission from the advertisement server 304 may carry primary content 32 in the form of advertisement assets 46 and secondary information 34 relating to advertisements. The transmission from the entertainment server 296 may carry primary content 32 in the form of entertainment assets 44 and secondary information 34 relating to entertainment. Next, the insertion server 308 may utilize the component transmissions 291, 293, 295 to generate a transmission 297 that is communicated over the network 16 to the receiving device 12. Other example embodiments may include the transmission 297 embodied in other compression formats (e.g., MPEG-4, VC1) or other transport formats (e.g., Internet Protocol (IP)). The secondary information 34 may include a secondary information identifier that may be used by the receiving device 12 to associate the primary content 32 to secondary content 35 that may be played out at the output device 18 at the receiving device 12 responsive to receiving a trick mode request.

[00157] The entertainment server 296 is coupled to a database 300 that may include primary content 32 and secondary entertainment information 37 as previously described.

[00158] The advertisement server 304 is shown to be coupled to a database 306 that may include primary content 32 and advertisement secondary information 39 as previously described. The insertion server 308 is shown to include a transport module 310 and a transmission module 312. The transport module 310 may receive the component transmission 291 from the live feed 302 and the component transmission 293 from the entertainment server 296 and the component transmission 295 from the advertisement server 304. Further, the

transport module 310 may generate the transmission 297 based on the component transmission 291 from the live feed 302 and the component transmission 293 received from the entertainment server 296 and the component transmission 295 received from the advertisement server 304. The transmission module 312 may communicate the transmission 297 to the receiving device 12. [00159] The video on demand system 294 includes the streaming server 28 that is shown to be coupled to a remote storage device 316 that may include a database 317 that may include secondary information 34. The receiving device 12 may utilize the secondary information 34 received in the transmission 297 to request additional secondary information 34 that is stored on the remote storage device 316.

[00160] While the system 290 shown in **Figure 12** employs a client-server architecture between the receiving device 12 and the video on demand server 28, the present disclosure is of course not limited to such an architecture, and could equally well find application in a distributed, or peer-to-peer, architecture system.

[00161] **Figure 13** is a block diagram illustrating a database 300, according to an example embodiment. The database 300 is coupled to the entertainment server 296 and is shown to include the entertainment asset table 40 and the entertainment secondary information table 48 as previously described. The entertainment secondary information table 48 is shown to include multiple entries of entertainment recordings 52; however, it will be appreciated by a person having ordinary skill in the art that other example embodiments of the entertainment secondary information table 48 may include other forms of secondary information 34 including the entertainment slide show 62, the entertainment recording metadata 64, the entertainment slide show metadata 66, and the entertainment application 68 all as previously described.

[00162] **Figure 14** is a block diagram illustrating a database 306, according to an example embodiment. The database 306 is coupled to the advertisement server 304 and is shown to include the advertisement asset table 42 and the advertisement secondary information table 50 as previously described. The advertisement secondary information table 50 is shown to include multiple entries of advertisement recordings 54; however, it will be appreciated by a person having ordinary skill in the art that other example embodiments of the

advertisement secondary information table 50 may include other forms of secondary information 34 including the advertisement slide show 70, the advertisement recording metadata 72, the advertisement slide show metadata 74, and the advertisement application 76 all as previously described.

[00163] Figure 15 is a block diagram illustrating the receiving device 12, according to an example embodiment. The receiving device 12 has previously been described. Further description is provided below for previously unmentioned components or functions.

[00164] The receiving device 12 includes a demultiplexer 217, a local storage device 309, and a processing module 322. The demultiplexer may receive a transmission 297 from the insertion system 298, demultiplexes the transmission 297 according to channels and stores the demultiplexed transmission 297 in the local storage device 309. For example, in one embodiment, the demultiplexer 217 may utilize the audio module 219, the video module 221, and the descrambler 225 to process and store the transmission 297 in the local storage device 309. In addition, the demultiplexer 217 may identify secondary information 34 in the form of secondary content 35, secondary metadata 58, and a secondary application 60 in the demultiplexed transmission 297 and store the secondary content 35, secondary metadata 58, and a secondary application 60 as addressable files on the local storage device 309.

[00165] The local storage device 309 may include a circular buffer that includes both the memory 226 and the database 22. The circular buffer may be utilized by the receiving device 12 to store the transmission 297. For example, a user may be watching a baseball game that is broadcast live and select a pause button on the remote control 20 to answer a telephone call. Responsive to selection of the pause button, the transmission 297 may be stored in the circular buffer. Subsequent to completing the telephone call the user may select the play button on the remote control 20 to prompt the receiving device 12 to resume rendering of the baseball game to the output device 18 by retrieving the transmission 297 from the circular buffer and processing the transmission 297. In addition, the local storage device 309 may include a file structure for storing and retrieving the secondary information 34 including secondary content 56, the secondary metadata 58 and secondary applications 60. Accordingly, in an example embodiment, the local storage device 309 may be utilized to store secondary

information 34 in the form of an addressable file (e.g., accessed with a URL) or in the form of a transmission 297.

[00166] The processing module 322 may receive and process requests. For example, the processing module 322 may process a request to render primary content 32 to the output device 18 at an accelerated speed of the primary content. The processing module 322 may receive the request from the remote control 20 or the control buttons 19. Responsive to receiving the request, the processing module 322 may associate the primary content 32 to secondary content 35 based on secondary information 34 in the form of a secondary information identifier that is included in the transmission 297 received by the multiplexer 214.

[00167] Figure 16A is a block diagram illustrating a component transmission 291, according to an example embodiment. The component transmission 291 may be communicated by the live feed 302 and received by the insertion server 308. The component transmission 291 may include multiple channels 323 that may carry entertainment assets 44, advertisement assets 46 and associated secondary information 34 as described further below.

[00168] Figure 16B is a block diagram illustrating a component transmission 293, according to an example embodiment. The component transmission 293 may be communicated by the entertainment server 298 and received by the insertion server 308. The component transmission 293 may include multiple channels 323 that may carry entertainment assets 44 and associated secondary information 34 as described further below.

[00169] Figure 16C is a block diagram illustrating a component transmission 295, according to an example embodiment. The component transmission 295 may be communicated by the advertisement server 304 and received by the insertion server 308. The component transmission 295 may include multiple channels 323 that may carry advertisement assets 46 and associated secondary information 34 as described further below.

[00170] Figure 16D is a block diagram illustrating a transmission 297, according to an example embodiment. The transmission 297 may be communicated by the insertion server 308 and received by the receiving device 12. The transmission 297 may be generated based the component transmission 291 received from the live feed 302 and the component transmission 293 received from the entertainment server 296 and the component transmission 295

received from the advertisement server 304. The transmission 297 may include multiple channels 323 that may be selected by the user via the remote control 20 or the control buttons 19. The transmission 297 may carry entertainment assets 44 and corresponding secondary information 34, advertisement assets 46 and corresponding secondary information.

[00171] Figure 17 is a block diagram illustrating multiple streams associated with a single channel 323, according to an example embodiment. The streams may include a video stream 327, an audio stream 329, and a metadata stream 331. Each stream 327 may be embodied as packets 82 that may be received at the demultiplexer 217 as they enter the receiving device 12. The demultiplexer 217 may concatenate the payload of the packets to generate frames 80. The frames 80 are shown to include reference frames 86 and reference frame changes 84 as previously described. The reference frames 86, the reference frame changes 84, and the metadata frames 87 may be descrambled and communicated to the decoder 230. The decoder 230 may decode the frames 80 into image data and sound data and communicate the image data and sound data to the render module 234 that renders the image and sound data to the output device 18 including the display device 26 and the sound device 24.

[00172] Figure 18 is a block diagram illustrating the packet 82, according to an example embodiment. The packet 82 is shown to include a header 340 and a payload 342. The header 340 may include a stream identifier 344 that may be used to identify packets 82 of a single stream. For example, a first stream identifier may identify a first stream carrying packets 82 with a video payload, a second stream identifier may identify a second stream that may include packets 82 carrying an audio payload, and a third stream identifier may identify a third stream 327 that includes packets 82 carrying a metadata payload. The payload 342 may include frame information to construct the frames 80.

[00173] Figure 19 is a block diagram illustrating secondary information 34 in the form of a secondary information table 350, according to an example embodiment. The secondary information table 350 may be carried in the metadata stream 331 of a channel 323 and may be read by the processing module 322 responsive to the receiving device 12 receiving a trick mode request. The secondary information table 350 may be utilized by the processing module 322 to identify the location of additional secondary information 34. The secondary

information table 350 may include entries that correspond to the type of trick mode request. For example, trick mode requests may include fast forward and rewind versions at accelerated speeds as previously described. Each trick mode request is associated with a secondary information identifier 352 and a secondary information offset 354. The secondary information identifier 352 may identify the location of the secondary information 34. For example, the secondary information identifier may identify the audio stream 329 and video stream 327 of a channel that may be currently rendered to the output device 18, the metadata stream 331 of a channel that may be currently rendered to the output device 18, a channel 323 that is different from the channel 323 that is currently being rendered to the output device 18, a file on the local storage device 309 or a file on the remote storage device 316. The secondary information offset 354 may be utilized to identify an offset from the beginning of the identified secondary information 34. For example, the secondary information offset 354 may be expressed in bytes or time from the start of the identified secondary information 34.

[00174] Figure 20 is a block diagram illustrating primary content 32 and secondary information 34 communicated in the video stream 327 and the audio stream 329 of a single channel 323, according to an example embodiment. The channel 323 is shown to include the video stream 327 communicating primary content 32 and secondary information 34, the audio stream 329 communicating primary content 32 and secondary information 34, and the metadata stream 331 communicating metadata and a secondary information table 350. Responsive to the primary content 32 being rendered to the output device 18 and receipt of a trick mode request, the secondary information table 350 may be accessed by the processing module 322 to identify the location of the secondary information 34 in the video stream 327 and audio stream of the same channel 323.

[00175] Figure 21 is a block diagram illustrating primary content 32 communicated in a first channel 323 and secondary information 34 communicated in a second channel 323, according to an example embodiment. The first channel 323 is shown to include the video stream 327 communicating primary content 32, the audio stream 329 stream 327 communicating primary content 32, and the metadata stream 331 communicating metadata and a secondary information table 350. Responsive to the primary content 32 being

rendered to the output device 18 and receipt of a trick mode request, the secondary information table 350 may be accessed by the processing module 322 to identify the location of the secondary information 34 in the video stream 327 and audio stream of the second channel 323.

[00176] Figure 22 is a block diagram illustrating the primary content 32 communicated in the video stream 327 and the audio stream 329 of a channel 323 and the secondary information 34 communicated in a metadata stream 331 of the same channel 323, according to an example embodiment. The channel 323 is shown to include the video stream 327 communicating the primary content 32, the audio stream 329 communicating the primary content 32, and the metadata stream 331 communicating metadata, a secondary information table 350, and secondary information 34. Responsive to the primary content 32 being rendered to the output device 18 and receipt of a trick mode request, the secondary information table 350 may be accessed by the processing module 322 to identify the location of the secondary information 34 in the metadata stream 331 of the same channel 323.

[00177] Figure 23 is a block diagram illustrating a transmission 297 including primary content 32 that includes end of primary content markers 361, according to an example embodiment. The transmission 297 is shown to include primary content 32 in the form of an entertainment asset 44 and an advertisement asset 46 and respectively corresponding secondary content 35 in the form of an entertainment recording 52 and an advertisement recording 54. The end of primary content markers 361 may be used by the processing module 322 to identify a location in the primary content 32 to resume play. For example, responsive to receipt of a play request while rendering the entertainment recording 52 to the output device 18, the processing module 322 may skip to the end of primary content marker 361 associated with the entertainment asset 44. Also for example, responsive to receipt of a play request while rendering the advertisement recording 54 to the output device 18, the processing module 322 may skip to the end of primary content marker 361 associated with the advertisement asset 46. Other example embodiments may utilize other forms of secondary content 35 (e.g., advertisement slide show 70 and entertainment slide show 62).

[00178] Figure 24 is flowchart illustrating the method 370, according to an example embodiment, to modify playback of primary content 32 a receiving device 12. The operation 370 commences at operation 374 with the demultiplexer 217 receiving the transmission 297 via the interface 223. The transmission 297 may include primary content 32 and a secondary information table 360 that may include secondary information identifiers 352. The demultiplexer 217 may demultiplex the transmission 297 according to channels 323 and store the demultiplexed transmission 297 as packets 82 in the local storage device 309. For example, the demultiplexer 217 may utilize the audio module 219, the video module 221 and the descrambler 225 to store the demultiplexed transmission 297. Other example embodiments may include a demultiplexer 217 that further depacketizes the transmission 297 and concatenates the payloads 342 to generate frames 86 that may be stored in the local storage device 309.

[00179] At operation 376, the descrambler 225 may identify the streams 327, 329, 331 (video, audio, metadata) in the transmission 297 associated with the most recent channel request received at the receiving device 12 and descramble the identified streams 327, 329, 331 based on descrambling information in the metadata stream 331. For example, the user may have requested the channel 323 that carries ESPN (e.g., the ESPN channel). Further, the processor 224, in the decoder system 208, may communicate the descrambled streams 327, 329, 331 to the decoder 230.

[00180] At operation 380, the decoder 230 decodes the primary content 32 in the identified streams 327 and communicates the primary content 32 to the render module 234.

[00181] At operation 382, the render module 234 renders the primary content 32 to the output device 18 that may include the display device 26 and the sound device 24. For example, the render module 234 may render an entertainment asset 44 (e.g., 2006 World Cup Soccer Game) to the output device 18.

[00182] At operation 384, the processing module 322 receives a pause request via the control buttons 19 to pause the rendering of the 2006 World Cup Soccer Game to the output device 18. The processing module 322, in turn, may communicate the request to the descrambler 228 and the decoder system 208. The descrambler 228 stops descrambling packets 82 and the decoder system 208

stops retrieving the descrambled streams from the storage device 309. Accordingly, the demultiplexer 217 continues to store the transmission 297 to the memory 226 with possible overflow to the database 22.

[00183] At operation 386, the processing module 322 receives a play request via the control buttons 19. The processing module 322, in turn, may communicate the play request to the decoder system 208 and the descrambler 225. The descrambler 225 may respond by descrambling. The processor 224, in the decoder system 208, in turn, may respond by retrieving or reading the descrambled streams (e.g., transmission 297) from the local storage device 309 that may subsequently be utilized to render primary content 32 to the output device 18 at a normal speed for the primary content 32.

[00184] At operation 388, the processing module 322 receives a trick mode request via the remote control 20 to render the primary content 32 at the output device 18 at an accelerated speed. For example, the processing module 322 may receive a request to fast forward the primary content 32 at six-times the normal speed (e.g., 6X FF VERSION).

[00185] At operation 390, the processing module 322 may modify the playback of primary content 32 by associating the primary content 32 to the secondary content 35 responsive to receiving the trick mode request. For example, the processing module 322 may retrieve the secondary information table 350 from the metadata stream 331 associated with the channel 323 that carries ESPN (e.g., primary content 32). Further the processing module 322 may identify the secondary information identifier 352 and the secondary information offset 354 in the secondary information table 350 based on the trick mode request (e.g., 6X FF VERSION). In the present example embodiment, the secondary information table 350 may identify the secondary information 34 as located in a video stream 327 and an audio stream 329 of a channel 323 different from the channel 323 that carries ESPN. Accordingly, the processing module 322 may, in an example embodiment, communicate the identified channel 323 to the descrambler 328 that, in turn, processes the corresponding metadata stream 331, video stream 327 and audio stream 329. For example, the descrambler 328 may utilize the descrambling information in the metadata stream 331 to descramble the video stream 327 and audio stream 329. In the present example, the descrambler 328

descrambles secondary information 34 in the form of an entertainment application 68.

[00186] At operation 391, the processing module 322 completes the association of primary content 32 to secondary content 35 by causing the entertainment application 68 to execute. The entertainment application 68 executes to generate secondary content 35 in the form of an entertainment recording 52.

[00187] At operation 392, the decoder 230 decodes the entertainment recording 52 and communicates the decoded entertainment recording 52 to the render module 234.

[00188] At operation 393, the render module 234 may render the entertainment recording 52 to the output device 18 including the display device 26 and the sound device 24 at a normal speed of the entertainment recording 52. For example, the entertainment recording 52 may introduce the players of the teams participating in the 2006 World Cup Soccer Game.

[00189] At operation 394, the processing module 322 may receive a play request via the control buttons 19. The processing module 322, in turn, may communicate the ESPN channel 323 to the descrambler 228 that, in turn, descrambles the associated streams 327, 329, 331 based on the identified ESPN channel 323. Next, the processing module 322 identifies the end of primary content marker 361 in the primary content 32 (e.g., 2006 World Cup Soccer Game) and communicates the identified location to the decoder system 206. The processor 224, in the decoder system 208, in turn, communicates the video, audio, and metadata streams 327, 329, 331 that have been identified based on the location to the decoder 230.

[00190] At operation 395, the decoder 230 decodes the primary content 32 (e.g., 2006 World Cup Soccer Game).

[00191] At operation 396, the render module 234 renders the primary content 21 in the form of the entertainment asset 44 (e.g., 2006 World Cup Soccer Game) to the output device 18.

Other Example Embodiments – Location of Secondary Information

[00192] The processing module 322 in the above described example embodiment utilized a secondary information identifier 352 to identify a channel 323 in the transmission 297 that carried secondary information 34 in the form of

the entertainment application 68. Other example embodiments, however, may identify other locations from which to retrieve the secondary information 34 (e.g., entertainment application 68). For example, the secondary information identifier 352 may further identify the secondary information 34 as located in the audio streams 329 and video stream 327 of the channel 323 that is currently being rendered to the output device 18 (e.g., ESPN channel), the metadata stream 331 of the channel 323 that is currently being rendered to the output device 18, the local storage device 309 or the remote storage device 316.

Other Example Embodiment - Same Channel – Audio and Video Streams

[00193] In this example embodiment the processing module 322 may utilize the secondary information identifier 352 (e.g., stream, stream, channel) to retrieve the secondary information 34 (e.g., entertainment application 68) from the audio stream 329 and the video streams 327 of the ESPN channel 323 responsive to receipt of a trick mode request. Further, the decoder 230 may retrieve the primary content 32 from the audio stream 329 and the video streams 327 in the absence of processing a trick mode request.

Other Example Embodiment - Same Channel – Metadata Stream

[00194] In this example embodiment the processing module 322 may utilize the secondary information identifier 352 (e.g., stream, channel) to retrieve the secondary information 34 (e.g., entertainment application 68) from the metadata stream 331 of the ESPN channel 323 responsive to receipt of a trick mode request. Further, the processing module 322 may retrieve the primary content 32 from metadata stream 331 in the absence of processing a trick mode request.

Other Example Embodiment - Local Storage Device

[00195] In this example embodiment the processing module 322 may utilize the secondary information identifier (e.g., URL) to retrieve the secondary information 34 (e.g., entertainment application 68) from the local storage device 309. Accordingly this example embodiment requires the demultiplexer 217 to retrieve the secondary information 34 (e.g., entertainment application 68) from the transmission 297 and to store the retrieved secondary information 34 in the form of an addressable file on the local storage device 309. It will be appreciated

that the secondary information 34 (e.g., entertainment application 68) may be stored on the local storage device 309 asynchronous to receipt of the corresponding primary content 32. For example, as described above, the secondary information 34 (e.g., entertainment application 68) utilized by the processing module 322 to generate the entertainment recording 52 may have been received and stored on the local storage device 309 device three days before the receiving device 12 received the entertainment asset 44 (e.g., 2006 World Cup Soccer Game). Indeed, the secondary information 34 (e.g., entertainment application 68) may be stored on the local storage device 309 any time (e.g., seconds, hours, months, days, etc.) prior to receipt of the corresponding primary content 32.

Other Example Embodiment - Remote Storage Device

[00196] In this example embodiment the processing module 322 may utilize the secondary information identifier (e.g., URL) to retrieve a file from a remote storage device 316 that contains the secondary information 34 (e.g., entertainment application 68). Secondary information 34 may be stored on the remote storage device 316 asynchronous to receipt of the associated primary content 32 at the receiving device 12.

Other Example Embodiments - Secondary Information

[00197] The processing module 322 in the above described example embodiment associated primary content 32 in the form of an entertainment asset 44 (e.g., 2006 World Cup Soccer Game) to corresponding secondary content 35 in the form of an entertainment recording 52 (e.g., Introduction of the players of the teams participating in the 2006 World Cup Soccer Game). The processing module 322 generated the secondary content 35 by executing the entertainment application 68. Other example embodiments may utilize other types of secondary information 34. For example, other secondary information 34 may include secondary content 35, secondary metadata 58 or a secondary application 60 to generate an entertainment slide show 62.

Other Example Embodiments - Secondary Content

[00198] The secondary content 35 may include an entertainment recording 52 or an entertainment slide show 62. The processing module 322 may immediately utilize the secondary content 35.

Other Example Embodiments - Secondary Metadata

[00199] The secondary metadata 58 may include entertainment recording metadata 64 or entertainment slide show metadata 66 that may be utilized by the processing module 322 to generate secondary content 35. For example, the processing module 322 may use the secondary metadata 58 in the form of entertainment recording metadata 64 to identify reference frames 86 reference frame changes 84 in the primary content 32 to generate an entertainment recording 52. In another example the processing module 322 may use the secondary metadata 58 to identify reference frames 86 and add fade-ins and fade-outs to generate an entertainment slide show 62.

Other Example Embodiments - Secondary Application

[00200] Finally, the secondary application 60 may further be executed by the processing module 322 to generate an entertainment slide show 62.

Other Examples – Advertisement Assets

[00201] Further, it will be appreciated by one skilled in the art that primary content 32 may also include an advertisement asset 46. Accordingly, the advertisement asset 46 may be associated to corresponding advertisement secondary information 39 (e.g., advertisement recording 54, advertisement slide show 70, advertisement recording metadata 72, advertisement slide show metadata, advertisement application 76).

Other Examples – Medium and Presentation of Primary and Secondary Content

[00202] Other example may include primary content 32 and secondary content 35 that may be embodied in one or more mediums (e.g., visual, audio, kinetic, etc.), the visual medium presented as motion or still. It will be appreciated by one skilled in the art that the medium and presentation of primary content 32 does not necessarily determine the medium and presentation of secondary

content 35 and that any combination of the medium and presentation of the primary content 3 may be associated to secondary content in any combination of medium and presentation. For example, primary content 32 embodied solely in audio may be associated with secondary content 35 embodied as audio and visual (e.g., motion or still). In another embodiment, secondary content 35 may include non-derivative secondary content 35 and derivative secondary content 35. For example, secondary content 35 may include video that may be derived from the corresponding primary content 32 and audio that may not be derived from the corresponding primary content 32.

Other Example – Non-derivative Secondary Content

[00203] In response to the trick mode request, in the above described example embodiment, the processing module 322 generated derivative secondary content (e.g., entertainment recording 52) for rendering to an output device 18 at a normal speed for the derivative secondary content. In another example, the processing module 322 may generate non-derivative secondary content (e.g., advertisement recording 54) for rendering to the output device 18.

Other Examples – Offsets into Primary and Secondary Content

[00204] As previously described, in like manner, the author of secondary content 35 may exercise complete editorial control over selection of the offset into the secondary content 35 from which rendering is to begin based on the offset into the primary content 32 that may be detected responsive to the trick mode request. It will further be appreciated that the author of secondary metadata 58 and a secondary application 60 may exercise the same editorial control.

Other Examples – Fast Forwarding Past the End of Secondary Content

[00205] A user that continues to fast forward after the secondary content 35 (e.g., advertisement) has ended may, in one embodiment, view corresponding primary content 32 that may be rendered at an accelerated speed.

[00206] **Figure 25** is a flow chart illustrating a method 400, according to an example embodiment, to communicate a transmission 297 that facilitates modification of playback of primary content 32 at a receiving device 12. Illustrated on the far right are operations performed by the advertisement server

304. Illustrated on the center right are operations performed by the entertainment server 296. Illustrated on the center left are operations performed by the insertion server 308. Illustrated on the far left are operations performed by the receiving device 12. Illustrated in the center are operations performed by the live feed 302.

[00207] The method 400 commences at operation 401 with the live feed 302 communicating a component transmission 291 to the insertion server 308. The component transmission 291 may include primary content 32 including entertainment assets 44 (e.g., movie, serial episode, documentary, etc.) and advertisement assets 46 (e.g., advertisement, public service announcement, infomercial, etc.). Further, the component transmission 291 may include secondary information 34 including a secondary information table 350. The secondary information table 350 may include a secondary information identifier 352 that may be utilized to associate the primary content 32 to secondary content 35 or secondary information 34 that may be utilized to generate the secondary content 35.

[00208] At operation 402, the transport module 310 at the insertion server 308 may receive the component transmission 291 from the live feed 302.

[00209] At operation 403 the entertainment server 296 communicates a component transmission 293 to the insertion server 308. The component transmission 293 may include primary content 32 including entertainment assets 44 (e.g., movie, serial episode, documentary, etc.) and secondary information 34 including a secondary information table 350. The secondary information table 350 may include a secondary information identifier 352 that may be utilized to associate the primary content 32 to secondary content 35 or secondary information 34 that may be utilized to generate the secondary content 35.

[00210] At operation 404, the transport module 310 at the insertion server 308 may receive the component transmission 293 from the entertainment server 296.

[00211] At operation 406, the advertisement server 304 communicates a component transmission 295 to the insertion server 308. The component transmission 295 may include primary content 32 including advertisement assets 46 (e.g., advertisement, public service announcement, infomercial, etc.) and secondary information 34 including a secondary information table 350. The secondary information table 350 may include a secondary information identifier

352 that may be utilized to associate the primary content 32 with secondary content 35 or secondary information 34 that may be utilized to generate the secondary content 35.

[00212] At operation 408, at the insertion server 308, the transport module 310 may receive the component transmission 295 from the advertisement server 304.

[00213] At operation 410, the transport module 310 may generate a transmission 297 based on the component transmissions 293, 295 received from the entertainment server 290 and the advertisement server 304. For example, the transmission 297 may include the primary content 32 and secondary information 34 from the component transmission 293 (e.g., entertainment assets 44 and associated secondary information 34) and the primary content 32 and secondary information 34 from the component transmission 295 (e.g., advertisement assets 46 and associated secondary information 34).

[00214] At operation 412, the transmission module 312 communicates the transmission 297 to the receiving device 12.

[00215] At operation 414, the receiving device 12 receives the transmission 297. As described above, the processing module 322 at the receiving device 12 may utilize the secondary information identifier 352 in the transmission 297 to associate the primary content 32 to secondary content 35. For example, the primary content 32 may include an entertainment asset 44 that may be associated to secondary content 35 in the form of an entertainment recording 52. Another example may include primary content 32 that may include an advertisement asset 46 that may be associated to secondary content 35 in the form of an advertisement recording 54.

[00216] In general, the transmission 297 received from the insertion server 308 may support the association of primary content to secondary content as previously described by the method 370.

[00217] **Figure 26** is a display device 26 with an image 134, according to an example embodiment, that was rendered from an advertisement recording 54. The image 134 is shown to include a progress bar 136 that provides a visual indication to the user of the amount of time remaining to fast forward the entire advertisement asset 46. Specifically, the progress bar 136 provides the visual indication of the advertisement asset 46 fast forwarding at two-times the normal speed.

[00218] Figure 27 shows a diagrammatic representation of a machine in the example form of a computer system 600 within which a set of instructions, for causing the machine to perform any one or more of the methodologies discussed herein, may be executed. In alternative example embodiments, the machine operates as a standalone device or may be connected (e.g., networked) to other machines. In a networked deployment, the machine may operate in the capacity of a server or a client machine in server-client network environment, or as a peer machine in a peer-to-peer (or distributed) network environment. The machine may be a server computer, a client computer, a personal computer (PC), a tablet PC, a set-top box (STB), a Personal PrimaryAssistant (PDA), a cellular telephone, a web appliance, a network router, switch or bridge, an iPod, a personal video recorder (PVR) (e.g., analog or digital input), a personal digital recorder (PDR) (e.g., analog or digital input), a mobile phone, a portable media player, a game console or any machine capable of executing a set of instructions (sequential or otherwise) that specify actions to be taken by that machine. Further, while only a single machine is illustrated, the term “machine” shall also be taken to include any collection of machines that individually or jointly execute a set (or multiple sets) of instructions to perform any one or more of the methodologies discussed herein.

[00219] The example computer system 600 includes a processor 602 (e.g., a central processing unit (CPU) a graphics processing unit (GPU) or both), a main memory 604 and a static memory 606, which communicate with each other via a bus 608. The computer system 600 may further include a video display unit 610 (e.g., a liquid crystal display (LCD) or a cathode ray tube (CRT)). The computer system 600 also includes an alphanumeric input device 612 (e.g., a keyboard), a cursor control device 614 (e.g., a mouse), a disk drive unit 616, a signal generation device 618 (e.g., a speaker) and a network interface device 620.

[00220] The disk drive unit 616 includes a machine-readable medium 622 on which is stored one or more sets of instructions (e.g., software 624) embodying any one or more of the methodologies or functions described herein. The software 624 may also reside, completely or at least partially, within the main memory 604 and/or within the processor 602 during execution thereof by the computer system 600, the main memory 604 and the processor 602 also constituting machine-readable media.

[00221] The software 624 may further be transmitted or received over a network 626 via the network interface device 620.

[00222] While the machine-readable medium 622 is shown in an example embodiment to be a single medium, the term "machine-readable medium" should be taken to include a single medium or multiple media (e.g., a centralized or distributed database, and/or associated caches and servers) that store the one or more sets of instructions. The term "machine-readable medium" shall also be taken to include any medium that is capable of storing, encoding or carrying a set of instructions for execution by the machine and that cause the machine to perform any one or more of the methodologies of the present disclosure. The term "machine-readable medium" shall accordingly be taken to include, but not be limited to, solid-state memories, optical and magnetic media, and carrier wave signal.

[00223] Thus, systems and methods to modify playback or playback have been described. Although the present disclosure has been described with reference to specific example embodiments, it will be evident that various modifications and changes may be made to these example embodiments without departing from the broader spirit and scope of the disclosure. Accordingly, the specification and drawings are to be regarded in an illustrative rather than a restrictive sense.

CLAIMS

1. A system including:
a request module to receive a request for primary content; and
a communication module to
communicate primary content to a receiving device, the receiving device to render the primary content to an output device at a normal speed of the primary content,
associate the primary content to secondary information,
communicate the secondary information to the receiving device, the receiving device to utilize the secondary information to render secondary non-derivative content to the output device instead of the primary content, the secondary non-derivative content not being derived from the primary content, the receiving device to render the secondary non-derivative content responsive to receipt of a request at the receiving device to render the primary content at the receiving device at an accelerated speed of the primary content.

2. The system of claim 1, wherein the communication module communicates the primary content to the receiving device to store the primary content to a local storage device, the receiving device to retrieve the primary content from the local storage device before the receiving device is to render the primary content to an output device at a normal speed of the primary content.

3. The system of claim 1, wherein the communication module is to associate the primary content to a secondary application that is utilized by the communication module to generate secondary content.

4. A system including:
a request module to receive a request for primary content; and
a communication module to
 communicate primary content to a receiving device, the receiving device to render the primary content to an output device at a normal speed of the primary content,
 associate the primary content to secondary information, and to
 communicate the secondary information to the receiving device,
the receiving device to utilize the secondary information to render secondary derivative content to the output device at a normal speed for the secondary derivative content, the secondary derivative content being derived from the primary content, the receiving device to render the secondary derivative content instead of primary content responsive to receipt of a request at the receiving device to render the primary content at the receiving device at an accelerated speed of the primary content.
5. The system of claim 4, wherein the output device includes at least one of a display device and a sound device.
6. The system of claim 4, wherein the primary content includes a video on demand asset, wherein the video on demand asset includes any one from a group of video on demand assets including an entertainment asset and an advertisement asset.
7. A system including:
a request module to receive a request for primary content; and
a communication module to
 communicate primary content to a receiving device, the receiving device to render the primary content to an output device at a normal speed of the primary content,
 receive a request from the receiving device to communicate the primary content for rendering at the output device at the receiving device at an accelerated speed of the primary content,

associate the primary content to secondary non-derivative content,

communicate the secondary non-derivative content to the receiving device instead of the primary content, the secondary non-derivative content not being derived from the primary content, the communication module to communicate responsive to receipt of the request, the receiving device to render the secondary non-derivative content to the output device.

8. The system of claim 7, wherein the secondary non-derivative content includes any one from a group including an entertainment recording, an entertainment slide show, an advertising recording and an advertisement slide show.

9. The system of claim 7, wherein the communication module generates the secondary content based on the primary content and secondary metadata, wherein the secondary metadata includes anyone from a group including entertainment recording metadata, entertainment slide show metadata, advertisement recording metadata and advertisement slide show metadata.

10. A system including:
a request module to receive a request for primary content; and
a communication module to
communicate primary content to a receiving device, the receiving device to render the primary content to an output device at a normal speed of the primary content,
receive a request from the receiving device to communicate the primary content for rendering at the output device at the receiving device at an accelerated speed of the primary content,
associate the primary content to secondary derivative content,
communicate the secondary derivative content to the receiving device instead of the primary content responsive to receipt of the request, the secondary derivative content being derived from the primary content,

the receiving device to render the secondary derivative content to the output device at a normal speed for the secondary derivative content.

11. The system of claim 10, wherein the communication module is to generate the secondary derivative content with a secondary application, wherein the secondary application includes anyone from a group including an entertainment application and an advertisement application.
12. The system of claim 10, wherein the communication module associates the primary content to the secondary derivative content based on the direction of the trick mode selection and the speed of the trick mode selection, wherein the direction of the trick mode selection includes any one from a group including a fast forward request and a rewind request and the speed of the trick mode selection includes any one from a group including two-times normal speed, four-times normal speed, and six-times normal speed.
13. The system of claim 10, wherein the request module is to receive the request from the receiving device includes utilizing any one from a group of protocols comprising the real time streaming protocol (RTSP) and the digital storage media command and control protocol (DSM-CC).
14. A system including:
 - a client communication module to receive primary content at a receiving device, the primary content for render to an output device at the receiving device at a normal speed for the primary content;
 - a receiving module to receive a request to render the primary content to the output device at an accelerated speed for the primary content,
 - the client communication module to
 - receive a simulated primary content at the receiving device, the simulated primary content for render to the output device at the receiving device so as to simulate render of the primary content to the output device at the receiving device at an accelerated speed,
 - generate secondary derivative content based on the simulated primary content; and

a render module to render the secondary derivative content to the output device instead of the simulated primary content, the render module to render the secondary derivative content at a normal speed for the secondary derivative content and responsive to receipt of the request.

15. The system of claim 14, wherein the primary content includes any one from a group including an entertainment asset and an advertisement asset and wherein the simulated primary content includes anyone from a group including an accelerated speed entertainment asset and an accelerated speed advertisement asset.

16. The system of claim 14, wherein the secondary derivative content includes any one from a group including a programmatically generated entertainment slide show and a programmatically generated advertisement slide show.

17. The system of claim 14, wherein the output device includes a display device and a sound device.

18. The system of claim 14, wherein the receiving module receives a trick mode request.

19. The system of claim 18, wherein the trick mode request includes any one from a group including a trick request to fast forward the primary content and a trick mode request to rewind the primary content.

20. The system of claim 19, wherein the receiving module communicates the trick mode request.

21. The system of claim 20, wherein the receiving module utilizes any one from a group of protocols comprising the real time streaming protocol (RTSP) and the digital storage media command and control protocol (DSM-CC).

22. A system including:
a demultiplexer to
receive a transmission at a receiving device, the transmission including primary content and a secondary information identifier,
store the transmission on a local storage device;
a processor to retrieve the transmission from the local storage device;
a render module to render the primary content to an output device at the receiving device at a normal speed for the primary content; and
a processing module to
receive a request to render the primary content to an output device at the receiving device at an accelerated speed of the primary content,
associate the primary content to secondary non-derivative content based on the secondary information identifier, the render module to render the secondary non-derivative content, instead of the primary content, to the output device at the receiving device, the secondary non-derivative content not being derived from the primary content, the render module to render responsive to receipt of the request.
23. The system of claim 22, wherein the request includes a trick mode request and wherein the trick mode request includes any one from a group of trick mode requests including a fast forward request and a rewind request.
24. The system of claim 22, wherein the output device includes a display device and a sound device.
25. The system of claim 22, wherein the secondary non-derivative content includes any one from a group including an entertainment recording, an advertisement recording, an entertainment slide show, and an advertisement slide show, entertainment recording metadata, advertisement recording metadata, entertainment slide show metadata and advertisement slide show metadata.

26. The system of claim 23, wherein the processing module generates the secondary non-derivative content with a secondary application, wherein the secondary application includes any one from a group including an entertainment application and an advertisement application.

27. A system including:

a demultiplexer to

receive a transmission at a receiving device, the transmission including primary content and a secondary information identifier,

storing the transmission on a local storage device;

a processor to retrieve the transmission from the local storage device;

a render module to render the primary content to an output device at the receiving device at a normal speed for the primary content; and

a processing module to

receive a request to render the primary content to an output device at the receiving device at an accelerated speed of the primary content;

associate the primary content to secondary derivative content based on the secondary information identifier, the render module to render the secondary derivative content, instead of the primary content, to the output device at the receiving device at a normal speed for the secondary derivative content, the render module to render responsive to receiving the request, the secondary derivative content being derived from the primary content,.

28. The system of claim 27, wherein processing module generates the secondary derivative content based on secondary metadata and the primary content.

29. The system of claim 27, wherein the processing module identifies reference frames in the primary content based on the secondary metadata.

30. The system of claim 27, processing module adds fade-ins and fade-outs to the reference frames.

31. The system of claim 27, wherein the processing module retrieves secondary information based on the secondary information identifier, wherein the secondary information identifier includes a universal resource locator that identifies the secondary information on a storage device, wherein the storage device is accessed via a remote server based on the universal resource locator.

32. The system of claim 27 wherein the transmission includes a stream from any one of a group of streams including a motion picture experts group – two (MPEG-2) compressed stream, a motion picture experts group – four (MPEG-4) compressed stream and a VC1 compressed stream, wherein the stream is embedded in a transport that includes any one of a group of transports including an MPEG transport and an Internet Protocol (IP) transport.

33. A system including:

a transport module to generate a transmission that includes primary content and a secondary information identifier; and

a transmission module to communicate the transmission to a receiving device that stores the transmission in a local storage device, the receiving device to retrieve the transmission from the local storage device, the receiving device to utilize the secondary information identifier to associate the primary content to a secondary non-derivative content, the secondary non-derivative content not being derived from the primary content, the receiving device to render the secondary non-derivative content, instead of the primary content, to an output device at the receiving device responsive to receipt of a request to render the primary content to the output device at an accelerated speed of the normal content.

34. The system of claim 33, wherein the secondary non-derivative content includes content any one from a group including an entertainment recording, an advertisement recording, an entertainment slide show, and an advertisement slide show, entertainment recording metadata, advertisement recording metadata, entertainment slide show metadata, advertisement slide show metadata, an entertainment application, and an advertisement application.

35. The system of claim 33, wherein the primary content includes any one from a group including an entertainment asset and advertisement asset.

36. The system of claim 33, wherein the transmission includes a stream from any one from a group of streams including an MPEG-2 compression stream, an MPEG-4 compression stream, and a VC1 compression stream, wherein the stream is embedded in a transport that includes any one of a group of transports including an MPEG transport and an IP transport.

37. A system including:

a transport module to generate a transmission that includes primary content and a secondary information identifier; and

a communication module to communicate the transmission to a receiving device that stores the transmission in a local storage device, the receiving device to retrieve the transmission from the local storage device, the receiving device to utilize the secondary information identifier to associate the primary content to a secondary derivative content, the secondary derivative content being derived from the primary content, the receiving device to render the secondary derivative content, instead of the primary content, to an output device at the receiving device at a normal speed of the secondary derivative content responsive to receipt of a request to render the primary content to the output device at the receiving device at an accelerated speed of the normal content.

38. The system of claim 37, wherein the secondary information identifier includes a universal resource locator.

39. The system of claim 38, wherein the universal resource locator identifies anyone from a group including a file on a remote storage device and a file on a local storage device.

40. A method including:
receiving a request for primary content;
communicating primary content to a receiving device, the receiving device to render the primary content to an output device at a normal speed of the primary content;
associating the primary content to secondary information; and
communicating the secondary information to the receiving device, the receiving device to utilize the secondary information to render secondary non-derivative content to the output device instead of the primary content, the secondary non-derivative content not being derived from the primary content, the receiving device to render the secondary non-derivative content responsive to receipt of a request at the receiving device to render the primary content at the receiving device at an accelerated speed of the primary content.

41. The method of claim 40, wherein the communicating primary content to the receiving device includes the receiving device to store the primary content to a local storage device and to retrieve the primary content from the local storage device before the receiving device is to render the primary content to an output device at a normal speed of the primary content.

42. The method of claim 40, wherein the request includes a trick mode request and wherein the trick mode request includes any one from a group of trick mode requests including a fast forward request and a rewind request.

43. A method including:
receiving a request for primary content;
communicating primary content to a receiving device, the receiving device to render the primary content to an output device at a normal speed of the primary content;
associating the primary content to secondary information; and
communicating the secondary information to the receiving device, the receiving device to utilize the secondary information to render secondary derivative content to the output device at a normal speed for the secondary derivative content, the secondary derivative content being derived from the

primary content, the receiving device to render the secondary derivative content instead of primary content responsive to receipt of a request at the receiving device to render the primary content at the receiving device at an accelerated speed of the primary content.

44. The method of claim 43, wherein the output device includes a display device and a sound device.

45. The method of claim 43, wherein the primary content includes a video on demand asset, wherein the video on demand asset includes any one from a group of video on demand assets including an entertainment asset and an advertisement asset.

46. A method including:
receiving a request for primary content;
communicating primary content to a receiving device, the receiving device to render the primary content to an output device at a normal speed of the primary content;
receiving a request from the receiving device to communicate the primary content for rendering at the output device at the receiving device at an accelerated speed of the primary content;
associating the primary content to secondary non-derivative content;
communicating the secondary non-derivative content to the receiving device instead of the primary content, the secondary non-derivative content not being derived from the primary content, the communicating responsive to receiving the request, the receiving device to render the secondary non-derivative content to the output device.

47. The method of claim 46, wherein the secondary non-derivative content includes any one from a group including an entertainment recording, an entertainment slide show, an advertising recording and an advertisement slide show.

48. The method of claim 46, wherein associating the primary content to secondary content includes generating secondary content based on the primary content and secondary metadata, wherein the secondary metadata includes anyone from a group including entertainment recording metadata, entertainment slide show metadata, advertisement recording metadata and advertisement slide show metadata.

49. A method including:
receiving a request for primary content;
communicating primary content to a receiving device, the receiving device to render the primary content to an output device at a normal speed of the primary content;
receiving a request from the receiving device to communicate the primary content for rendering at the output device at the receiving device at an accelerated speed of the primary content;
associating the primary content to secondary derivative content;
communicating the secondary derivative content to the receiving device instead of the primary content responsive to receiving the request, the secondary derivative content being derived from the primary content, the receiving device to render the secondary derivative content to the output device at a normal speed for the secondary derivative content.

50. The method of claim 49, wherein the associating the primary content to the secondary derivative content includes generating the secondary content with a secondary application, wherein the secondary application includes anyone from a group including an entertainment application and an advertisement application.

51. The method of claim 49, wherein the associating the primary content to the secondary derivative content is based on the direction of the trick mode selection and the speed of the trick mode selection, wherein the direction of the trick mode selection includes any one from a group including a fast forward request and a rewind request and the speed of the trick mode selection includes

any one from a group including two-times normal speed, four-times normal speed, and six-times normal speed.

52. The method of claim 49, wherein receiving the request from the receiving device includes utilizing any one from a group of protocols comprising the real time streaming protocol (RTSP) and the digital storage media command and control protocol (DSM-CC).

53. A method including:

receiving primary content at a receiving device, the primary content for render to an output device at the receiving device at a normal speed for the primary content;

receiving a request to render the primary content to the output device at an accelerated speed for the primary content;

receiving a simulated primary content at the receiving device, the simulated primary content for render to the output device at the receiving device so as to simulate render of the primary content to the output device at the receiving device at an accelerated speed;

generating secondary derivative content based on the simulated primary content; and

rendering the secondary derivative content to the output device instead of the simulated primary content, the rendering the secondary derivative content at a normal speed for the secondary derivative content and responsive to receiving the request.

54. The method of claim 53, wherein the primary content includes any one from a group including an entertainment asset and an advertisement asset and wherein the simulated primary content includes anyone from a group including an accelerated speed entertainment asset and an accelerated speed advertisement asset.

55. The method of claim 53, wherein the secondary derivative content includes any one from a group including a programmatically generated entertainment slide show and a programmatically generated advertisement slide show.
56. The method of claim 53, wherein the output device includes a display device and a sound device.
57. The method of claim 53, wherein receiving the request to render the primary content to the output device at an accelerated speed for the primary content includes receiving a trick mode to request.
58. The method of claim 57, wherein the trick mode request includes any one from a group including a trick mode request to fast forward the primary content and a trick mode request to rewind the primary content.
59. The method of claim 58, further including communicating the trick mode request.
60. The method of claim 59, wherein the communicating the trick mode request includes utilizing any one from a group of protocols comprising the real time streaming protocol (RTSP) and the digital storage media command and control protocol (DSM-CC).
61. A method including:
receiving a transmission at a receiving device, the transmission including primary content and a secondary information identifier;
storing the transmission on a local storage device;
retrieving the transmission from the local storage device;
rendering the primary content to an output device at the receiving device at a normal speed for the primary content;
receiving a request to render the primary content to an output device at the receiving device at an accelerated speed of the primary content;

associating the primary content to secondary non-derivative content based on the secondary information identifier; and

rendering the secondary non-derivative content, instead of the primary content, to the output device at the receiving device, the secondary non-derivative content not being derived from the primary content, the rendering responsive to receiving the request.

62. The method of claim 61, wherein the request includes a trick mode request and wherein the trick mode request includes any one from a group of trick mode requests including a fast forward request and a rewind request.

63. The method of claim 61, wherein the output device includes a display device and a sound device.

64. The method of claim 61, wherein the secondary non-derivative content includes any one from a group including an entertainment recording, an advertisement recording, an entertainment slide show, and an advertisement slide show, entertainment recording metadata, advertisement recording metadata, entertainment slide show metadata and advertisement slide show metadata.

65. The method of claim 61, wherein associating the primary content to the secondary non-derivative content includes generating the secondary non-derivative content with a secondary application, wherein the secondary application includes any one from a group including an entertainment application and an advertisement application.

66. A method including:

receiving a transmission at a receiving device, the transmission including primary content and a secondary information identifier;

storing the transmission on a local storage device;

retrieving the transmission from the local storage device;

rendering the primary content to an output device at the receiving device at a normal speed for the primary content;

receiving a request to render the primary content to an output device at the receiving device at an accelerated speed of the primary content;
associating the primary content to secondary derivative content based on the secondary information identifier; and
rendering the secondary derivative content, instead of the primary content, to the output device at the receiving device at a normal speed for the secondary derivative content, the rendering responsive to receiving the request, the secondary derivative content being derived from the primary content.

67. The method of claim 66, wherein associating the primary content to the secondary derivative content includes generating the secondary derivative content based on secondary metadata and the primary content.

68. The method of claim 66, wherein the generating the secondary derivative content includes identifying reference frames in the primary content based on the secondary metadata.

69. The method of claim 66, wherein the generating the secondary derivative content includes adding fade-ins and fade-outs to the reference frames.

70. The method of claim 66, wherein associating the primary content to the secondary derivative content includes retrieving secondary information based on the secondary information identifier, wherein the secondary information identifier includes a universal resource locator that identifies the secondary information on a storage device, wherein the storage device is accessed via a remote server based on the universal resource locator.

71. The method of claim 66 wherein the transmission includes a stream from any one of a group of streams including an MPEG-2 compression stream, an MPEG-4 compression stream and a VC1 compression stream, wherein the stream is embedded in a transport that includes any one of a group of transports including an MPEG transport and an IP transport.

72. A method including:
generating a transmission that includes primary content and a secondary information identifier; and
communicating the transmission to a receiving device that stores the transmission in a local storage device, retrieves the transmission from the local storage device, and utilizes the secondary information identifier to associate the primary content to a secondary non-derivative content, the secondary non-derivative content not being derived from the primary content, the receiving device to render the secondary non-derivative content, instead of the primary content, to an output device at the receiving device responsive to receipt of a request to render the primary content to the output device at an accelerated speed of the normal content.

73. The method of claim 72, wherein the secondary non-derivative content includes content any one from a group including an entertainment recording, an advertisement recording, an entertainment slide show, and an advertisement slide show, entertainment recording metadata, advertisement recording metadata, entertainment slide show metadata, advertisement slide show metadata, an entertainment application, and an advertisement application.

74. The method of claim 72, wherein the primary content includes any one from a group including an entertainment asset and advertisement asset.

75. The method of claim 72, wherein the transmission includes any one from a group of transport streams comprising an MPEG-2 transport stream, an MPEG-4 transport stream, and a VC1 transport stream, wherein the stream is embedded in a transport that includes any one of a group of transports including an MPEG transport and an IP transport.

76. A method including:
generating a transmission that includes primary content and a secondary information identifier; and
communicating the transmission to a receiving device that stores the transmission in a local storage device, retrieves the transmission from the local

storage device, and utilizes the secondary information identifier to associate the primary content to a secondary derivative content, the secondary derivative content being derived from the primary content, the receiving device to render the secondary derivative content, instead of the primary content, to an output device at the receiving device at a normal speed of the secondary derivative content responsive to receipt of a request to render the primary content to the output device at the receiving device at an accelerated speed of the normal content.

77. The method of claim 76, wherein the secondary information identifier includes a universal resource locator.

78. The method of claim 76, wherein the universal resource locator identifies a file on a remote storage device.

79. A tangible machine readable medium storing a set of instructions that, when executed by a machine, cause the machine to:

- receive a request for primary content;
- communicate primary content to a receiving device, the receiving device to render the primary content to an output device at a normal speed of the primary content;
- associate the primary content to secondary information; and
- communicate the secondary information to the receiving device, the receiving device to utilize the secondary information to render secondary non-derivative content to the output device instead of the primary content, the secondary non-derivative content not being derived from the primary content, the receiving device to render the secondary non-derivative content responsive to receipt of a request at the receiving device to render the primary content at the receiving device at an accelerated speed of the primary content.

80. A tangible machine readable medium storing a set of instructions that, when executed by a machine, cause the machine to:

- receive a request for primary content;
- communicate primary content to a receiving device, the receiving device to render the primary content to an output device at a normal speed of the primary content;
- associate the primary content to secondary information; and
- communicate the secondary information to the receiving device, the receiving device to utilize the secondary information to render secondary derivative content to the output device at a normal speed for the secondary derivative content, the secondary derivative content being derived from the primary content, the receiving device to render the secondary derivative content instead of primary content responsive to receipt of a request at the receiving device to render the primary content at the receiving device at an accelerated speed of the primary content.

81. A tangible machine readable medium storing a set of instructions that, when executed by a machine, cause the machine to:

- receive a request for primary content;
- communicate primary content to a receiving device, the receiving device to render the primary content to an output device at a normal speed of the primary content;
- receive a request from the receiving device to communicate the primary content for rendering at the output device at the receiving device at an accelerated speed of the primary content;
- associate the primary content to secondary non-derivative content;
- communicate the secondary non-derivative content to the receiving device instead of the primary content, the secondary non-derivative content not being derived from the primary content, the communicating responsive to receiving the request, the receiving device to render the secondary non-derivative content to the output device.

82. A tangible machine readable medium storing a set of instructions that, when executed by a machine, cause the machine to:

- receive a request for primary content;
- communicate primary content to a receiving device, the receiving device to render the primary content to an output device at a normal speed of the primary content;
- receive a request from the receiving device to communicate the primary content for rendering at the output device at the receiving device at an accelerated speed of the primary content;
- associate the primary content to secondary derivative content;
- communicate the secondary derivative content to the receiving device instead of the primary content responsive to receiving the request, the secondary derivative content being derived from the primary content, the receiving device to render the secondary derivative content to the output device at a normal speed for the secondary derivative content.

83. A tangible machine readable medium storing a set of instructions that, when executed by a machine, cause the machine to:

- receive primary content at a receiving device, the primary content for render to an output device at the receiving device at a normal speed for the primary content;
- receive a request to render the primary content to the output device at an accelerated speed for the primary content;
- receive a simulated primary content at the receiving device, the simulated primary content for render to the output device at the receiving device so as to simulate render of the primary content to the output device at the receiving device at an accelerated speed;
- generate secondary derivative content based on the simulated primary content; and
- render the secondary derivative content to the output device instead of the simulated primary content, the rendering the secondary derivative content at a normal speed for the secondary derivative content and responsive to receiving the request.

84. A tangible machine readable medium storing a set of instructions that, when executed by a machine, cause the machine to:

- receive a transmission at a receiving device, the transmission including primary content and a secondary information identifier;
- store the transmission on a local storage device;
- retrieve the transmission from the local storage device;
- render the primary content to an output device at the receiving device at a normal speed for the primary content;
- receive a request to render the primary content to an output device at the receiving device at an accelerated speed of the primary content;
- associate the primary content to secondary non-derivative content based on the secondary information identifier; and
- render the secondary non-derivative content, instead of the primary content, to the output device at the receiving device, the secondary non-derivative content not being derived from the primary content, the rendering responsive to receiving the request.

85. A tangible machine readable medium storing a set of instructions that, when executed by a machine, cause the machine to:

- receive a transmission at a receiving device, the transmission including primary content and a secondary information identifier;
- store the transmission on a local storage device;
- retrieve the transmission from the local storage device;
- render the primary content to an output device at the receiving device at a normal speed for the primary content;
- receive a request to render the primary content to an output device at the receiving device at an accelerated speed of the primary content;
- associate the primary content to secondary derivative content based on the secondary information identifier; and
- render the secondary derivative content, instead of the primary content, to the output device at the receiving device at a normal speed for the secondary derivative content, the rendering responsive to receiving the request, the secondary derivative content being derived from the primary content.

86. A tangible machine readable medium storing a set of instructions that, when executed by a machine, cause the machine to:

generate a transmission that includes primary content and a secondary information identifier; and

communicate the transmission to a receiving device that stores the transmission in a local storage device, retrieves the transmission from the local storage device, and utilizes the secondary information identifier to associate the primary content to a secondary non-derivative content, the secondary non-derivative content not being derived from the primary content, the receiving device to render the secondary non-derivative content, instead of the primary content, to an output device at the receiving device responsive to receipt of a request to render the primary content to the output device at an accelerated speed of the normal content.

87. A tangible machine readable medium storing a set of instructions that, when executed by a machine, cause the machine to:

generate a transmission that includes primary content and a secondary information identifier; and

communicate the transmission to a receiving device that stores the transmission in a local storage device, retrieves the transmission from the local storage device, and utilizes the secondary information identifier to associate the primary content to a secondary derivative content, the secondary derivative content being derived from the primary content, the receiving device to render the secondary derivative content, instead of the primary content, to an output device at the receiving device at a normal speed of the secondary derivative content responsive to receipt of a request to render the primary content to the output device at the receiving device at an accelerated speed of the normal content.

88. A system including:
a first means to generate a transmission that includes primary content and a secondary information identifier; and
a second means to communicate the transmission to a receiving device that stores the transmission in a local storage device, retrieves the transmission from the local storage device, and utilizes the secondary information identifier to associate the primary content to a secondary derivative content, the secondary derivative content being derived from the primary content, the receiving device to render the secondary derivative content, instead of the primary content, to an output device at the receiving device at a normal speed of the secondary derivative content responsive to receipt of a request to render the primary content to the output device at the receiving device at an accelerated speed of the normal content.

ABSTRACT

Systems and methods to modify playout or playback include a first and second approach to respond to a trick mode request (e.g., fast forward, rewind). First, a trick mode request may be responded to by associating primary content to secondary content and playing out the secondary content on a receiving device, the secondary content not being derived from the primary content. Second, a trick mode request may be responded to by associating primary content to secondary content and playing out the secondary content on a receiving device, the secondary content being derived from the primary content but played at a normal speed for the secondary content.

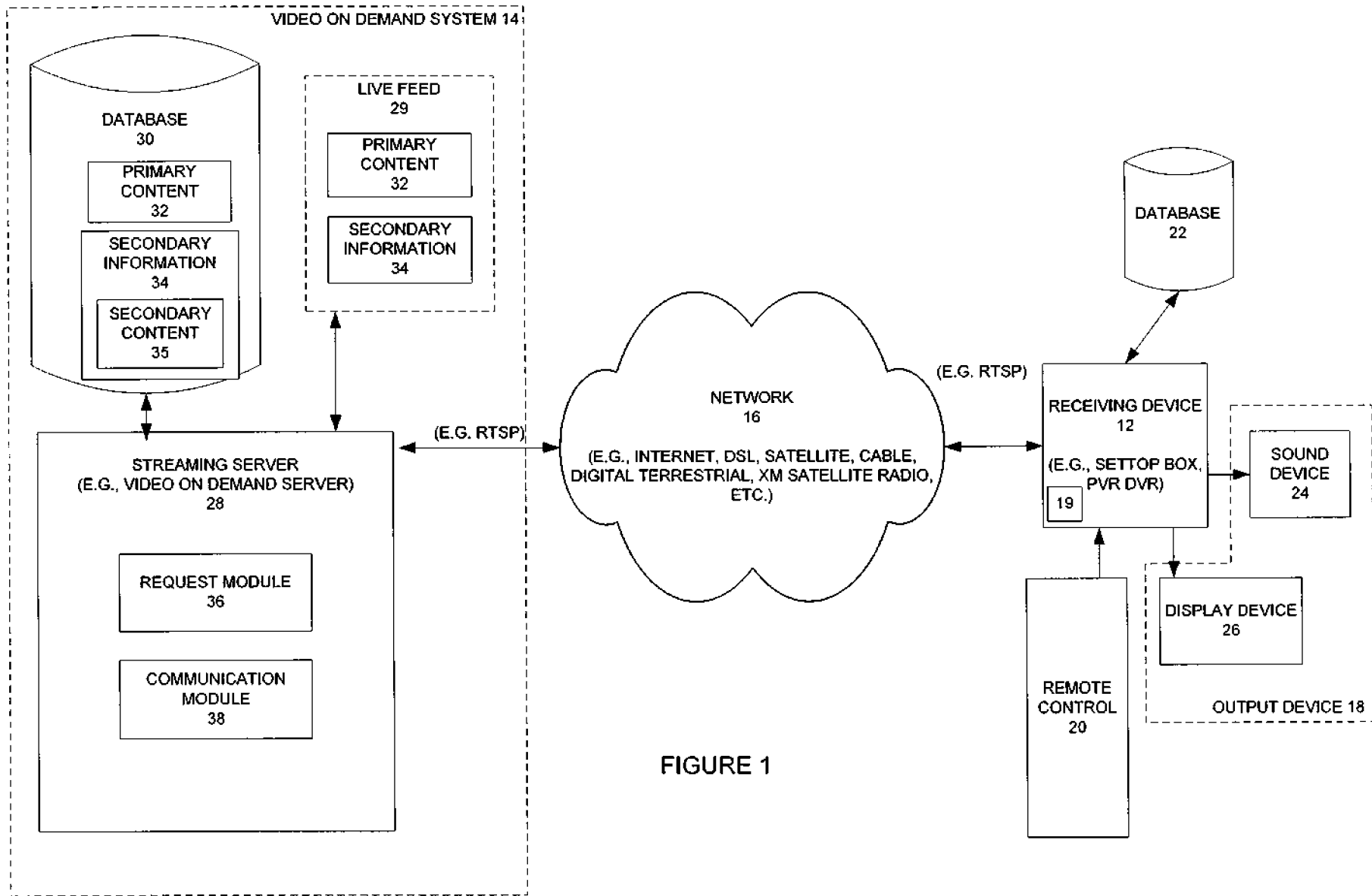


FIGURE 1

DATABASE 30

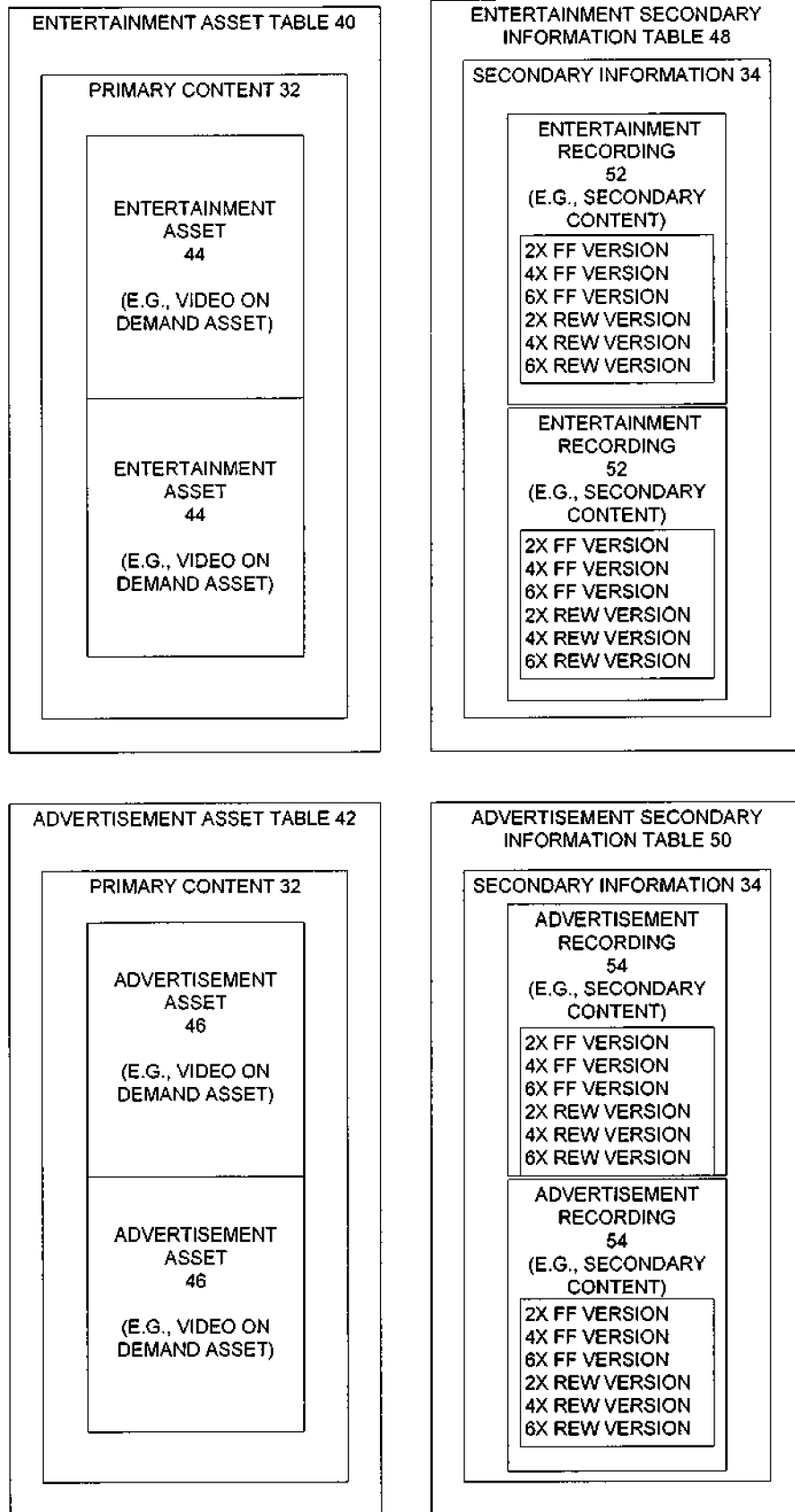


FIGURE 2

37

SECONDARY CONTENT 35
(e.g. DERIVATIVE AND NON DERIVATIVE)

SECONDARY METADATA 58

SECONDARY APPLICATION 60

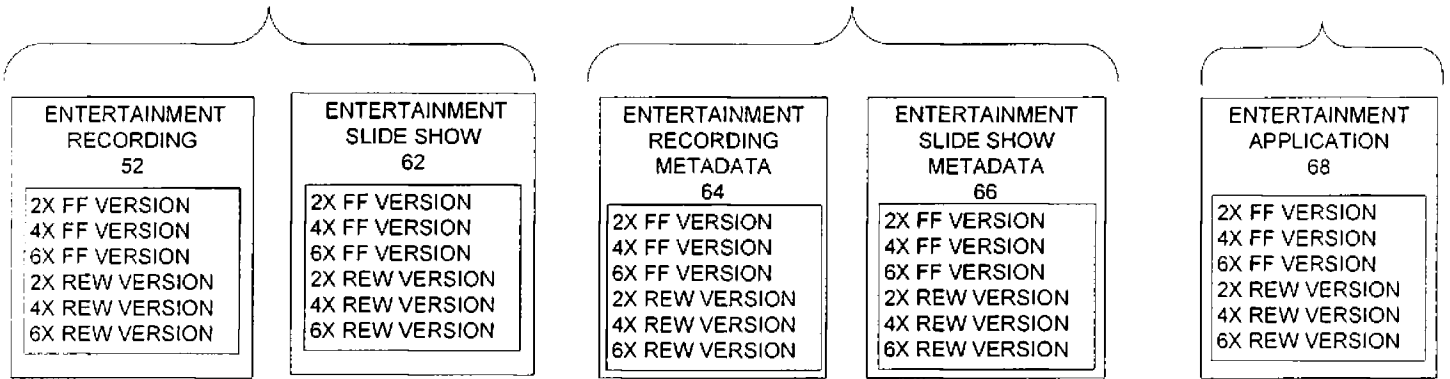


FIGURE 3

39

SECONDARY CONTENT 35
(e.g. DERIVATIVE AND NON DERIVATIVE)

SECONDARY METADATA 58

SECONDARY APPLICATION 60

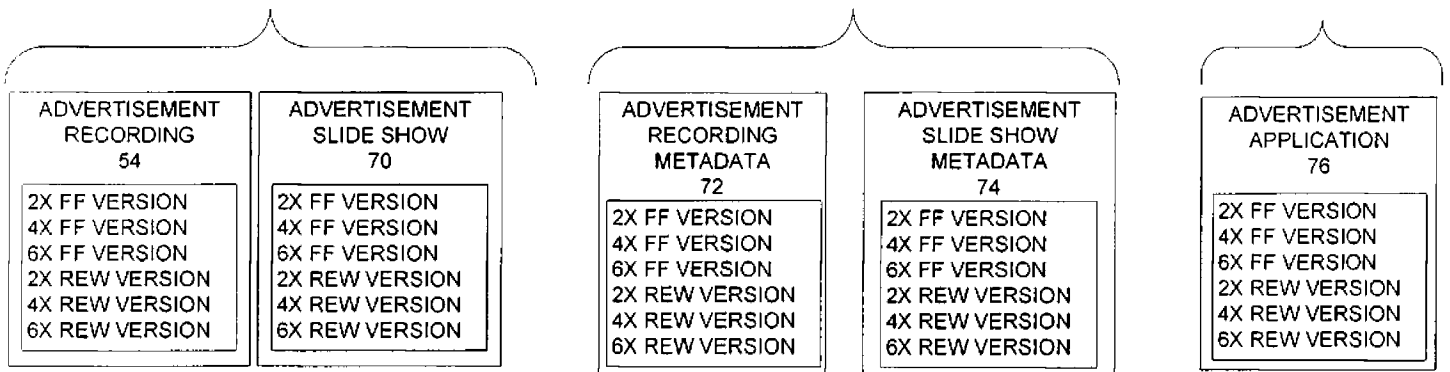


FIGURE 4

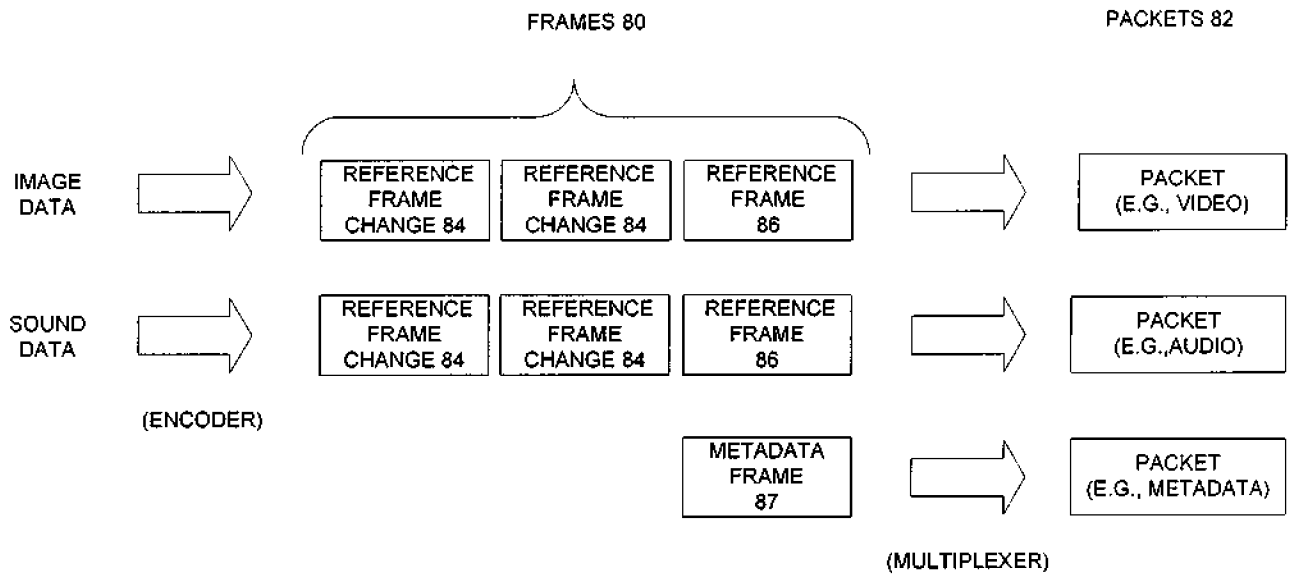


FIGURE 5

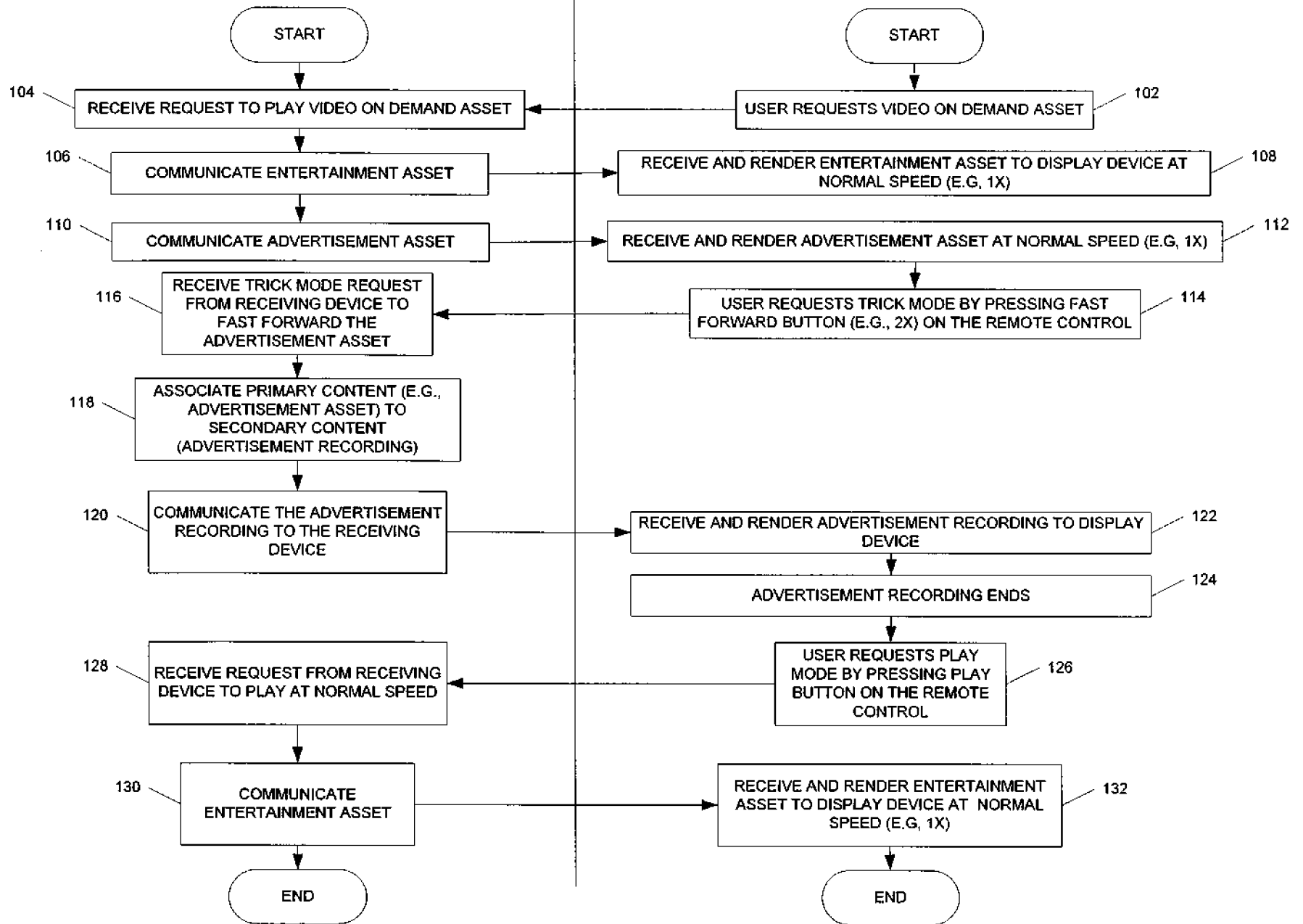


FIGURE 6

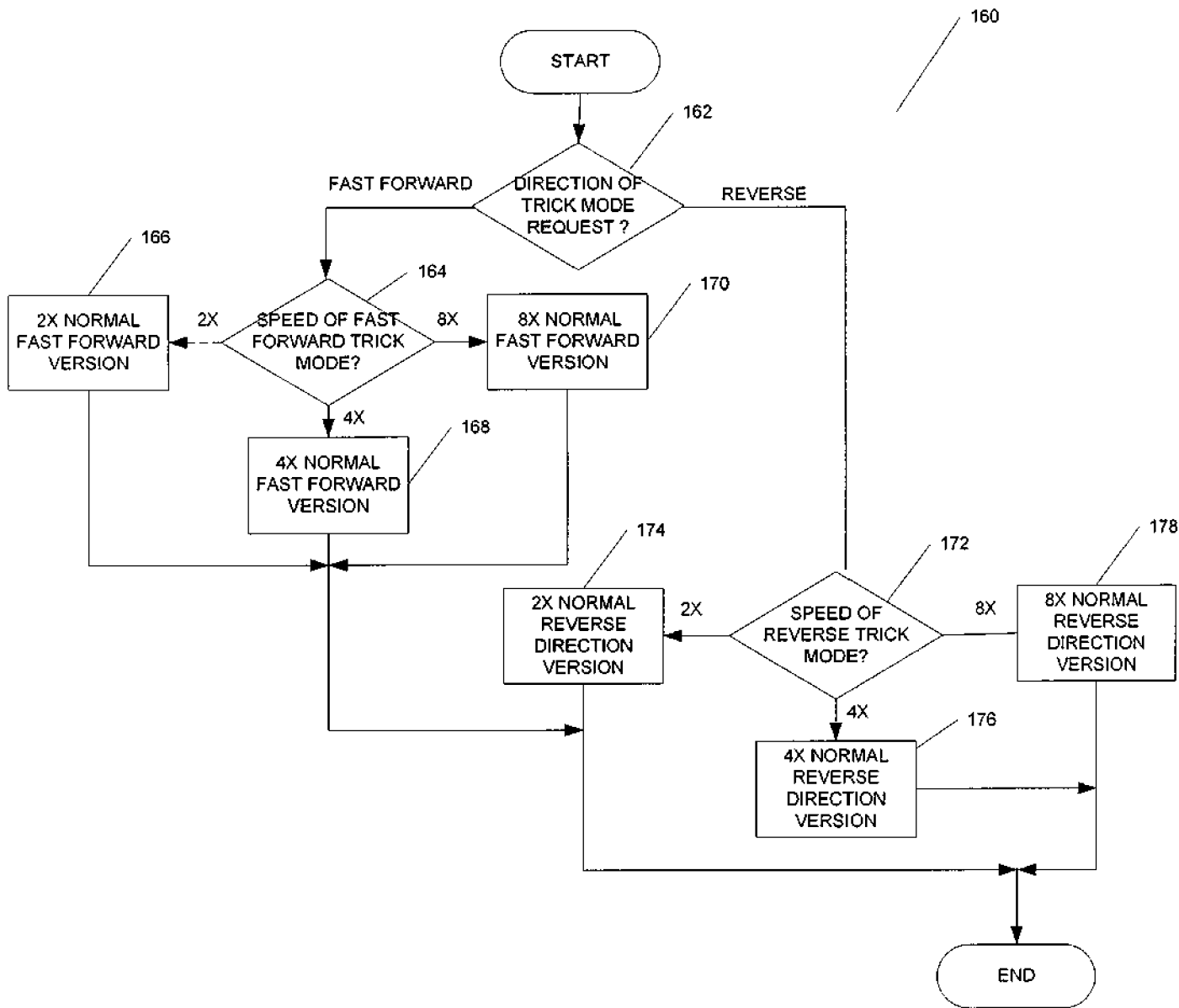


FIGURE 7

STREAMING SERVER 28

RECEIVING DEVICE 12

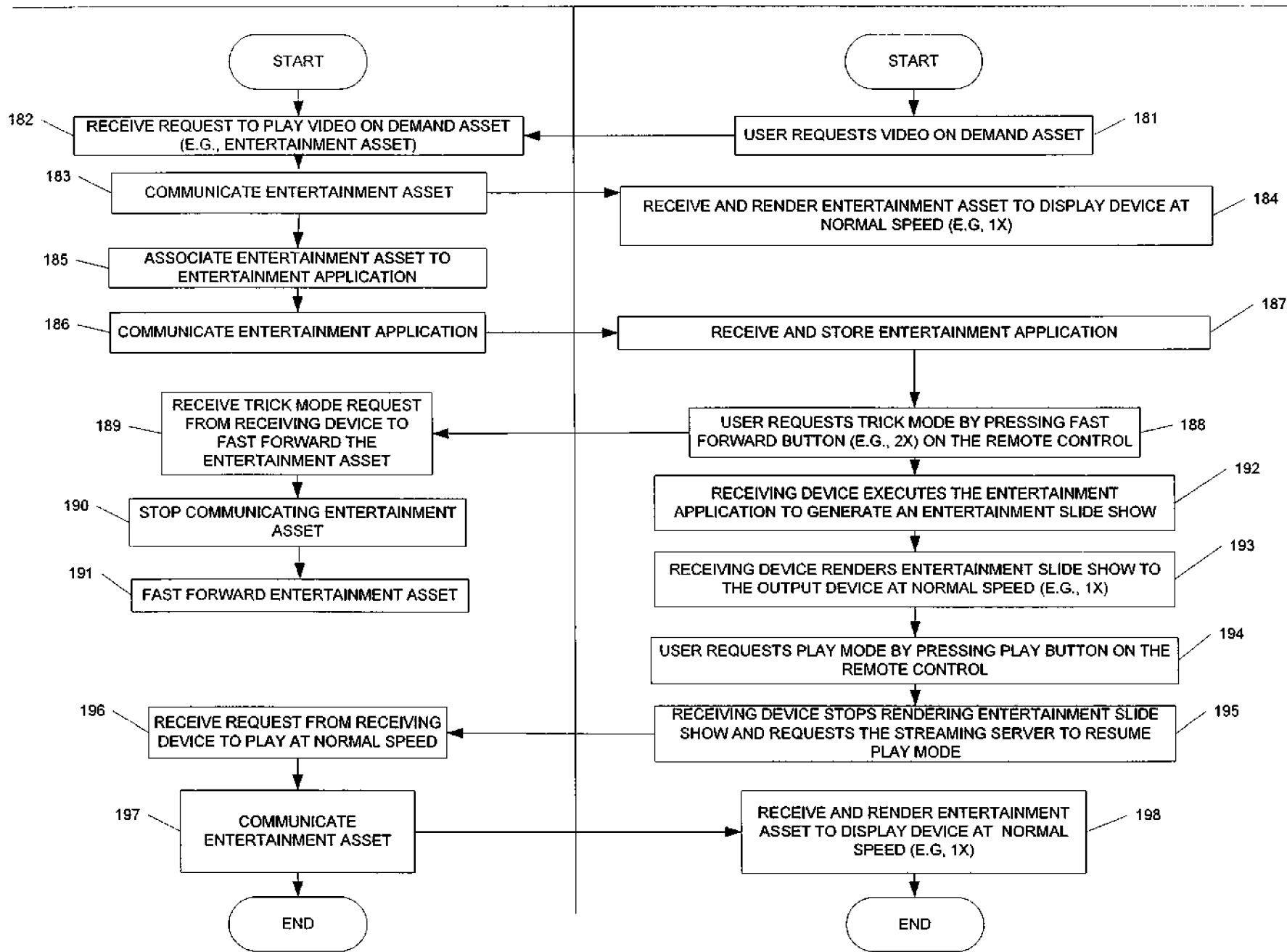


FIGURE 8

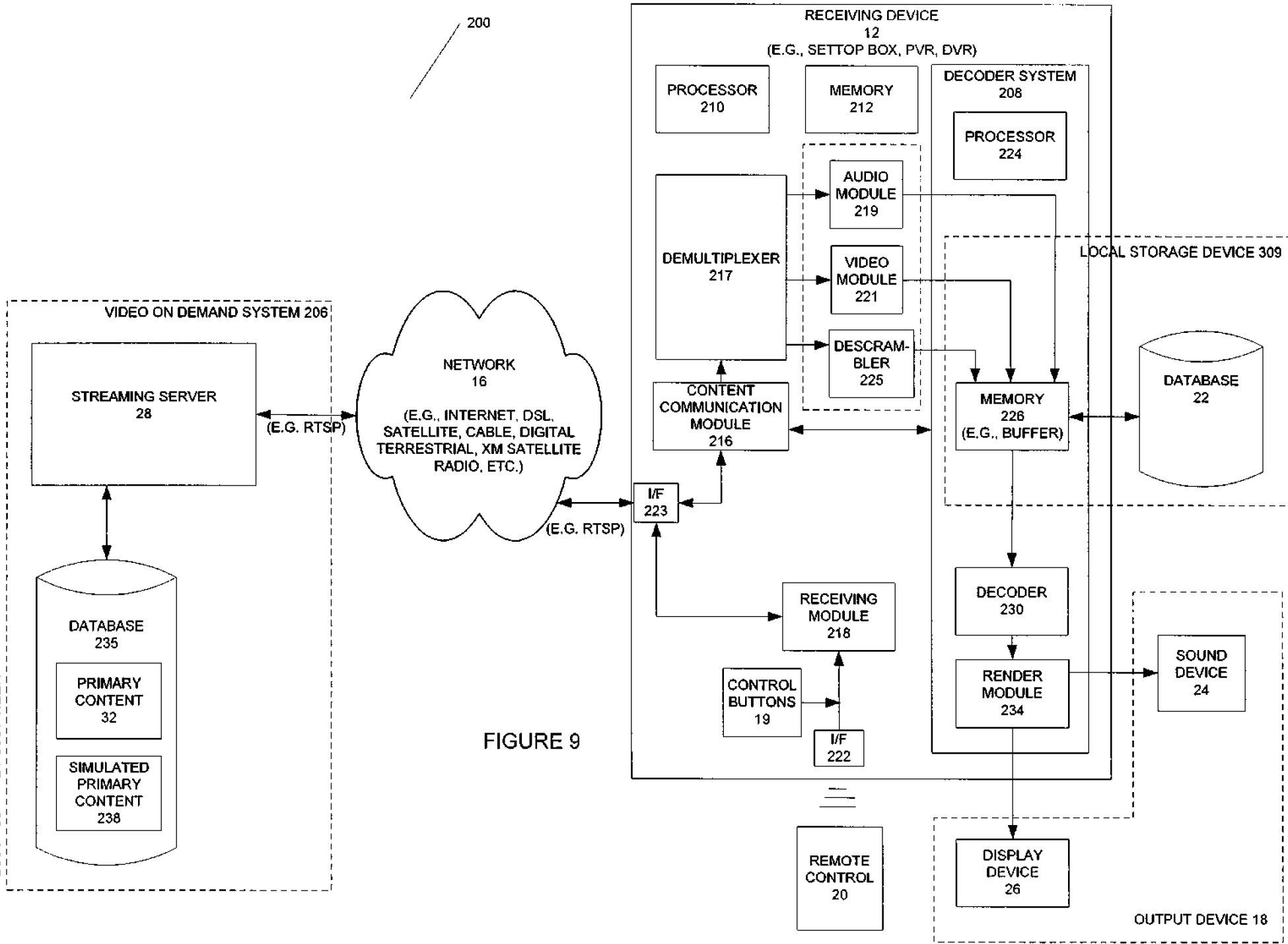


FIGURE 9

DATABASE
235

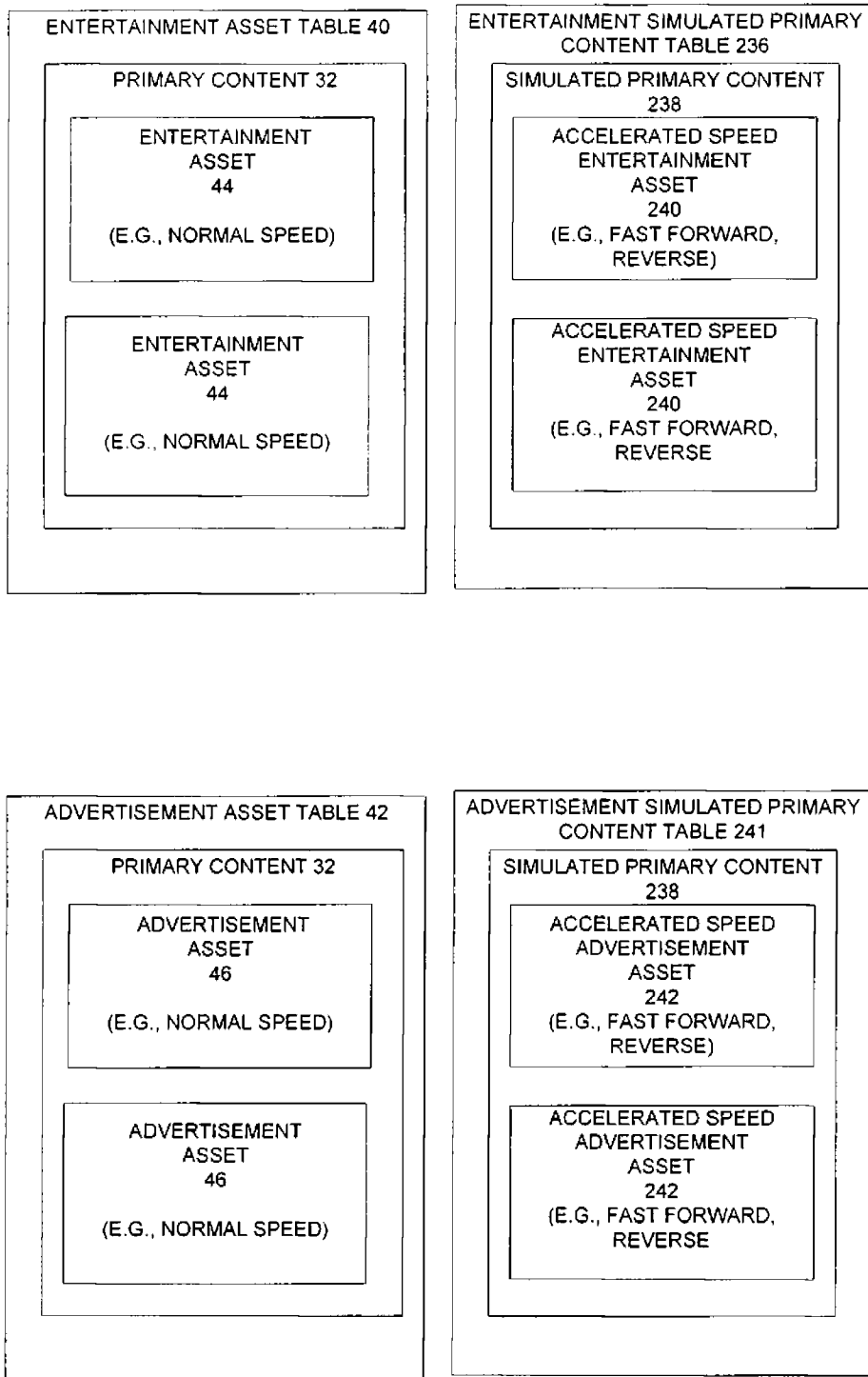


FIGURE 10

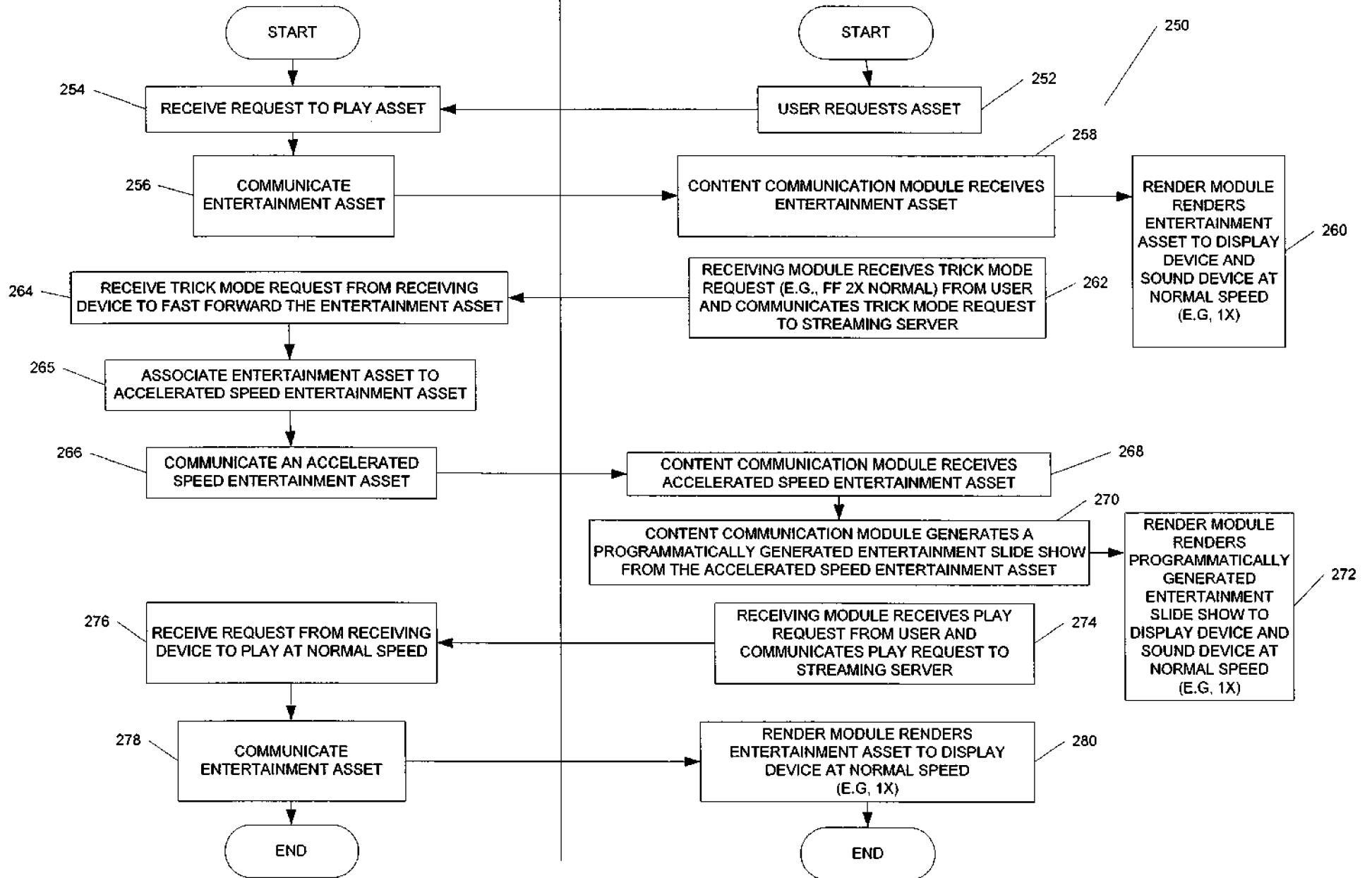


FIGURE 11

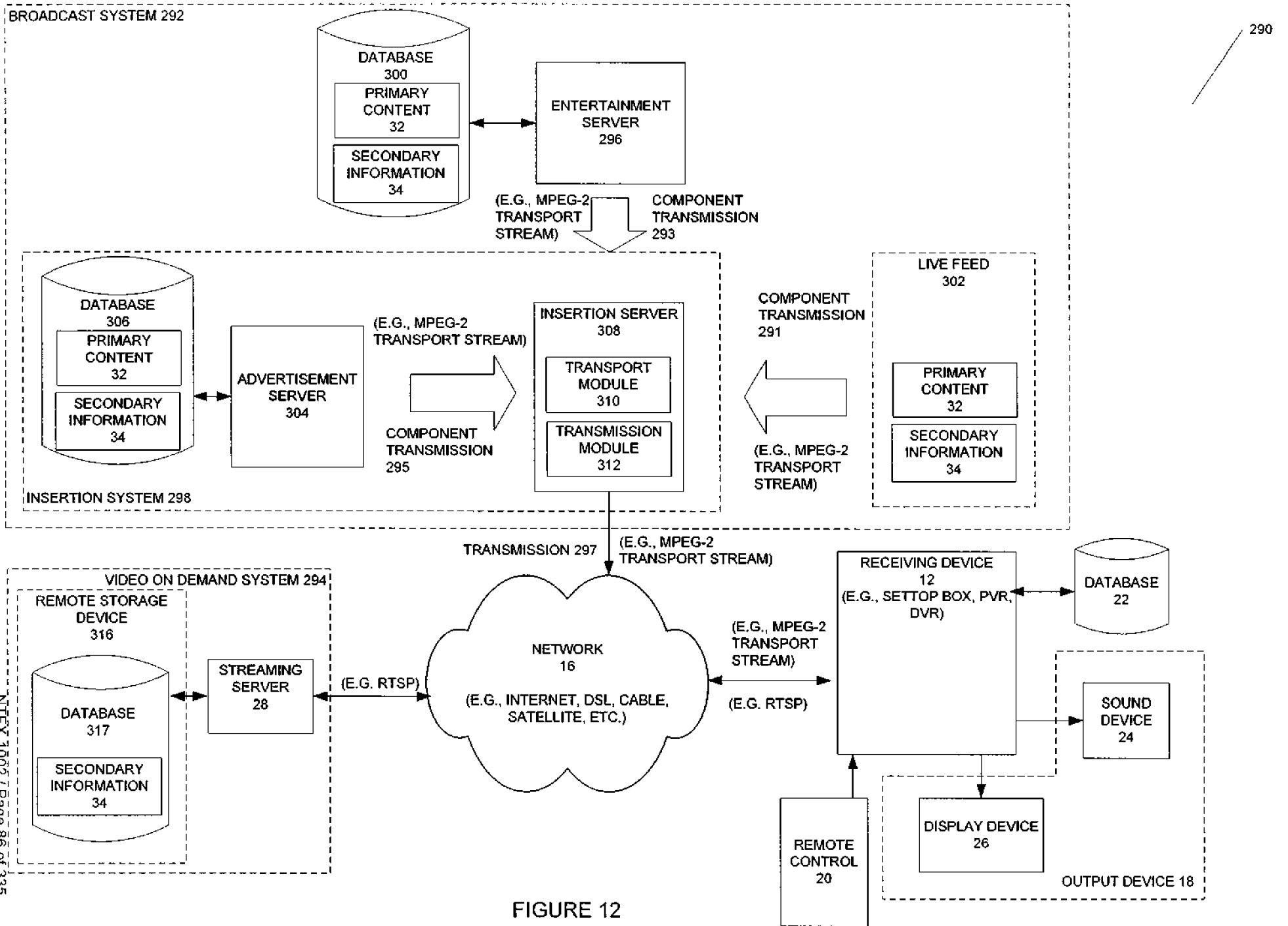


FIGURE 12

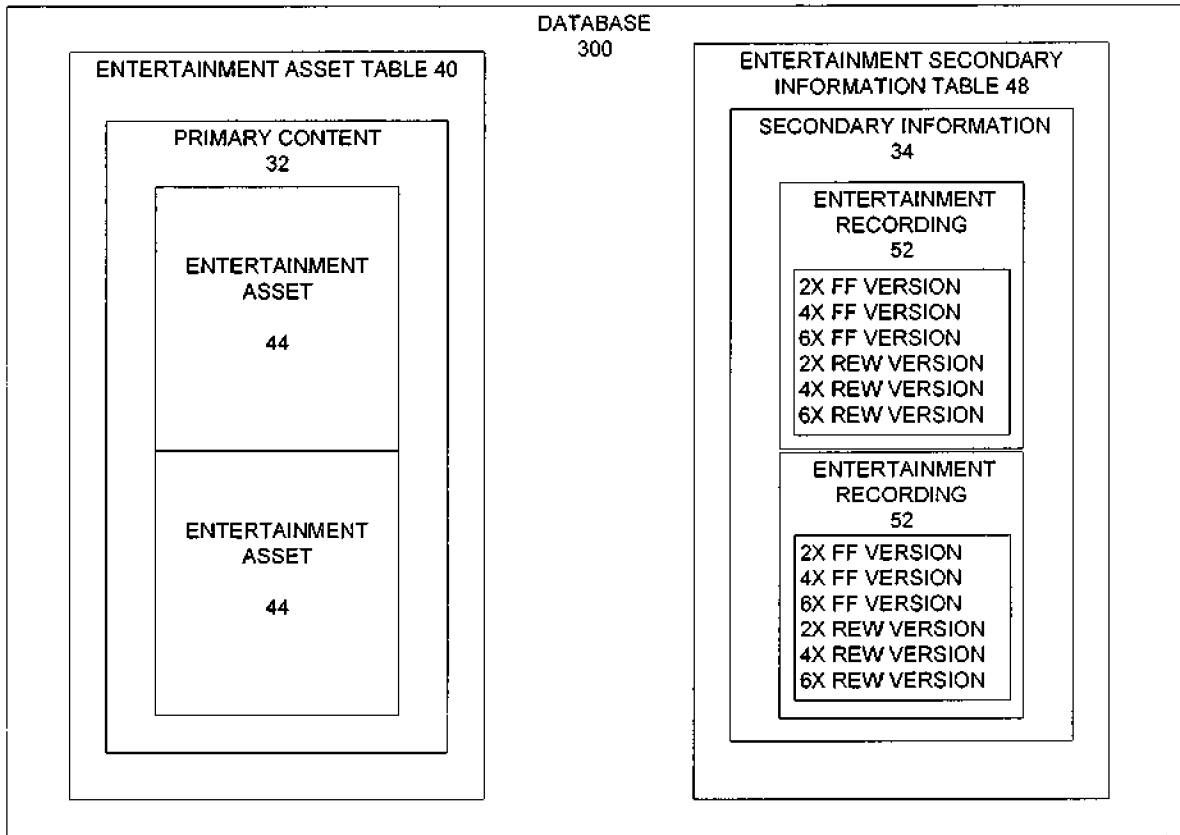


FIGURE 13

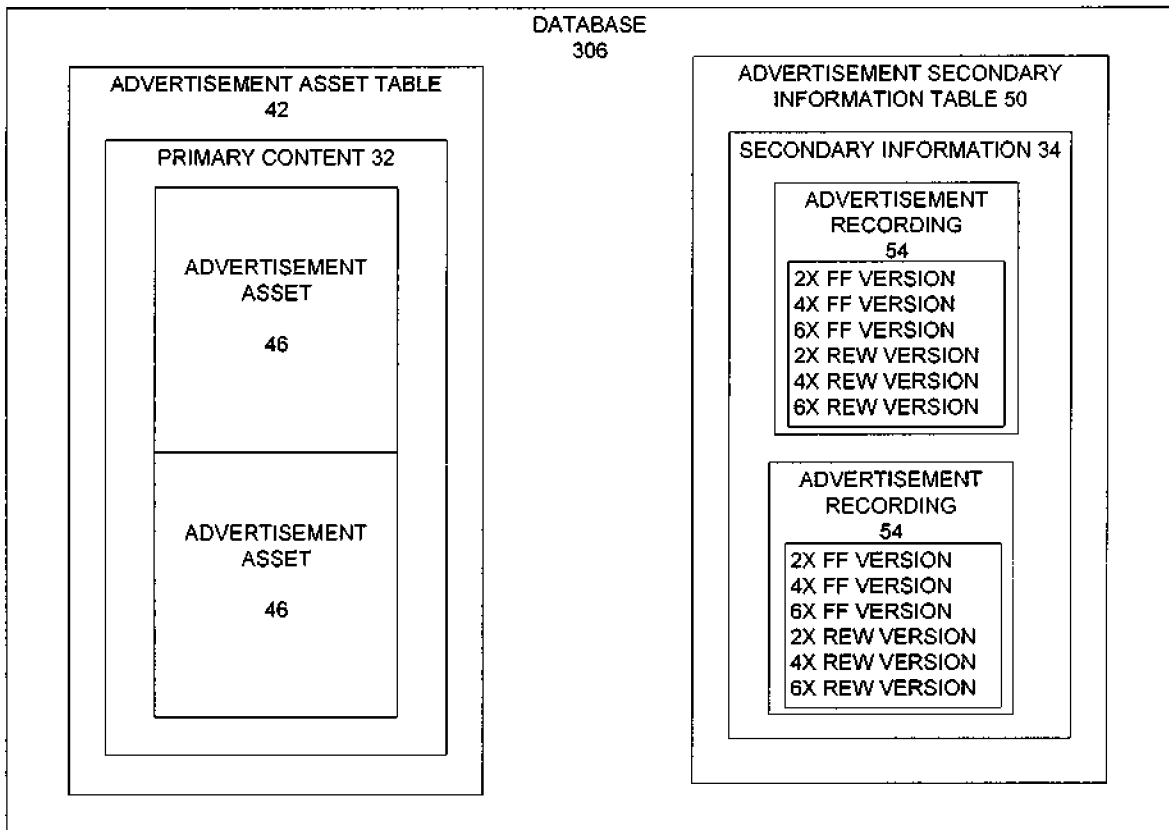


FIGURE 14

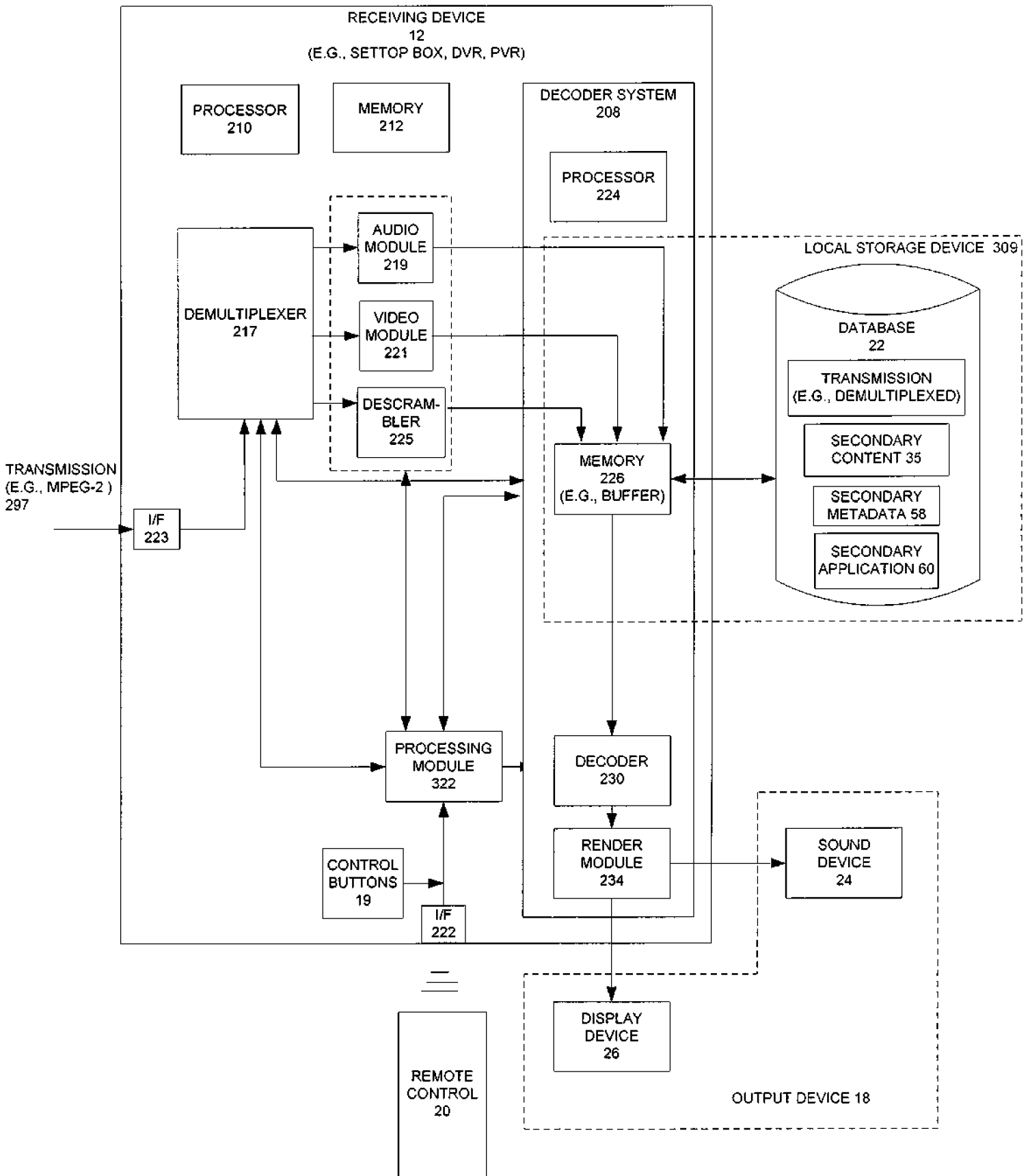


FIGURE 15

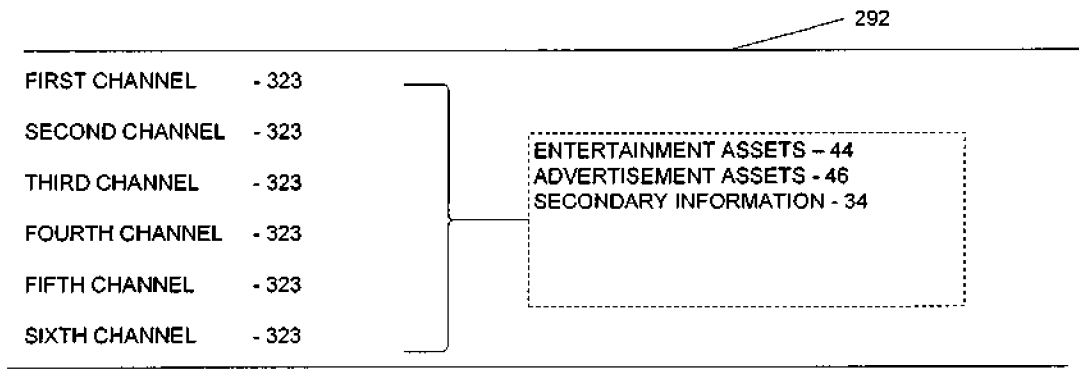


FIGURE 16A

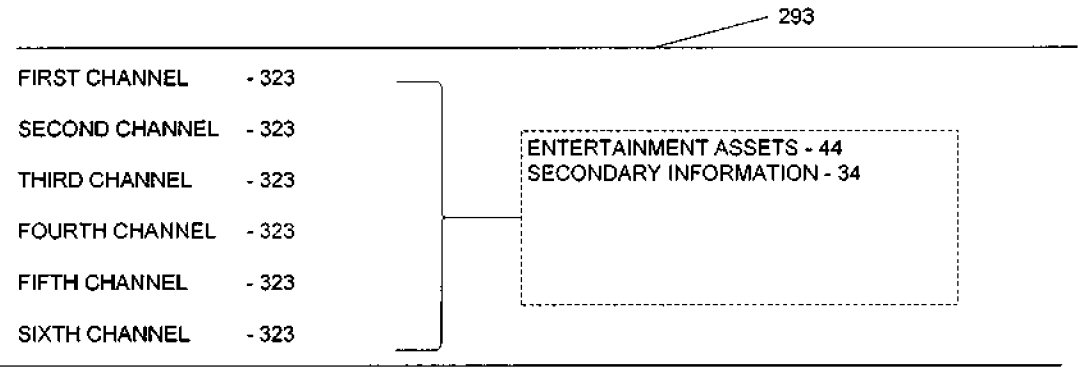


FIGURE 16A

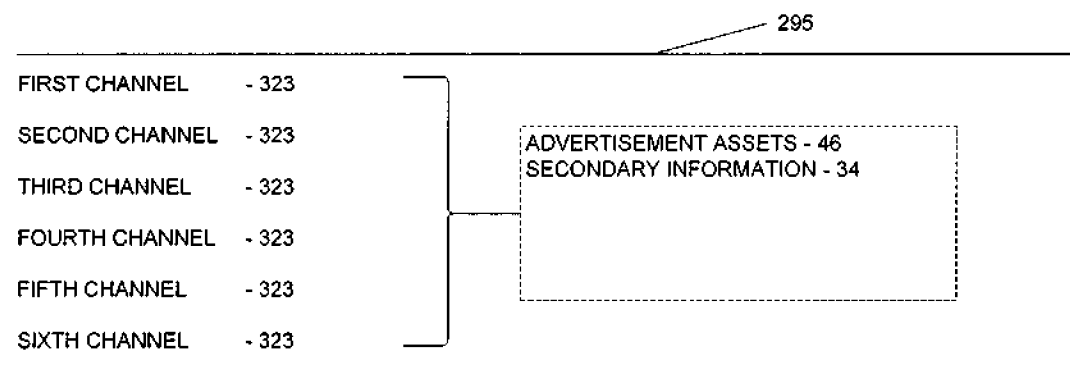


FIGURE 16B

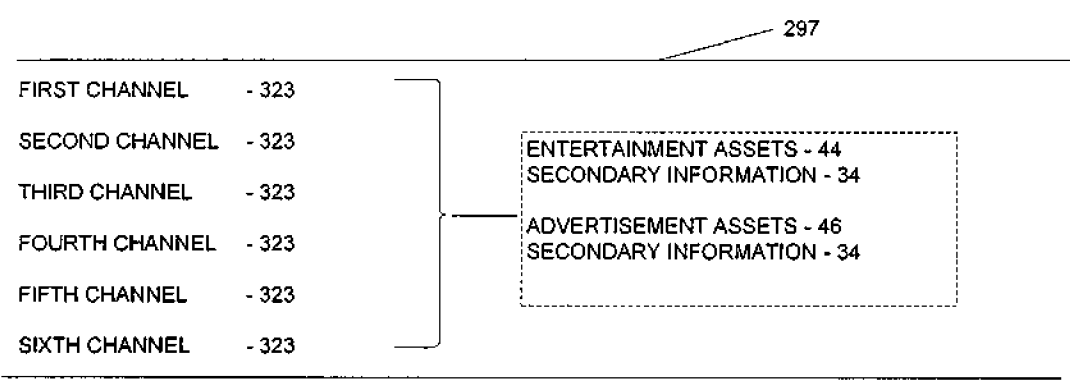


FIGURE 16C

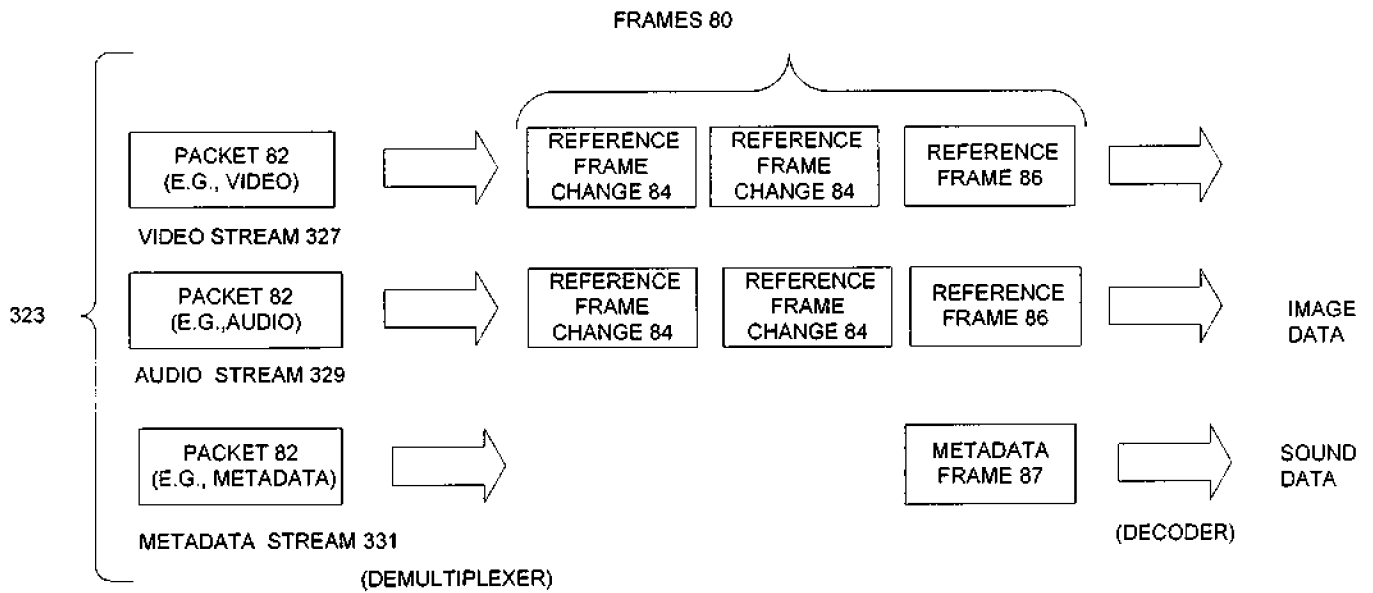


FIGURE 17

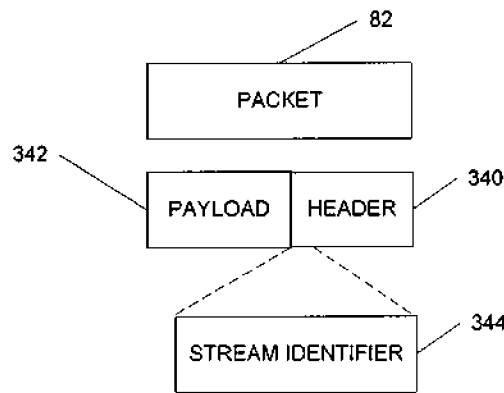


FIGURE 18

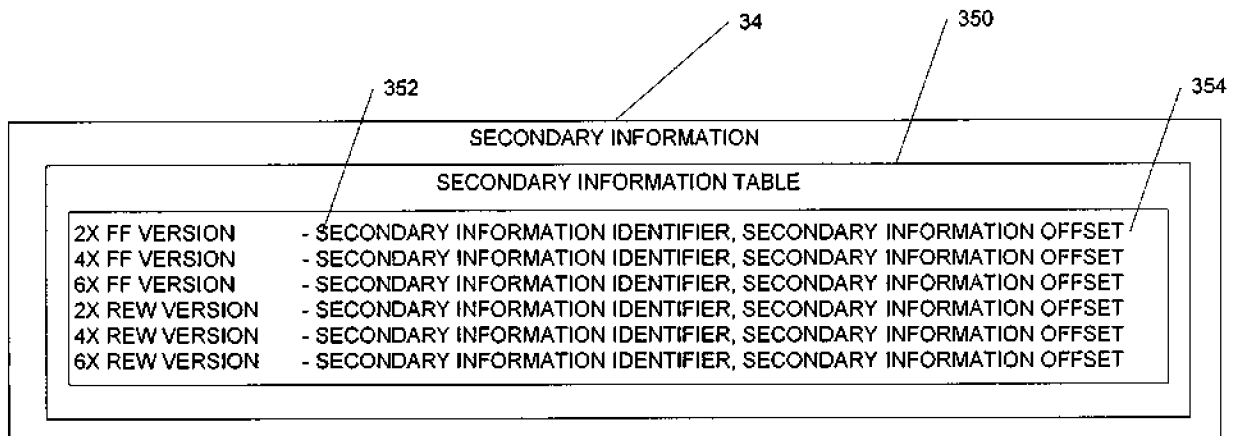


FIGURE 19

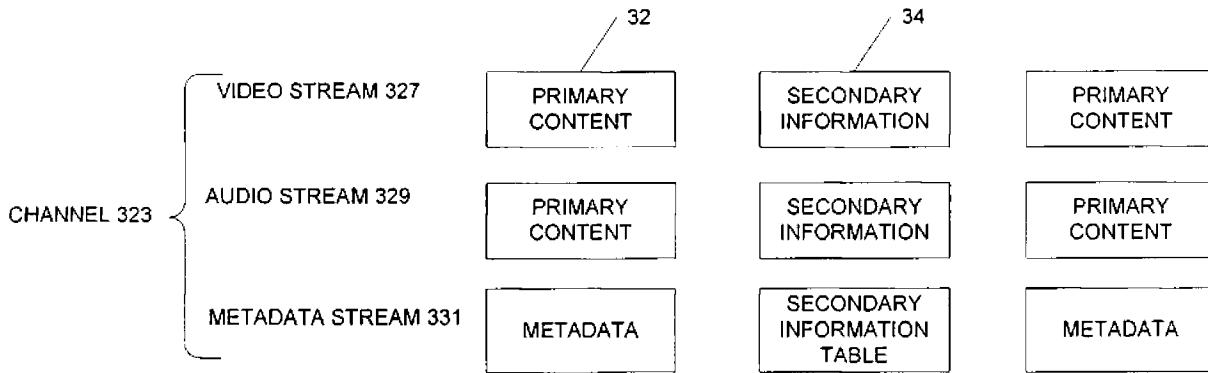


FIGURE 20

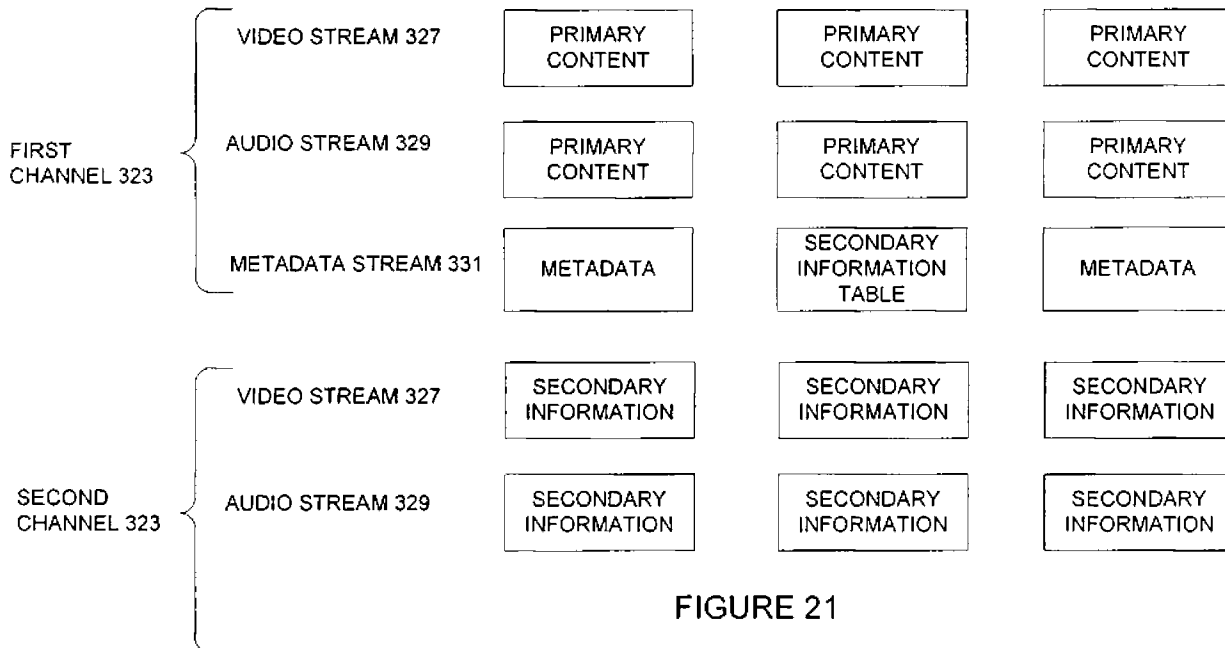


FIGURE 21

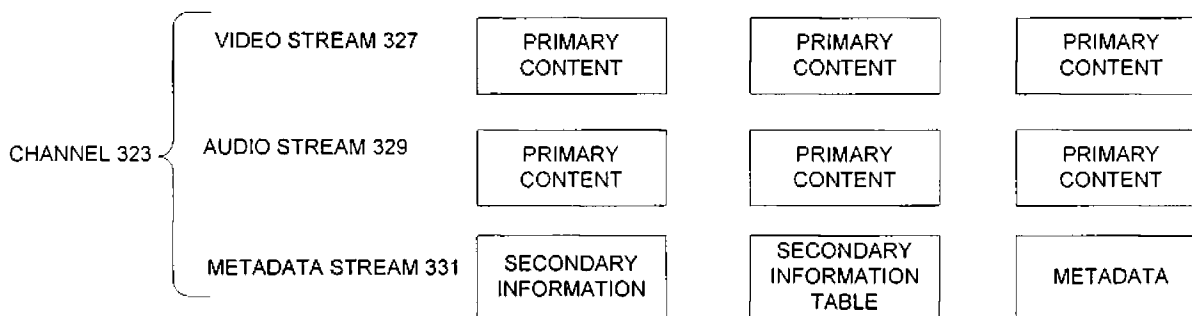


FIGURE 22

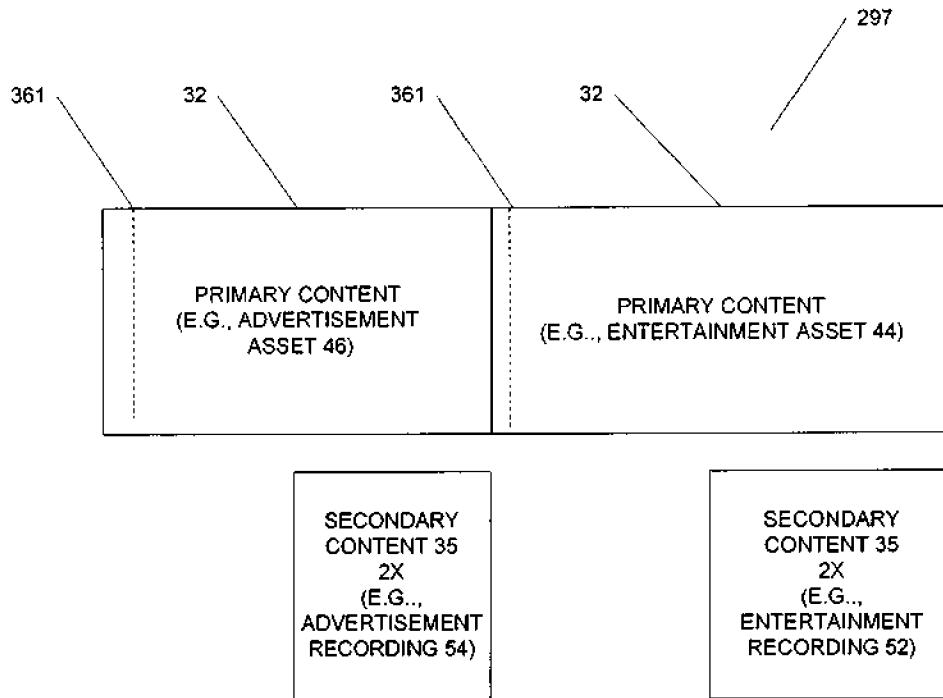


FIGURE 23

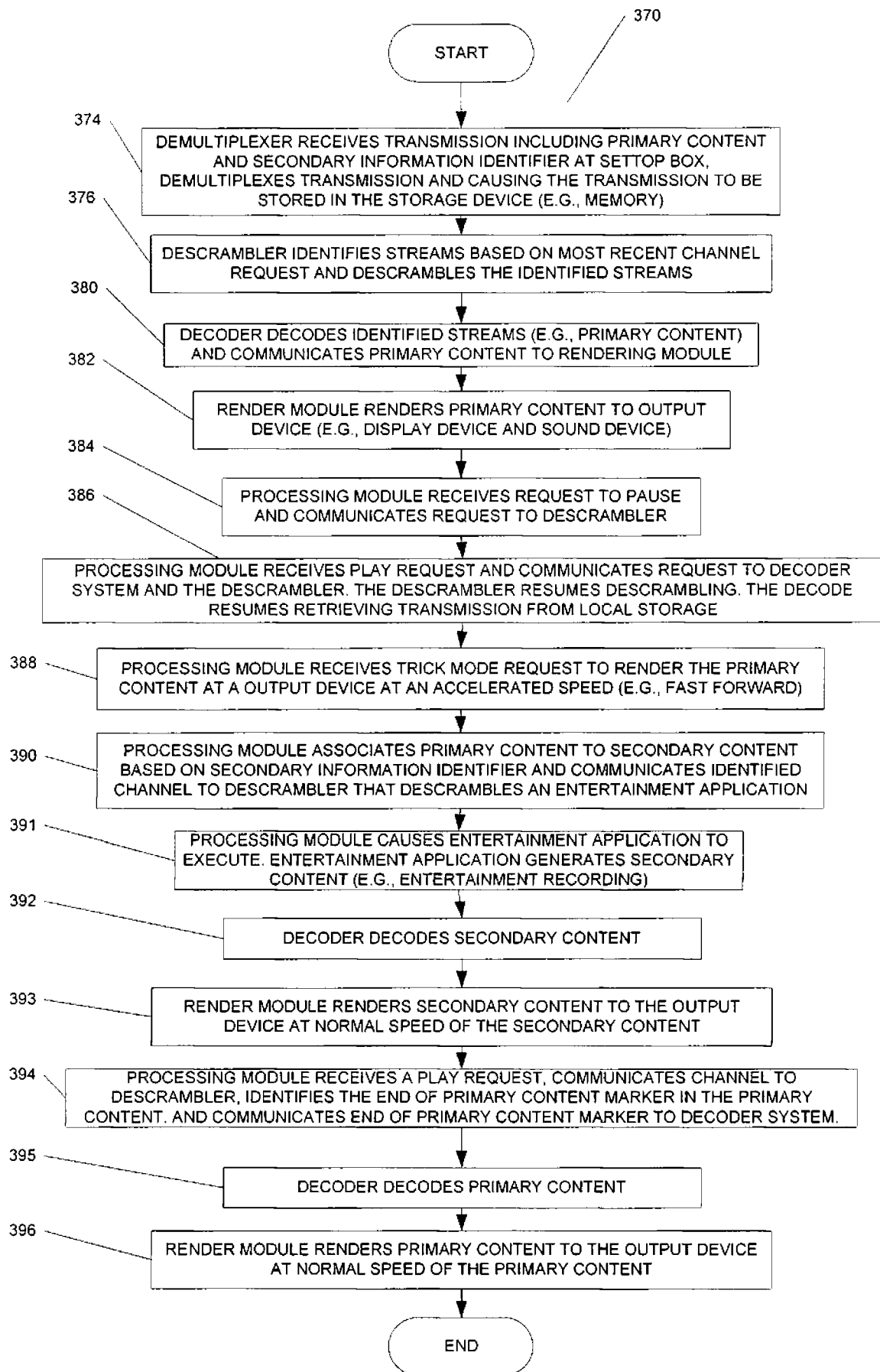


FIGURE 24

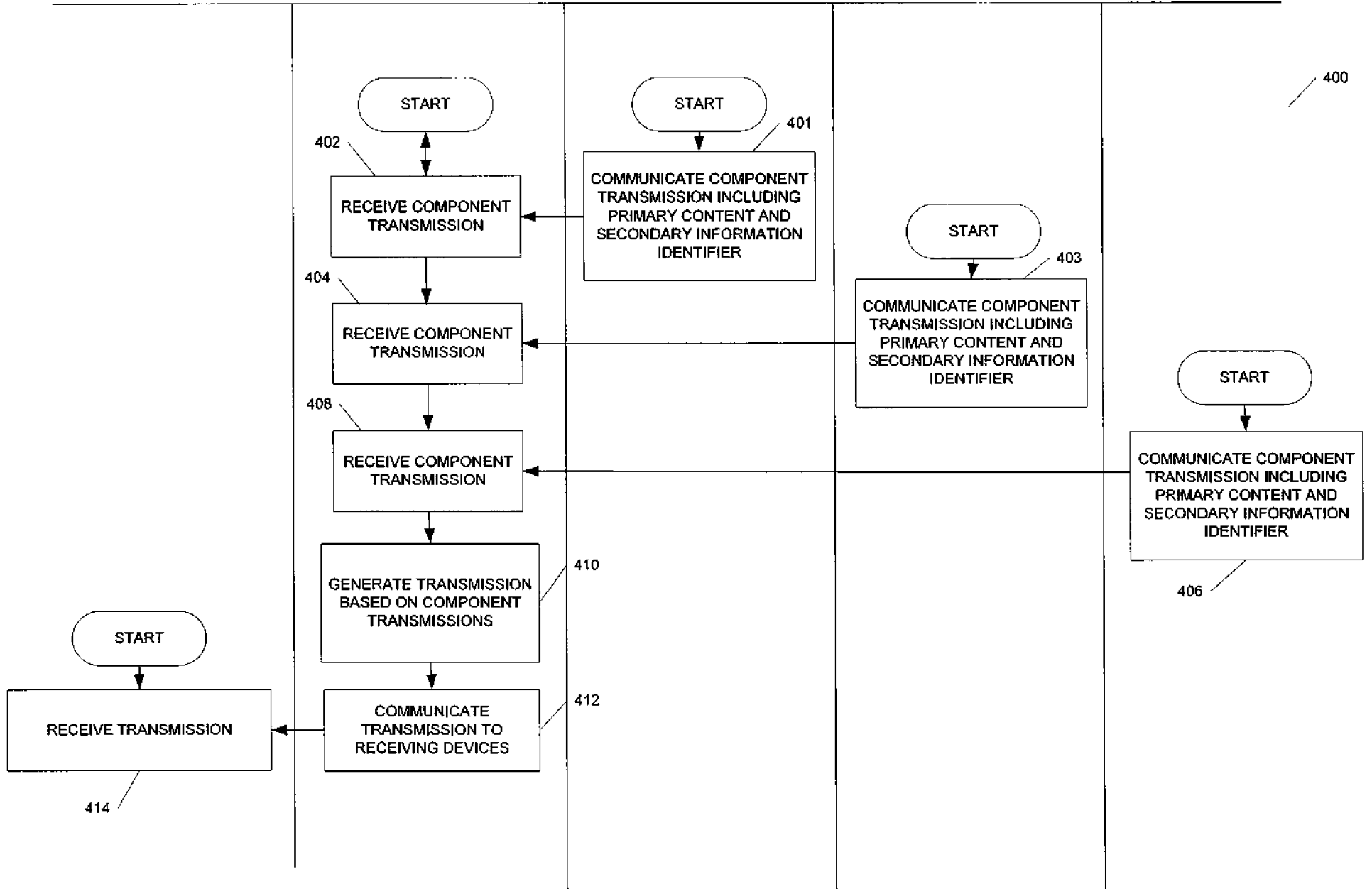


FIGURE 25



FIGURE 26

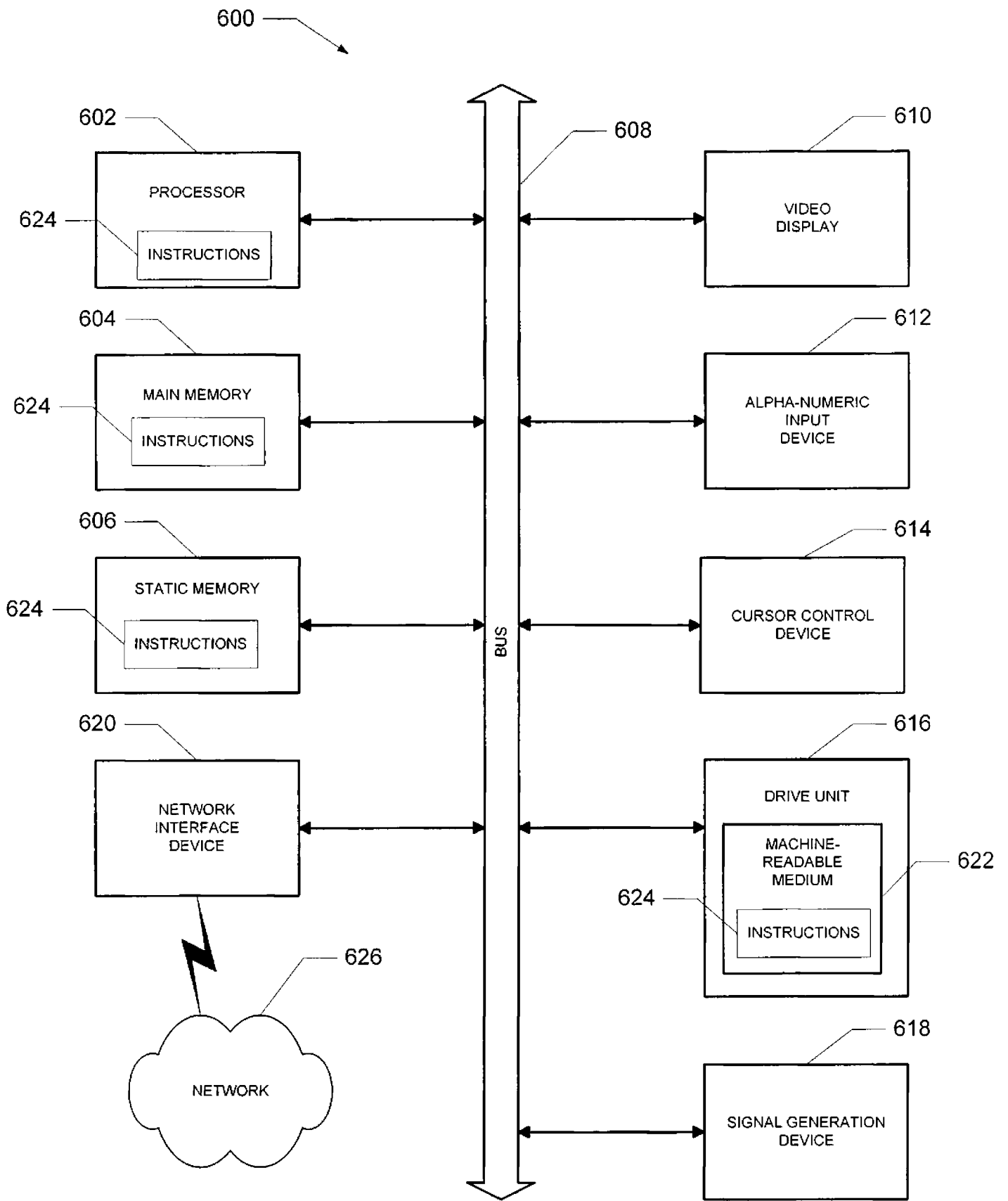


FIGURE 27

SCHWEGMAN ■ LUNDBERG ■ WOESSNER ■ KLUTH

United States Patent Application
COMBINED DECLARATION AND POWER OF ATTORNEY

As a below named inventor I hereby declare that: my residence, post office address and citizenship are as stated below next to my name; that

I verily believe I am the original, sole inventor of the subject matter which is claimed and for which a patent is sought on the invention entitled: **SYSTEMS AND METHODS TO MODIFY PLAYOUT OR PLAYBACK**,

the specification of which is attached hereto.

I hereby state that I have reviewed and understand the contents of the above-identified specification, including the claims, as amended by any amendment referred to above.

I acknowledge the duty to disclose information which is material to the patent ability of this application in accordance with 37 C.F.R. § 1.56 (attached hereto). I also acknowledge my duty to disclose all information known to be material to patent ability which became available between a filing date of a prior application and the national or PCT international filing date in the event this is a Continuation-In-Part application in accordance with 37 C.F.R. § 1.63(e).

I hereby claim foreign priority benefits under 35 U.S.C. § 119(a)-(d) or 365(b) of any foreign application(s) for patent or inventor's certificate, or 365(a) of any PCT international application which designated at least one country other than the United States of America, listed below and have also identified below any foreign application for patent or inventor's certificate having a filing date before that of the application on the basis of which priority is claimed:

No such claim for priority is being made at this time.

I hereby claim the benefit under 35 U.S.C. § 119(e) of any United States provisional application(s) listed below:

No such claim for priority is being made at this time.

I hereby claim the benefit under 35 U.S.C. § 120 or 365(c) of any United States and PCT international application(s) listed below and, insofar as the subject matter of each of the claims of this application is not disclosed in the prior United States or PCT international application in the manner provided by the first paragraph of 35 U.S.C. § 112, I acknowledge the duty to disclose material information as defined in 37 C.F.R. § 1.56(a) which became available between the filing date of the prior application and the national or PCT international filing date of this application:

No such claim for priority is being made at this time.

I hereby appoint the attorneys associated with the customer number listed below to prosecute this application and to transact all business in the Patent and Trademark Office connected herewith:

Customer Number: 44367

I hereby authorize them to act and rely on instructions from and communicate directly with the person/assignee/attorney/firm/organization/who/which first sends/sent this case to them and by whom/which I hereby declare that I have consented after full disclosure to be represented unless/until I instruct Schwegman, Lundberg, Woessner & Kluth, P.A. to the contrary.

Please direct all correspondence in this case to **Schwegman, Lundberg, Woessner & Kluth, P.A.** at the address indicated below:

Customer Number. 21186

I hereby declare that all statements made herein of my own knowledge are true and that all statements made on information and belief are believed to be true; and further that these statements were made with the knowledge that willful false statements and the like so made are punishable by fine or imprisonment, or both, under Section 1001 of Title 18 of the United States Code and that such willful false statements may jeopardize the validity of the application or any patent issued thereon.

Full Name of sole inventor : **Esteban Sardera**
Citizenship: **United States of America** Residence: **San Francisco, CA**
Post Office Address: **3700 Divisadero Street, #303**
San Francisco, CA 94123

Signature: _____ Date: _____
Esteban Sardera

§ 1.56 Duty to disclose information material to patentability.

(a) A patent by its very nature is affected with a public interest. The public interest is best served, and the most effective patent examination occurs when, at the time an application is being examined, the Office is aware of and evaluates the teachings of all information material to patentability. Each individual associated with the filing and prosecution of a patent application has a duty of candor and good faith in dealing with the Office, which includes a duty to disclose to the Office all information known to that individual to be material to patentability as defined in this section. The duty to disclose information exists with respect to each pending claim until the claim is canceled or withdrawn from consideration, or the application becomes abandoned. Information material to the patentability of a claim that is canceled or withdrawn from consideration need not be submitted if the information is not material to the patentability of any claim remaining under consideration in the application. There is no duty to submit information which is not material to the patentability of any existing claim. The duty to disclose all information known to be material to patentability is deemed to be satisfied if all information known to be material to patentability of any claim issued in a patent was cited by the Office or submitted to the Office in the manner prescribed by §§ 1.97(b)-(d) and 1.98. However, no patent will be granted on an application in connection with which fraud on the Office was practiced or attempted or the duty of disclosure was violated through bad faith or intentional misconduct. The Office encourages applicants to carefully examine:

- (1) prior art cited in search reports of a foreign patent office in a counterpart application, and
- (2) the closest information over which individuals associated with the filing or prosecution of a patent application believe any pending claim patentably defines, to make sure that any material information contained therein is disclosed to the Office.

(b) Under this section, information is material to patentability when it is not cumulative to information already of record or being made of record in the application, and

- (1) It establishes, by itself or in combination with other information, a prima facie case of unpatentability of a claim; or
- (2) It refutes, or is inconsistent with, a position the applicant takes in:
 - (i) Opposing an argument of unpatentability relied on by the Office, or
 - (ii) Asserting an argument of patentability.

A prima facie case of unpatentability is established when the information compels a conclusion that a claim is unpatentable under the preponderance of evidence, burden-of-proof standard, giving each term in the claim its broadest reasonable construction consistent with the specification, and before any consideration is given to evidence which may be submitted in an attempt to establish a contrary conclusion of patentability.

(c) Individuals associated with the filing or prosecution of a patent application within the meaning of this section are:

- (1) Each inventor named in the application;
- (2) Each attorney or agent who prepares or prosecutes the application; and
- (3) Every other person who is substantively involved in the preparation or prosecution of the application and who is associated with the inventor, with the assignee or with anyone to whom there is an obligation to assign the application.

(d) Individuals other than the attorney, agent or inventor may comply with this section by disclosing information to the attorney, agent, or inventor.

Under the Paperwork Reduction Act of 1995, no persons are required to respond to a collection of information unless it displays a valid OMB control number.

REQUEST AND CERTIFICATION UNDER 35 U.S.C. 122(b)(2)(B)(i)	First Named Inventor	Esteban Sardera
	Title	SYSTEMS AND METHODS TO MODIFY PLAYOUT OR PLAYBACK
	Atty Docket Number	2050.053US1

I hereby certify that the invention disclosed in the attached application **has not and will not be** the subject of an application filed in another country, or under a multilateral agreement, that requires publication at eighteen months after filing. I hereby request that the attached application not be published under 35 U.S.C. 122(b).

E. 31. 2006

Date

Mark R. Vatuone

Signature

Mark R. Vatuone, Reg No. 53,719

Typed or printed name

This request must be signed in compliance with 37 CFR 1.33(b) and submitted with the application **upon filing**.

Applicant may rescind this nonpublication request at any time. If applicant rescinds a request that an application not be published under 35 U.S.C. 122(b), the application will be scheduled for publication at eighteen months from the earliest claimed filing date for which a benefit is claimed.

If applicant subsequently files an application directed to the invention disclosed in the attached application in another country, or under a multilateral international agreement, that requires publication of applications eighteen **months** after filing, the applicant must notify the United States Patent and Trademark Office of such filing within forty-five (45) days after the date of the filing of such **foreign or international application**. **Failure to do so will result in abandonment of this application (35 U.S.C. 122(b)(2)(B)(iii)).**

Burden Hour Statement: This collection of information is required by 37 CFR 1.213(a). The information is used by the public to request that an application not be published under 35 U.S.C. 122(b) (and the PTO to process that request). Confidentiality is governed by 35 U.S.C. 122 and 37 CFR 1.14. This form is estimated to take 6 minutes to complete. This time will vary depending upon the needs of the individual case. Any comments on the amount of time you are required to complete this form should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, Mail Stop Patent Application, P.O. Box 1450, Alexandria, VA 22313-1450. **DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. SEND TO: Commissioner for Patents, Mail Stop Patent Application, P.O. Box 1450, Alexandria, VA 22313-1450.**

Date of Deposit: August 31, 2006

This paper or fee is being filed on the date indicated above using the USPTO's electronic filing system EFS-Web, and is addressed to The Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450.

Electronic Acknowledgement Receipt

EFS ID:	1181548
Application Number:	11469195
Confirmation Number:	6118
Title of Invention:	SYSTEMS AND METHODS TO MODIFY PLAYOUT OR PLAYBACK
First Named Inventor:	Esteban Sardera
Customer Number:	44367
Filer:	Barbara Jean Clark/Peter Rebuffoni
Filer Authorized By:	Barbara Jean Clark
Attorney Docket Number:	2050.053US1
Receipt Date:	31-AUG-2006
Filing Date:	
Time Stamp:	17:01:15
Application Type:	Utility
International Application Number:	

Payment information:

Submitted with Payment	no
------------------------	----

File Listing:

Document Number	Document Description	File Name	File Size(Bytes)	Multi Part	Pages
1		2050_053US1_Application.pdf	5518467	yes	100

Multipart Description			
	Doc Desc	Start	End
	Transmittal letter	1	1
	Specification	2	51
	Claims	52	74
	Abstract	75	75
	Drawings	76	96
	Oath or Declaration filed	97	99
	Nonpublication request from applicant.	100	100

Warnings:

Information:

Total Files Size (in bytes):	5518467
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This Acknowledgement Receipt evidences receipt on the noted date by the USPTO of the indicated documents, characterized by the applicant, and including page counts, where applicable. It serves as evidence of receipt similar to a Post Card, as described in MPEP 503.

New Applications Under 35 U.S.C. 111

If a new application is being filed and the application includes the necessary components for a filing date (see 37 CFR 1.53(b)-(d) and MPEP 506), a Filing Receipt (37 CFR 1.54) will be issued in due course and the date shown on this Acknowledgement Receipt will establish the filing date of the application.

National Stage of an International Application under 35 U.S.C. 371

If a timely submission to enter the national stage of an international application is compliant with the conditions of 35 U.S.C. 371 and other applicable requirements a Form PCT/DO/EO/903 indicating acceptance of the application as a national stage submission under 35 U.S.C. 371 will be issued in addition to the Filing Receipt, in due course.

Under the Paperwork Reduction Act of 1995, no persons are required to respond to a collection of information unless it displays a valid OMB control number.

PATENT APPLICATION FEE DETERMINATION RECORD Substitute for Form PTO-875	Application or Docket Number 11469195
---	---

APPLICATION AS FILED – PART I			SMALL ENTITY		OR		OTHER THAN SMALL ENTITY	
(Column 1)		(Column 2)	RATE (\$)	FEE (\$)			RATE (\$)	FEE (\$)
FOR	NUMBER FILED	NUMBER EXTRA						
BASIC FEE (37 CFR 1.16(a), (b), or (c))								300
SEARCH FEE (37 CFR 1.16(k), (l), or (m))								500
EXAMINATION FEE (37 CFR 1.16(o), (p), or (q))								200
TOTAL CLAIMS (37 CFR 1.16(i))	88	minus 20 =	*	68	X\$ 25=			X\$50= 3400
INDEPENDENT CLAIMS (37 CFR 1.16(h))	28	minus 3 =	*	25	X\$100=			X\$200= 5000
APPLICATION SIZE FEE (37 CFR 1.16(s))	If the specification and drawings exceed 100 sheets of paper, the application size fee due is \$250 (\$125 for small entity) for each additional 50 sheets or fraction thereof. See 35 U.S.C. 41(a)(1)(G) and 37 CFR							
MULTIPLE DEPENDENT CLAIM PRESENT (37 CFR 1.16(j))								
			N/A				N/A	
			TOTAL				TOTAL	9400

* If the difference in column 1 is less than zero, enter "0" in column 2.

APPLICATION AS AMENDED – PART II					SMALL ENTITY		OR		OTHER THAN SMALL ENTITY		
(Column 1)		(Column 2)	(Column 3)		RATE (\$)	ADDITIONAL FEE (\$)			RATE (\$)	ADDITIONAL FEE (\$)	
AMENDMENT A	CLAIMS REMAINING AFTER AMENDMENT		HIGHEST NUMBER PREVIOUSLY PAID FOR	PRESENT EXTRA							
	Total (37 CFR 1.16(i))	*	Minus **	=	X	=			X	=	
	Independent (37 CFR 1.16(h))	*	Minus ***	=	X	=			X	=	
	Application Size Fee (37 CFR 1.16(s))					N/A				N/A	
	FIRST PRESENTATION OF MULTIPLE DEPENDENT CLAIM (37 CFR 1.16(j))					TOTAL				TOTAL	
					ADD'T FEE				ADD'T FEE		

--	--

APPLICATION AS AMENDED – PART II					SMALL ENTITY		OR		OTHER THAN SMALL ENTITY		
(Column 1)		(Column 2)	(Column 3)		RATE (\$)	ADDITIONAL FEE (\$)			RATE (\$)	ADDITIONAL FEE (\$)	
AMENDMENT B	CLAIMS REMAINING AFTER AMENDMENT		HIGHEST NUMBER PREVIOUSLY PAID FOR	PRESENT EXTRA							
	Total (37 CFR 1.16(i))	*	Minus **	=	X	=			X	=	
	Independent (37 CFR 1.16(h))	*	Minus ***	=	X	=			X	=	
	Application Size Fee (37 CFR 1.16(s))					N/A				N/A	
	FIRST PRESENTATION OF MULTIPLE DEPENDENT CLAIM (37 CFR 1.16(j))					TOTAL				TOTAL	
					ADD'T FEE				ADD'T FEE		

--	--

* If the entry in column 1 is less than the entry in column 2, write "0" in column 3.
 ** If the "Highest Number Previously Paid For" IN THIS SPACE is less than 20, enter "20".
 *** If the "Highest Number Previously Paid For" IN THIS SPACE is less than 3, enter "3".
 The "Highest Number Previously Paid For" (Total or Independent) is the highest number found in the appropriate box in column 1.

This collection of information is required by 37 CFR 1.16. The information is required to obtain or retain a benefit by the public which is to file (and by the USPTO to process) an application. Confidentiality is governed by 35 U.S.C. 122 and 37 CFR 1.14. This collection is estimated to take 12 minutes to complete, including gathering, preparing, and submitting the completed application form to the USPTO. Time will vary depending upon the individual case. Any comments on the amount of time you require to complete this form and/or suggestions for reducing this burden, should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, U.S. Department of Commerce, P.O. Box 1450, Alexandria, VA 22313-1450. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. SEND TO: Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450.

If you need assistance in completing the form, call 1-800-PTO-9199 and select option 2.


UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
 United States Patent and Trademark Office
 Address: COMMISSIONER FOR PATENTS
 P.O. Box 1450
 Alexandria, Virginia 22313-1450
 www.uspto.gov

APPLICATION NUMBER	FILING OR 371 (c) DATE	FIRST NAMED APPLICANT	ATTORNEY DOCKET NUMBER
11/469,195	08/31/2006	Esteban Sardera	2050.053US1

CONFIRMATION NO. 6118

44367
 SCHWEGMAN, LUNDBERG, WOESSNER & KLUTH/OPEN TV
 P.O. BOX 2938
 MINNEAPOLIS, MN 55402-0938

**FORMALITIES
 LETTER**

Date Mailed: 09/25/2006

NOTICE TO FILE MISSING PARTS OF NONPROVISIONAL APPLICATION
FILED UNDER 37 CFR 1.53(b)
Filing Date Granted
Items Required To Avoid Abandonment:

An application number and filing date have been accorded to this application. The item(s) indicated below, however, are missing. Applicant is given **TWO MONTHS** from the date of this Notice within which to file all required items and pay any fees required below to avoid abandonment. Extensions of time may be obtained by filing a petition accompanied by the extension fee under the provisions of 37 CFR 1.136(a).

- The statutory basic filing fee is missing.
Applicant must submit \$ 300 to complete the basic filing fee for a non-small entity. If appropriate, applicant may make a written assertion of entitlement to small entity status and pay the small entity filing fee (37 CFR 1.27).
- The oath or declaration is unsigned.

The applicant needs to satisfy supplemental fees problems indicated below.

The required item(s) identified below must be timely submitted to avoid abandonment:

- Additional claim fees of **\$8400** as a non-small entity, including any required multiple dependent claim fee, are required. Applicant must submit the additional claim fees or cancel the additional claims for which fees are due.
- To avoid abandonment, a surcharge (for late submission of filing fee, search fee, examination fee or oath or declaration) as set forth in 37 CFR 1.16(f) of \$130 for a non-small entity, must be submitted with the missing items identified in this letter.

SUMMARY OF FEES DUE:

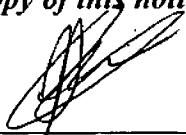
Total additional fee(s) required for this application is **\$9530** for a non-small entity

- **\$300** Statutory basic filing fee.
- **\$130** Surcharge.
- The application search fee has not been paid. Applicant must submit **\$500** to complete the search fee.

- The application examination fee has not been paid. Applicant must submit **\$200** to complete the examination fee for a non-small entity.
- Total additional claim fee(s) for this application is **\$8400**
 - **\$5000** for **25** independent claims over 3.
 - **\$3400** for **68** total claims over 20.

Replies should be mailed to: Mail Stop Missing Parts
Commissioner for Patents
P.O. Box 1450
Alexandria VA 22313-1450

*A copy of this notice **MUST** be returned with the reply.*



Office of Initial Patent Examination (571) 272-4000, or 1-800-PTO-9199, or 1-800-972-6382
PART 3 - OFFICE COPY



UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
 United States Patent and Trademark Office
 Address: COMMISSIONER FOR PATENTS
 P.O. Box 1450
 Alexandria, Virginia 22313-1450
 www.uspto.gov

APPLICATION NUMBER	FILING OR 371 (c) DATE	FIRST NAMED APPLICANT	ATTORNEY DOCKET NUMBER
11/469,195	08/31/2006	Esteban Sarder	2050.053US1

44367
 SCHWEGMAN, LUNDBERG, WOESSNER & KLUTH/OPEN TV
 P.O. BOX 2938
 MINNEAPOLIS, MN 55402-0938



CONFIRMATION NO. 6118
 FORMALITIES
 LETTER

Date Mailed: 09/25/2006

NOTICE TO FILE MISSING PARTS OF NONPROVISIONAL APPLICATION

12/12/2006 BABRAHA1 00000006 11469195

FILED UNDER 37 CFR 1.53(b)

01 FC:1011	300.00 OP
02 FC:1111	500.00 OP
03 FC:1311	200.00 OP
04 FC:1202	3400.00 OP
05 FC:1201	5000.00 OP
06 FC:1051	

Filing Date Granted

Items Required To Avoid Abandonment:

An application number and filing date have been accorded to this application. The item(s) indicated below, however, are missing. Applicant is given **TWO MONTHS** from the date of this Notice within which to file all required items and pay any fees required below to avoid abandonment. Extensions of time may be obtained by filing a petition accompanied by the extension fee under the provisions of 37 CFR 1.136(a).

- The statutory basic filing fee is missing.
Applicant must submit \$ 300 to complete the basic filing fee for a non-small entity. If appropriate, applicant may make a written assertion of entitlement to small entity status and pay the small entity filing fee (37 CFR 1.27).
- The oath or declaration is unsigned.

The applicant needs to satisfy supplemental fees problems indicated below.

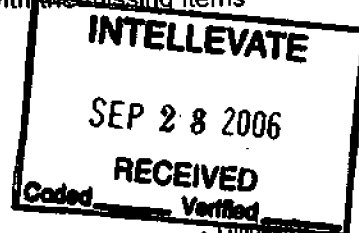
The required item(s) identified below must be timely submitted to avoid abandonment:

- Additional claim fees of \$8400 as a non-small entity, including any required multiple dependent claim fee, are required. Applicant must submit the additional claim fees or cancel the additional claims for which fees are due.
- To avoid abandonment, a surcharge (for late submission of filing fee, search fee, examination fee or oath or declaration) as set forth in 37 CFR 1.16(f) of \$130 for a non-small entity, must be submitted with the missing items identified in this letter.

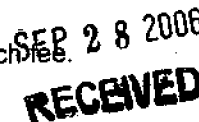
SUMMARY OF FEES DUE:

Total additional fee(s) required for this application is \$9530 for a non-small entity

- \$300 Statutory basic filing fee.
- \$130 Surcharge.
- The application search fee has not been paid. Applicant must submit \$500 to complete the search fee.



Schwegman, Lundberg, Woessner & Kluth, P.A.



- The application examination fee has not been paid. Applicant must submit \$200 to complete the examination fee for a non-small entity.

- Total additional claim fee(s) for this application is \$8400
 - \$5000 for 25 independent claims over 3.
 - \$3400 for 68 total claims over 20.

Replies should be mailed to: Mail Stop Missing Parts
Commissioner for Patents
P.O. Box 1450
Alexandria VA 22313-1450

*A copy of this notice **MUST** be returned with the reply.*

Office of Initial Patent Examination (571) 272-4000, or 1-800-PTO-9199, or 1-800-972-6382
PART 2 - COPY TO BE RETURNED WITH RESPONSE



IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Applicant: Esteban Sardera

Title: SYSTEMS AND METHODS TO MODIFY PLAYOUT OR PLAYBACK

Docket No.: 2050.053US1

Serial No.: 11/469,195

Filed: August 31, 2006

Due Date: November 25, 2006

Examiner: Unknown

Group Art Unit: 3763

Mail Stop Missing Parts
Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

We are transmitting herewith the attached:

- A return postcard.
- A check in the amount of \$130.00 to cover the large entity surcharge.
- A check in the amount of \$9400.00 to cover the Basic Filing Fee and Additional Claims Fee.
- A check in the amount of \$120.00 to cover the Extension of Time Fee.
- Petition for Extension of Time (1 pg.).
- Communication Re: Missing Parts (1 pg.).
- A signed Combined Declaration and Power of Attorney (3 pgs.).
- Notice to File Missing Parts (2 pgs.).

If not provided for in a separate paper filed herewith, please consider this a PETITION FOR EXTENSION OF TIME for sufficient number of months to enter these papers and please charge any additional required fees or credit overpayment to Deposit Account No. 19-0743.

SCHWEGMAN, LUNDBERG, WOESSNER & KLUTH, P.A.

Customer Number: 21186

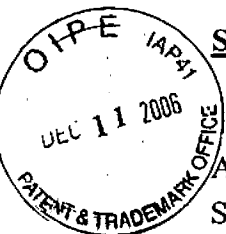
By:

Name: Mark R. Vatuone
Reg. No. 53,719

CERTIFICATE UNDER 37 CFR 1.8: The undersigned hereby certifies that this correspondence is being deposited with the United States Postal Service with sufficient postage as first class mail, in an envelope addressed to: Attn: Mail Stop Missing Parts, Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450, on this 6 day of December, 2006.

Lynnea M. Fedya
Name

Signature



S/N 11/469,195

PATENT

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Applicant:	Esteban Sardera	Examiner:	Unknown
Serial No.:	11/469,195	Group Art Unit:	3763
Filed:	August 31, 2006	Docket:	2050.053US1
Customer No.:	21186	Confirmation No.:	6118
Title:	SYSTEMS AND METHODS TO MODIFY PLAYOUT OR PLAYBACK		

COMMUNICATION RE: MISSING PARTS

Mail Stop Missing Parts
Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

In response to the "Notice to File Missing Parts" (see enclosed copy), we submit the Combined Declaration and Power of Attorney, a check in the amount of \$130.00 to cover the Large entity surcharge, and a check in the amount of \$9400.00 to cover the large entity basic filing fee and additional claims fee.

Applicant assumes the application is now in proper order and in condition for examination. Please direct any inquiries to the undersigned attorney at 408-278-4046.

If necessary, please charge any additional fees or credit overpayment to Deposit Account 19-0743.

Respectfully submitted,
Esteban Sardera

By his Representatives,
SCHWEGMAN, LUNDBERG, WOESSNER & KLUTH, P.A.
P.O. Box 2938
Minneapolis, MN 55402
408-278-4046

Date December 6, 2006

By Mark R. Vatuone

Mark R. Vatuone
Reg. No. 53,719

CERTIFICATE UNDER 37 CFR 1.8: The undersigned hereby certifies that this correspondence is being deposited with the United States Postal Service with sufficient postage as first class mail, in an envelope addressed to: Attn: Mail Stop Missing Parts, Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450, on this 6 day of December, 2006

Lynnea M. Fedge
Name

[Signature]
Signature



SCHWEGMAN ■ LUNDBERG ■ WOESSNER ■ KLUTH

United States Patent Application
COMBINED DECLARATION AND POWER OF ATTORNEY

As a below named inventor I hereby declare that: my residence, post office address and citizenship are as stated below next to my name; that

I verily believe I am the original, sole inventor of the subject matter which is claimed and for which a patent is sought on the invention entitled: **SYSTEMS AND METHODS TO MODIFY PLAYOUT OR PLAYBACK**,

the specification of which was filed on August 31, 2006 as application serial no. 11/469,195.

I hereby state that I have reviewed and understand the contents of the above-identified specification, including the claims, as amended by any amendment referred to above.

I acknowledge the duty to disclose information which is material to the patent ability of this application in accordance with 37 C.F.R. § 1.56 (attached hereto). I also acknowledge my duty to disclose all information known to be material to patent ability which became available between a filing date of a prior application and the national or PCT international filing date in the event this is a Continuation-In-Part application in accordance with 37 C.F.R. § 1.63(e).

I hereby claim foreign priority benefits under 35 U.S.C. §119(a)-(d) or 365(b) of any foreign application(s) for patent or inventor's certificate, or 365(a) of any PCT international application which designated at least one country other than the United States of America, listed below and have also identified below any foreign application for patent or inventor's certificate having a filing date before that of the application on the basis of which priority is claimed:

No such claim for priority is being made at this time.

I hereby claim the benefit under 35 U.S.C. § 119(e) of any United States provisional application(s) listed below:

No such claim for priority is being made at this time.

I hereby claim the benefit under 35 U.S.C. § 120 or 365(c) of any United States and PCT international application(s) listed below and, insofar as the subject matter of each of the claims of this application is not disclosed in the prior United States or PCT international application in the manner provided by the first paragraph of 35 U.S.C. § 112, I acknowledge the duty to disclose material information as defined in 37 C.F.R. § 1.56(a) which became available between the filing date of the prior application and the national or PCT international filing date of this application:

No such claim for priority is being made at this time.

I hereby appoint the attorneys associated with the customer number listed below to prosecute this application and to transact all business in the Patent and Trademark Office connected herewith:

Customer Number: ~~21186~~ 44367 12.1.2006 *MAV*.

I hereby authorize them to act and rely on instructions from and communicate directly with the person/assignee/attorney/firm/organization/who/which first sends/sent this case to them and by whom/which I hereby declare that I have consented after full disclosure to be represented unless/until I instruct Schwegman, Lundberg, Woessner & Kluth, P.A. to the contrary.

Please direct all correspondence in this case to Schwegman, Lundberg, Woessner & Kluth, P.A. at the address indicated below:

Customer Number. ~~21186~~ 44367 12.1.2006 *MAV*

I hereby declare that all statements made herein of my own knowledge are true and that all statements made on information and belief are believed to be true; and further that these statements were made with the knowledge that willful false statements and the like so made are punishable by fine or imprisonment, or both, under Section 1001 of Title 18 of the United States Code and that such willful false statements may jeopardize the validity of the application or any patent issued thereon.

Full Name of sole inventor : Esteban Sarderá
Citizenship: United States of America Residence: San Francisco, CA
Post Office Address: 3700 Divisadero Street, #303
San Francisco, CA 94123

Signature: _____

Esteban Sarderá
Esteban Sarderá

Date: _____

11/13/06

§ 1.56 Duty to disclose information material to patentability.

(a) A patent by its very nature is affected with a public interest. The public interest is best served, and the most effective patent examination occurs when, at the time an application is being examined, the Office is aware of and evaluates the teachings of all information material to patentability. Each individual associated with the filing and prosecution of a patent application has a duty of candor and good faith in dealing with the Office, which includes a duty to disclose to the Office all information known to that individual to be material to patentability as defined in this section. The duty to disclose information exists with respect to each pending claim until the claim is canceled or withdrawn from consideration, or the application becomes abandoned. Information material to the patentability of a claim that is canceled or withdrawn from consideration need not be submitted if the information is not material to the patentability of any claim remaining under consideration in the application. There is no duty to submit information which is not material to the patentability of any existing claim. The duty to disclose all information known to be material to patentability is deemed to be satisfied if all information known to be material to patentability of any claim issued in a patent was cited by the Office or submitted to the Office in the manner prescribed by §§ 1.97(b)-(d) and 1.98. However, no patent will be granted on an application in connection with which fraud on the Office was practiced or attempted or the duty of disclosure was violated through bad faith or intentional misconduct. The Office encourages applicants to carefully examine:

- (1) prior art cited in search reports of a foreign patent office in a counterpart application, and
- (2) the closest information over which individuals associated with the filing or prosecution of a patent application believe any pending claim patentably defines, to make sure that any material information contained therein is disclosed to the Office.

(b) Under this section, information is material to patentability when it is not cumulative to information already of record or being made of record in the application, and

- (1) It establishes, by itself or in combination with other information, a prima facie case of unpatentability of a claim; or
- (2) It refutes, or is inconsistent with, a position the applicant takes in:
 - (i) Opposing an argument of unpatentability relied on by the Office, or
 - (ii) Asserting an argument of patentability.

A prima facie case of unpatentability is established when the information compels a conclusion that a claim is unpatentable under the preponderance of evidence, burden-of-proof standard, giving each term in the claim its broadest reasonable construction consistent with the specification, and before any consideration is given to evidence which may be submitted in an attempt to establish a contrary conclusion of patentability.

(c) Individuals associated with the filing or prosecution of a patent application within the meaning of this section are:

- (1) Each inventor named in the application;
- (2) Each attorney or agent who prepares or prosecutes the application; and
- (3) Every other person who is substantively involved in the preparation or prosecution of the application and who is associated with the inventor, with the assignee or with anyone to whom there is an obligation to assign the application.

(d) Individuals other than the attorney, agent or inventor may comply with this section by disclosing information to the attorney, agent, or inventor.



S/N 11/469,195

PATENT

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Applicant:	Esteban Sardera	Examiner:	Unknown
Serial No.:	11/469,195	Group Art Unit:	3763
Filed:	August 31, 2006	Docket No:	2050.053US1
Title	SYSTEMS AND METHODS TO MODIFY PLAYOUT OR PLAYBACK		

PETITION FOR A ONE-MONTH EXTENSION OF TIME

Mail Stop: Missing Parts
Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

In accordance with the provision of 37 CFR § 1.136(a), it is respectfully requested that a one-month extension of time be granted in which to respond to the Missing Parts mailed December 4, 2006, said period of response being extended from November 25, 2006 to December 25, 2006.

Our check in the amount of \$120.00 is enclosed to cover the required extension fee. Please charge any additional fees or credit overpayment to deposit Account No. 19-0743.

Respectfully Submitted

ESTEBAN SARDERA


By his Representatives,

SCHWEGMAN, LUNDBERG, WOESSNER & KLUTH, P.A
P.O. Box 2938
Minneapolis, MN 55402
408-278-4046

12/12/2006 BABRAHA1 00000006 11469195

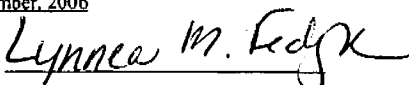
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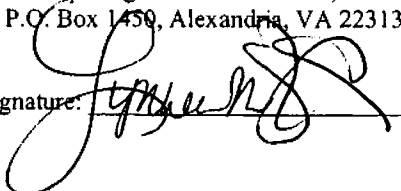
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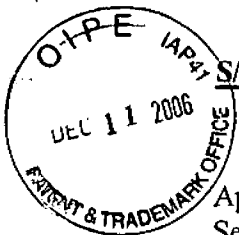
Date: December 6, 2006 By: 

Mark R. Vatuone
Reg. No: 53,719

CERTIFICATE UNDER 37 CFR § 1.8: The undersigned hereby certifies that this correspondence is being deposited with the United States Postal Service with sufficient postage as first class mail, in an envelope addressed to: Mail Stop: Missing Parts, Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450, on this 6 day of December, 2006

Name: 

Signature: 



S/N 11/469,195

PATENT

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Applicant:	Esteban Sardera	Examiner:	Unknown
Serial No.:	11/469,195	Group Art Unit:	3763
Filed:	August 31, 2006	Docket No:	2050.053US1
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Mail Stop: Missing Parts
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P.O. Box 1450
Alexandria, VA 22313-1450

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Respectfully Submitted

ESTEBAN SARDERA

By his Representatives,

SCHWEGMAN, LUNDBERG, WOESSNER & KLUTH, P.A
P.O. Box 2938
Minneapolis, MN 55402
408-278-4046

12/12/2006 BABRAHA1 00000006 11469195

07 FC:1251

120.00 OP

Date: December 6, 2006 By: _____

Mark R. Vatuone
Reg. No: 53,719

CERTIFICATE UNDER 37 CFR § 1.8: The undersigned hereby certifies that this correspondence is being deposited with the United States Postal Service with sufficient postage as first class mail, in an envelope addressed to: Mail Stop: Missing Parts, Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450, on this 6 day of December, 2006

Name: _____

Signature: _____



UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

Table with 8 columns: APPLICATION NUMBER, FILING or 371(c) DATE, GRP ART UNIT, FIL FEE REC'D, ATTY.DOCKET.NO, DRAWINGS, TOT CLAIMS, IND CLAIMS. Row 1: 11/469,195, 08/31/2006, 3763, 9530, 2050.053US1, 21, 88, 28

CONFIRMATION NO. 6118

44367
SCHWEGMAN, LUNDBERG, WOESSNER & KLUTH/OPEN TV
P.O. BOX 2938
MINNEAPOLIS, MN55402-0938

UPDATED FILING RECEIPT

Date Mailed: 12/19/2006

Receipt is acknowledged of this regular Patent Application. It will be considered in its order and you will be notified as to the results of the examination. Be sure to provide the U.S. APPLICATION NUMBER, FILING DATE, NAME OF APPLICANT, and TITLE OF INVENTION when inquiring about this application. Fees transmitted by check or draft are subject to collection. Please verify the accuracy of the data presented on this receipt. If an error is noted on this Filing Receipt, please mail to the Commissioner for Patents P.O. Box 1450 Alexandria Va 22313-1450. Please provide a copy of this Filing Receipt with the changes noted thereon. If you received a "Notice to File Missing Parts" for this application, please submit any corrections to this Filing Receipt with your reply to the Notice. When the USPTO processes the reply to the Notice, the USPTO will generate another Filing Receipt incorporating the requested corrections (if appropriate).

Applicant(s)
Esteban Sardera, San Francisco, CA;

Power of Attorney: The patent practitioners associated with Customer Number 44367

Domestic Priority data as claimed by applicant

Foreign Applications

If Required, Foreign Filing License Granted: 09/22/2006

The country code and number of your priority application, to be used for filing abroad under the Paris Convention, is US11/469,195

Projected Publication Date: Request for Non-Publication Acknowledged

Non-Publication Request: Yes

Early Publication Request: No

Title

SYSTEMS AND METHODS TO MODIFY PLAYOUT OR PLAYBACK

Preliminary Class

604

PROTECTING YOUR INVENTION OUTSIDE THE UNITED STATES

Since the rights granted by a U.S. patent extend only throughout the territory of the United States and have no effect in a foreign country, an inventor who wishes patent protection in another country must apply for a patent in a specific country or in regional patent offices. Applicants may wish to consider the filing of an international application under the Patent Cooperation Treaty (PCT). An international (PCT) application generally has the same effect as a regular national patent application in each PCT-member country. The PCT process **simplifies** the filing of patent applications on the same invention in member countries, but **does not result** in a grant of "an international patent" and does not eliminate the need of applicants to file additional documents and fees in countries where patent protection is desired.

Almost every country has its own patent law, and a person desiring a patent in a particular country must make an application for patent in that country in accordance with its particular laws. Since the laws of many countries differ in various respects from the patent law of the United States, applicants are advised to seek guidance from specific foreign countries to ensure that patent rights are not lost prematurely.

Applicants also are advised that in the case of inventions made in the United States, the Director of the USPTO must issue a license before applicants can apply for a patent in a foreign country. The filing of a U.S. patent application serves as a request for a foreign filing license. The application's filing receipt contains further information and guidance as to the status of applicant's license for foreign filing.

Applicants may wish to consult the USPTO booklet, "General Information Concerning Patents" (specifically, the section entitled "Treaties and Foreign Patents") for more information on timeframes and deadlines for filing foreign patent applications. The guide is available either by contacting the USPTO Contact Center at 800-786-9199, or it can be viewed on the USPTO website at <http://www.uspto.gov/web/offices/pac/doc/general/index.html>.

For information on preventing theft of your intellectual property (patents, trademarks and copyrights), you may wish to consult the U.S. Government website, <http://www.stopfakes.gov>. Part of a Department of Commerce initiative, this website includes self-help "toolkits" giving innovators guidance on how to protect intellectual property in specific countries such as China, Korea and Mexico. For questions regarding patent enforcement issues, applicants may call the U.S. Government hotline at 1-866-999-HALT (1-866-999-4158).

LICENSE FOR FOREIGN FILING UNDER

Title 35, United States Code, Section 184

Title 37, Code of Federal Regulations, 5.11 & 5.15

GRANTED

The applicant has been granted a license under 35 U.S.C. 184, if the phrase "IF REQUIRED, FOREIGN FILING LICENSE GRANTED" followed by a date appears on this form. Such licenses are issued in all applications where the conditions for issuance of a license have been met, regardless of whether or not a license may be required as set forth in 37 CFR 5.15. The scope and limitations of this license are set forth in 37 CFR 5.15(a) unless an earlier license has been issued under 37 CFR 5.15(b). The license is subject to revocation upon written notification. The date indicated is the effective date of the license, unless an earlier license of similar scope has been granted under 37 CFR 5.13 or 5.14.

This license is to be retained by the licensee and may be used at any time on or after the effective date thereof unless it is revoked. This license is automatically transferred to any related applications(s) filed under 37 CFR 1.53(d). This license is not retroactive.

The grant of a license does not in any way lessen the responsibility of a licensee for the security of the subject matter as imposed by any Government contract or the provisions of existing laws relating to espionage and the national security or the export of technical data. Licensees should apprise themselves of current regulations especially with respect to certain countries, of other agencies, particularly the Office of Defense Trade Controls, Department of State (with respect to Arms, Munitions and Implements of War (22 CFR 121-128)); the Bureau of Industry and Security, Department of Commerce (15 CFR parts 730-774); the

Office of Foreign Assets Control, Department of Treasury (31 CFR Parts 500+) and the Department of Energy.

NOT GRANTED

No license under 35 U.S.C. 184 has been granted at this time, if the phrase "IF REQUIRED, FOREIGN FILING LICENSE GRANTED" DOES NOT appear on this form. Applicant may still petition for a license under 37 CFR 5.12, if a license is desired before the expiration of 6 months from the filing date of the application. If 6 months has lapsed from the filing date of this application and the licensee has not received any indication of a secrecy order under 35 U.S.C. 181, the licensee may foreign file the application pursuant to 37 CFR 5.15(b).

RESCISSION OF PREVIOUS NONPUBLICATION REQUEST (35 U.S.C. 122(b)(2)(B)(ii)) AND, IF APPLICABLE, NOTICE OF FOREIGN FILING (35 U.S.C. 122(b)(2)(B)(iii)) Send completed form to: Mail Stop PG Pub Commissioner for Patents P.O. Box 1450 Alexandria, VA 22313-1450 FAX: (571) 273-8300	Application Number		11/469,195
	Filing Date		August 31, 2006
	First Named Inventor		Esteban Sardera
	Title	SYSTEMS AND METHODS TO MODIFY PLAYOUT OR PLAYBACK	
	Atty Docket Number		2050.053US1
	Group Art Unit		3763
	Examiner		Unknown

A request that the above-identified application not be published under 35 U.S.C. 122(b) (nonpublication request) was included with the above-identified application on filing pursuant to 35 U.S.C. 122(b)(2)(B)(i). I hereby rescind the previous nonpublication request.

If a notice of foreign or international filing is or will be required by 35 U.S.C. 122(b)(2)(B)(iii) and 37 CFR 1.213(c), I hereby provide such notice. This notice is being provided no later than forty-five (45) days after the date of such foreign or international filing.

If a notice of subsequent foreign or international filing required by 35 U.S.C. 122(b)(2)(B)(iii) and 37 CFR 1.213(c) was not filed within forty-five (45) days after the date of filing of the foreign or international application, the application is ABANDONED, and a petition to revive under 37 CFR 1.137(b) is required. See 37 CFR 1.137 (f).

Mark R. Vatuone
Signature

August 22, 2007
Date

Mark R. Vatuone
Typed or printed name

53,719
Registration Number,
if applicable

408-278-4046
Telephone Number

This request must be signed in compliance with 37 CFR 1.33(b).

If information or assistance is needed in completing this form, please contact the Pre-Grant Publication Division at (703) 605-4283 or by e-mail at PGPub@USPTO.gov.

CERTIFICATE OF MAILING OR TRANSMISSION

I hereby certify that this correspondence is being filed using the USPTO's electronic filing system EFS-Web, and is addressed to: Mail Stop PG PUB, Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450, on this 22 day of August, 2007.

NICOLE JACK
Name
[Signature]
Signature

August 22, 2007
Date

Electronic Acknowledgement Receipt

EFS ID:	2113058
Application Number:	11469195
International Application Number:	
Confirmation Number:	6118
Title of Invention:	SYSTEMS AND METHODS TO MODIFY PLAYOUT OR PLAYBACK
First Named Inventor/Applicant Name:	Esteban Sardera
Customer Number:	44367
Filer:	Richard E. Billion./Nicole Jack
Filer Authorized By:	Richard E. Billion.
Attorney Docket Number:	2050.053US1
Receipt Date:	22-AUG-2007
Filing Date:	31-AUG-2006
Time Stamp:	16:46:20
Application Type:	Utility under 35 USC 111(a)

Payment information:

Submitted with Payment	no
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File Listing:

Document Number	Document Description	File Name	File Size(Bytes) /Message Digest	Multi Part /.zip	Pages (if appl.)
1		2050053us1rescission.pdf	110719 <small>3425d286f3c2f22eb630bf50e4457a4e8316b262</small>	yes	2

Multipart Description/PDF files in .zip description			
Document Description		Start	End
Miscellaneous Incoming Letter		1	1
Rescind Nonpublication Request for Pre Grant Pub		2	2

Warnings:

Information:

Total Files Size (in bytes):	110719
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This Acknowledgement Receipt evidences receipt on the noted date by the USPTO of the indicated documents, characterized by the applicant, and including page counts, where applicable. It serves as evidence of receipt similar to a Post Card, as described in MPEP 503.

New Applications Under 35 U.S.C. 111

If a new application is being filed and the application includes the necessary components for a filing date (see 37 CFR 1.53(b)-(d) and MPEP 506), a Filing Receipt (37 CFR 1.54) will be issued in due course and the date shown on this Acknowledgement Receipt will establish the filing date of the application.

National Stage of an International Application under 35 U.S.C. 371

If a timely submission to enter the national stage of an international application is compliant with the conditions of 35 U.S.C. 371 and other applicable requirements a Form PCT/DO/EO/903 indicating acceptance of the application as a national stage submission under 35 U.S.C. 371 will be issued in addition to the Filing Receipt, in due course.

New International Application Filed with the USPTO as a Receiving Office

If a new international application is being filed and the international application includes the necessary components for an international filing date (see PCT Article 11 and MPEP 1810), a Notification of the International Application Number and of the International Filing Date (Form PCT/RO/105) will be issued in due course, subject to prescriptions concerning national security, and the date shown on this Acknowledgement Receipt will establish the international filing date of the application.

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Applicant: Esteban Sardera

Title: SYSTEMS AND METHODS TO MODIFY PAYOUT OR PLAYBACK

Docket No.: 2050.053US1

Serial No.: 11/469,195

Filed: August 31, 2006

Examiner: Unknown

Group Art Unit: 3763

Mail Stop PG PUB

Commissioner for Patents

P.O. Box 1450

Alexandria, VA 22313-1450

We are transmitting herewith the following attached items (as indicated with an "X"):

Rescission of Previous Non-Publication Request (1 pg.).

Please charge any additional fees or credit overpayment to Deposit Account No. 19-0743.

SCHWEGMAN, LUNDBERG & WOESSNER, P.A.

Customer Number 44367

By: 


Atty: Mark R. Vatuone

Reg. No. 53,719

CERTIFICATE UNDER 37 CFR 1.8: The undersigned hereby certifies that this correspondence is being filed using the USPTO's electronic filing system EFS-Web, and is addressed to: Mail Stop PG PUB, Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450, on this 22 day of August, 2007.

Niame Jack

Name


Signature

SCHWEGMAN, LUNDBERG & WOESSNER, P.A.

(GENERAL)


UNITED STATES PATENT AND TRADEMARK OFFICE

 UNITED STATES DEPARTMENT OF COMMERCE
 United States Patent and Trademark Office
 Address: COMMISSIONER FOR PATENTS
 P.O. Box 1450
 Alexandria, Virginia 22313-1450
 www.uspto.gov

APPLICATION NUMBER	FILING/RECEIPT DATE	FIRST NAMED APPLICANT	ATTY. DOCKET NO.
11/469,195	08/31/2006	Esteban Sardera	2050.053US1

CONFIRMATION NO. 6118

44367

 SCHWEGMAN, LUNDBERG & WOESSNER/OPEN TV
 P.O. BOX 2938
 MINNEAPOLIS, MN 55402-0938

Date Mailed: 08/24/2007

Communication Regarding Rescission Of Nonpublication Request and/or Notice of Foreign Filing

Applicant's rescission of the previously-filed nonpublication request and/or notice of foreign filing is acknowledged. The paper has been reflected in the Patent and Trademark Office's (USPTO's) computer records so that the earliest possible projected publication date can be assigned.

The projected publication date is 03/06/2008.

If applicant rescinded the nonpublication request before or on the date of "foreign filing,"¹ then no notice of foreign filing is required.

If applicant foreign filed the application after filing the above application and before filing the rescission, and the rescission did not also include a notice of foreign filing, then a notice of foreign filing (not merely a rescission) is required to be filed within 45 days of the date of foreign filing. See 35 U.S.C. § 122(b)(2)(B)(iii), and Clarification of the United States Patent and Trademark Office's Interpretation of the Provisions of 35 U.S.C. § 122(b)(2)(B)(ii)-(iv), 1272 Off. Gaz. Pat. Office 22 (July 1, 2003).

If a notice of foreign filing is required and is not filed within 45 days of the date of foreign filing, then the application becomes abandoned pursuant to 35 U.S.C. § 122(b)(2)(B)(iii). In this situation, applicant should either file a petition to revive or notify the Office that the application is abandoned. See 37 CFR 1.137(f). Any such petition to revive will be forwarded to the Office of Petitions for a decision. Note that the filing of the petition will not operate to stay any period of reply that may be running against the application.

Questions regarding petitions to revive should be directed to the Office of Petitions at (571) 272-3282. Questions regarding publications of patent applications should be directed to the patent application publication hotline at (703) 605-4283 or by e-mail pgpub@uspto.gov.

¹ Note, for purpose of this notice, that "foreign filing" means "filing an application directed to the same invention in another country, or under a multilateral international agreement, that requires publication of applications 18 months after filing".



APPLICATION NUMBER	FILING OR 371(c) DATE	FIRST NAMED APPLICANT	ATTY. DOCKET NO./TITLE
11/469,195	08/31/2006	Esteban Sardera	2050.053US1

CONFIRMATION NO. 6118

44367
SCHWEGMAN, LUNDBERG & WOESSNER/OPEN TV
P.O. BOX 2938
MINNEAPOLIS, MN55402-0938

Date Mailed: 08/30/2007

NOTICE OF NEW OR REVISED PROJECTED PUBLICATION DATE

The above-identified application has a new or revised projected publication date. The current projected publication date for this application is 03/06/2008. If this is a new projected publication date (there was no previous projected publication date), the application has been cleared by Licensing & Review or a secrecy order has been rescinded and the application is now in the publication queue.

If this is a revised projected publication date (one that is different from a previously communicated projected publication date), the publication date has been revised due to processing delays in the USPTO or the abandonment and subsequent revival of an application. The application is anticipated to be published on a date that is more than six weeks different from the originally-projected publication date.

More detailed publication information is available through the private side of Patent Application Information Retrieval (PAIR) System. The direct link to access PAIR is currently <http://pair.uspto.gov>. Further assistance in electronically accessing the publication, or about PAIR, is available by calling the Patent Electronic Business Center at 1-866-217-9197.

Questions relating to this Notice should be directed to the Office of Patent Publication at 1-888-786-0101.

PART 1 - ATTORNEY/APPLICANT COPY



APPLICATION NUMBER	FILING OR 371(c) DATE	FIRST NAMED APPLICANT	ATTY. DOCKET NO./TITLE
11/469,195	08/31/2006	Esteban Sardera	2050.053US1

CONFIRMATION NO. 6118

44367
SCHWEGMAN, LUNDBERG & WOESSNER/OPEN TV
P.O. BOX 2938
MINNEAPOLIS, MN55402-0938

Date Mailed: 03/13/2008

NOTICE OF NEW OR REVISED PROJECTED PUBLICATION DATE

The above-identified application has a new or revised projected publication date. The current projected publication date for this application is 05/29/2008. If this is a new projected publication date (there was no previous projected publication date), the application has been cleared by Licensing & Review or a secrecy order has been rescinded and the application is now in the publication queue.

If this is a revised projected publication date (one that is different from a previously communicated projected publication date), the publication date has been revised due to processing delays in the USPTO or the abandonment and subsequent revival of an application. The application is anticipated to be published on a date that is more than six weeks different from the originally-projected publication date.

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Questions relating to this Notice should be directed to the Office of Patent Publication at 1-888-786-0101.

PART 1 - ATTORNEY/APPLICANT COPY



APPLICATION NUMBER	FILING OR 371(c) DATE	FIRST NAMED APPLICANT	ATTY. DOCKET NO./TITLE
11/469,195	08/31/2006	Esteban Sardera	2050.053US1

CONFIRMATION NO. 6118

44367

SCHWEGMAN, LUNDBERG & WOESSNER/OPEN TV
P.O. BOX 2938
MINNEAPOLIS, MN55402-0938**Title:** SYSTEMS AND METHODS TO MODIFY PLAYOUT OR PLAYBACK**Publication No.** US-2008-0124052-A1**Publication Date:** 05/29/2008

NOTICE OF PUBLICATION OF APPLICATION

The above-identified application will be electronically published as a patent application publication pursuant to 37 CFR 1.211, et seq. The patent application publication number and publication date are set forth above.

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Examiner Initial *	USP Document Number	Publication Date	Name of Patentee or Applicant of cited Document	Filing Date If Appropriate
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	EP-1553598A2	07/13/2005	Hirabayashi, M., et al.	
	WO-2005029836A2	03/31/2005	DELPUCH, A., et al.	

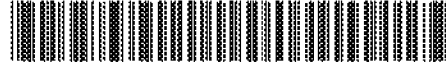
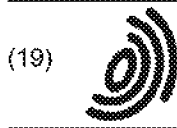
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	"European Application Serial No. 07115246.6 office action mailed 10/27/2009", 3 pgs	
	"FX to test new ad to combat DVR viewers", [Online]. Retrieved from the Internet: <URL: http://news.com.com/FX+to+test+new+ad+to+combat+DVR+viewers/2100-1024_3-6116143.html?tag=nefd.top >, (Sept. 15, 2006)	

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(54) **Optical disk and optical disk reproduction apparatus**

(57) An optical disk comprising compressed moving
picture data and an optical disk reproduction apparatus
each capable of easily effecting trick play such as high
speed reproduction and a retrieval operation at a high
speed. Additional information necessary for trick play is
recorded in an arbitrary area of an optical disk such as

a TOC (Table of Contents) or a leading sector (sector 0)
of the disk, and a sector address is added to each sector.
To conduct trick play, an I picture, a P picture and a B
picture contained in a GOP layer inside a bit stream of
compressed image data are extracted and reproduced
in accordance with a reproduction speed by looking up
a trick play table.

FIG. 1

INDEX NO.	SECTOR ADDRESS
1	00000
2	0001F
3	00027
4	0004B
.	.
.	.
.	.

Description

and reproducing the data has been announced already.

BACKGROUND OF THE INVENTION**SUMMARY OF THE INVENTION**

[0001] This invention relates to an optical disk recording thereon compressed data of an image, and to an optical disk reproduction apparatus for reproducing the image data from the optical disk.

[0002] A so-called "CD-ROM" is a typical example of those systems which reproduce digital data by using an optical disk. The CD-ROM records data for a computer on an optical disk having the same physical format as CDs for audio use, and has the data format to be next described. A data string recorded on the optical disk comprises the smallest unit referred to as a "frame", and each frame contains digital data such as sync data, sub-code, main information and an error correction code.

[0003] Further, the CD-ROM employs the sector structure in which 98 frames (2,352 bytes) are gathered into 1 sector, and each sector comprises a 12-byte sync data, a 4-byte header data representing an address and a mode, a 2,048-byte digital data and a 288-byte error detection/correction code.

[0004] On the other hand, a system comprising the combination of an inter-frame prediction with orthogonal transform, quantization and variable-length encoding is well known as an encoding system of moving picture, and an MPEG system of the ISO (International Organization of Standardization) is also based on this system. In the case of MPEG2, for example, the bit stream of the encoded image data is divided into six hierarchical layers, i.e. a sequence layer, a GOP (Group of Pictures) layer, a picture layer, a slice layer, a macro-block layer and a block layer. Among them, the GOP layer contains three kinds of data, that is, an I picture encoded from the information alone without using inter-frame prediction, a P picture generated by executing prediction from the I picture or P picture and a B picture generated by bidirectional prediction. The sequence layer comprises a GOP containing image data starting from the I picture and obtained by gathering the I picture, the P picture and B picture into one group, and an SH (Sequence Header) added to the leading part of the GOP.

[0005] When moving picture are converted to compressed image data by high efficiency encoding, there is known a system which encodes the signal by reducing a compression ratio for scenes having vigorous motion, or in other words, at a high transfer rate, and by increasing the compression ratio for scenes having small motion, or in other words, at a low transfer rate. The variable transfer rate compressed image data so encoded can reduce image deterioration due to compression in comparison with compressed image data of a fixed transfer rate obtained by fixing the compression ratio at a mean value.

[0006] An apparatus for recording the compressed image data having the variable transfer rate or the fixed transfer rate into the optical disk such as the CD-ROM

[0007] The prior art technology described above does not particularly consider so-called "trick play" such as n-time speed variable speed reproduction with respect to standard speed reproduction or reverse reproduction of the image data recorded on the optical disk. In reproduction of the image data, for example, n-time speed variable speed reproduction or reverse reproduction is generally required besides continuous reproduction of a standard speed, and a reproduction apparatus which satisfies these requirements becomes necessary. High speed retrieval is also required for the retrieval operation.

[0008] It is an object of the present invention to provide an optical disk and an optical disk reproduction apparatus each of which can conduct various kinds of trick play of the optical disk recording thereon compressed image data, and can make a retrieval operation at a high speed.

[0009] To accomplish the object described above, the optical disk according to the present invention records specific information necessary for trick play into an arbitrary area such as a TOC (Table of Contents) or a leading sector (sector 0) of the optical disk, and adds a sector address to each sector.

[0010] The optical disk reproduction apparatus according to the present invention includes means for extracting and reproducing an I picture, a P picture and a B picture contained in a GOP layer inside a bit stream of compressed image data by looking up a trick play table.

[0011] After the optical disk is loaded to the optical disk reproduction apparatus, a system microcomputer first reads the trick play table recorded on the optical disk and stores it into a work area. When trick play is effected, the address of the sector to be read out is determined by looking up the necessary trick play table, and the address is retrieved on the optical disk so as to reproduce an image.

[0012] Because the address of the sector to be read out is determined by looking up the trick play table during trick play other than normal reproduction, trick play can be easily executed, and a retrieved reproduction image can be quickly obtained in the retrieval operation.

BRIEF DESCRIPTION OF THE DRAWINGS

[0013]

Fig. 1 is a diagram showing a first embodiment of an optical disk according to the present invention; Fig. 2 is a diagram showing a second embodiment of the optical disk according to the present invention; Fig. 3 is a diagram showing a third embodiment of

the optical disk according to the present invention; Fig. 4 is a diagram showing a fourth embodiment of the optical disk according to the present invention; Fig. 5 is a diagram showing a fifth embodiment of the optical disk according to the present invention; Figs. 6A and 6B are diagrams each showing a sixth embodiment of the optical disk according to the present invention;

Fig. 7 is a schematic view showing a data format of the optical disk according to the seventh embodiment of the present invention;

Fig. 8 is a schematic view showing the data format of the optical disk according to the eighth embodiment of the present invention;

Fig. 9 is a schematic view showing the data format of the optical disk according to the ninth embodiment of the present invention;

Fig. 10 is a schematic view of tracks on an optical disk according to the present invention; and

Fig. 11 is a flowchart of an operation at the time of trick play.

DESCRIPTION OF THE PREFERRED EMBODIMENTS

[0014] Hereinafter, some preferred embodiments of the present invention will be explained with reference to the accompanying drawings. First, the embodiment shown in Fig. 1 will be explained.

[0015] Fig. 1 shows an optical disk according to the first embodiment of the present invention. The diagram shows a table for trick play on the optical disk. This trick play table records the numbers of pieces of music and movements (indices) and corresponding sector addresses for all the pieces and movements recorded on the optical disk, for example. Sector addresses are added to each sector of the optical disk, and this trick play table is recorded in an area such as a TOC (Table of Contents) or a leading sector (sector 0) of the disk.

[0016] When this optical disk is loaded to an optical disk reproduction apparatus, a system microcomputer first reads the trick play table and stores it in a work area. When trick play is effected, the address of the sector to be read out is determined by looking up this trick play table and is then retrieved on the optical disk so as to reproduce an image.

[0017] Because the address of the sector to be read out is determined by looking up the trick play table, retrieval can be carried out at a high speed.

[0018] Fig. 2 shows the optical disk according to the second embodiment of the present invention. The drawing shows the trick play table on the optical disk. The trick play table records all the sector addresses of the data recorded on the optical disk and the corresponding time codes. This trick play table is recorded in an area such as the TOC (Table of Contents) or the leading sector (sector 0) of the disk.

[0019] When this optical disk is loaded to the optical

disk reproduction apparatus, the system microcomputer first reads the trick play table and stores it in the work area. When trick play is effected, the address of the sector to be read out is determined by looking up this trick play table, and the address is retrieved on the optical disk so as to reproduce the image.

[0020] Because the address of the sector to be read out is determined by looking up the trick play table during trick play other than normal reproduction, trick play can be easily conducted, and retrieval can be made at a high speed.

[0021] When compressed image data of a variable transfer rate is reproduced, the sector address cannot be determined from the time code because the sector address and the time code do not have a proportional relationship, and correct retrieval cannot be made. However, the corresponding sector address can be obtained by looking up the trick play table of this embodiment, and retrieval can be correctly made.

[0022] Fig. 3 shows the optical disk according to the third embodiment of the present invention. The drawing shows the trick play table on the optical disk. The trick play table records all the sector addresses of the data recorded on the optical disk and their contents. This trick play table is recorded in an area such as the TOC (Table of Contents) or the leading sector (sector 0) of the disk.

[0023] When the optical disk is loaded to the optical disk reproduction apparatus, the system microcomputer first reads the trick play table and stores it into the work area. When retrieval is effected, the address of the sector to be read out is determined by looking up the trick play table, and this address is retrieved on the optical disk so as to reproduce the image.

[0024] Because the address of the sector to be read out is determined by looking up the trick play table during trick play other than normal reproduction, trick play can be easily conducted and retrieval can be made at a high speed.

[0025] Fig. 4 shows the optical disk according to the fourth embodiment of the present invention. The drawing shows the trick play table on the optical disk. The trick play table records an SH (Sequence Header) added to the leading part of a GOP recorded on the optical disk and its sector address. This trick play table is recorded in an area such as the TOC (Table of Contents) or the leading sector (sector 0) of the disk.

[0026] When the optical disk is loaded to the optical disk reproduction apparatus, the system microcomputer first reads the trick play table and stores it in the work area. When retrieval is conducted, the address of the sector to be read out is determined by looking up the trick play table, and the address is retrieved on the optical disk so as to reproduce the image.

[0027] Because the address of the sector to be read out is determined by looking up the trick play table during trick play other than normal reproduction, trick play can be easily conducted and retrieval can be made at a high speed.

[0028] Fig. 5 shows the optical disk according to the fifth embodiment of the present invention. The drawing shows the trick play table on the optical disk. The trick play table records the sector addresses of the start and the end of an I picture recorded on the optical disk. This trick play table is recorded in an area such as the TOC (Table of Contents) or the leading sector (sector 0) of the disk.

[0029] When the optical disk is loaded to the optical disk reproduction apparatus, the system microcomputer first reads the trick play table and stores it into the work area. When retrieval is conducted, the address of the sector to be read out is determined by looking up this trick play table, and the address is retrieved on the optical disk so as to reproduce the image.

[0030] Because the sector address of the I picture is determined by looking up the trick play table during trick play other than normal reproduction, trick play can be made by extracting only the I picture. The sector addresses of a B picture and a P picture can be recorded in the trick play table, and trick play can be carried out smoothly.

[0031] Figs. 6A and 6B show the optical disk according to the sixth embodiment of the present invention. Fig. 6A schematically shows the tracks on the optical disk. The tracks are spirally formed on the optical disk. Fig. 6B schematically shows a plurality of trick play tables 1, 2, 3 recorded in the tracks and their identification codes T1, T2, T3. When the optical disk is loaded to the optical disk reproducing apparatus, the system microcomputer reads the trick play tables recorded in the optical disk and stores them into the work area. In this instance, the system microcomputer can identify each trick play table by its identification code and can store it to a predetermined address of the work area. Therefore, even when any kinds of trick play tables exist, the system microcomputer can identify each table and can store it into the work table. In other words, the system microcomputer can determine the address of the sector by looking up a necessary trick play table during trick play and can easily effect trick play and at the same time, retrieval can be made at a high speed.

[0032] Fig. 7 shows the optical disk according to the seventh embodiment of the present invention. Fig. 7 schematically shows the data format recorded in the track on the optical disk. Each sector is further divided into blocks. The blocks contain a sync signal (Sync), a sector address (SA), a block address (BA), a parity (P), digital data (Data) and an error correction code (ECC). The same address is recorded for each block for the sector address.

[0033] Fig. 8 shows the optical disk according to the eighth embodiment of the present invention. Fig. 8 schematically shows the data format recorded in the tracks on the optical disk, and each sector is further divided into blocks. The blocks contain the sync signals (S0, S1), the sector address (SA), the block address (BA), the parity (P), the digital data (Data) and the error cor-

rection code (ECC). The sector address is recorded in two blocks and SA1 and SA2 together represent one address. Therefore, in comparison with the seventh embodiment wherein the same address is written for each block, the sector address may be written into every two blocks, and redundancy of the address is smaller and the address area can be made smaller than in the seventh embodiment.

[0034] Fig. 9 shows the optical disk according to the ninth embodiment of the present invention. Fig. 9 schematically show the data format recorded in the tracks on the optical disk. Each sector is further divided into blocks. The blocks contain the sync signals (S0, S1, S2), the sector address (SA), the block address (BA), the parity (P), the digital data (Data) and the error correction code (ECC). The sector address is recorded into two blocks, and SA1, SA2 and SA3 together represent one address. Therefore, the same block address may be written into every two blocks. Accordingly, redundancy of the address is smaller and the address area can be made smaller than in the seventh and eighth embodiments.

[0035] Fig. 10 schematically shows the tracks on the optical disk, and the spiral track is formed on the optical disk. Symbols $(x - 1)$, x , $(x + 1)$, ..., $(x + n)$ and $(x + n + 1)$ represent sectors, respectively, and the data are reproduced in this sequence during normal reproduction.

[0036] Hereinafter, the trick play operation will be explained about the operation at the time of reproduction at an n -time reproduction speed. It will be assumed that a command of reproduction at an n -time is inputted while the sector x is being reproduced in Fig. 10. First, after the data of the sector x is read out, $(x + n)$ as the next target sector is retrieved by track jump, or the like. The distance n from the initial position to the target sector is calculated by the system microcomputer in accordance with at which multiple speed the reproduction is to be made. After retrieval is so made, the data of the sector $(x + n)$ is read out and $(x + 2n)$ as the next target sector is again retrieved. Therefore, this operation is repeatedly carried out.

[0037] When the optical disk is loaded to the optical disk reproduction apparatus, the system microcomputer first reads the trick play table recorded on the optical disk and stores it into the work area. When trick play is conducted, the address of the sector to be read out is determined by looking up the necessary trick play table, and its address is retrieved on the optical disk so as to reproduce the image.

[0038] Fig. 11 shows the flowchart of the operation during the n -time speed reproduction described above. Here, symbol m represents a frame (field) interval of the I picture. When the command of n -time speed reproduction is inputted from an external input device such as a remote controller, whether the relation $m = n$ is first judged. When the result is $m = n$, only the I picture is retrieved by the trick play table and reproduction is carried out. When the result is $m < n$, the I picture is skip-

ingly retrieved and reproduced by the trick play table. When the result is $2m = n$, $3m = n$, and so forth, only the I picture is retrieved and reproduced. When the P picture is further retrieved and reproduced skippingly in addition to the I picture at this time, various speed reproduction can be made smoothly. When the result is $m > n$, the P picture is skippingly retrieved and reproduced by the trick play table in addition to the I picture. When the B picture is further retrieved and reproduced skippingly in addition to the I picture and the P picture at this time, various speed reproduction can be smoothly made. Thereafter, the operation described above is repeated if the n-time speed reproduction continues.

[0039] Though the explanation given above deals with the n-time speed reproduction operation, the present invention can be easily applied to reproduction in the reverse direction when n in the n-time speed reproduction is negative (-). Further, slow reproduction can be made when $|n| < 1$.

[0040] As described above, when retrieval is made by looking up the trick play table, image reproduction of the GOP unit can be easily made in the image data encoded by the MPEG system, for example. Therefore, besides the normal speed continuous reproduction operation, operations trick play such as slow reproduction, high speed reproduction, reproduction in the reverse direction, and the high speed retrieval operation become possible.

[0041] The present invention is not particularly limited to the foregoing embodiments but can be changed or modified in various ways without departing from the scope thereof.

[0042] In the optical disk according to the present invention, information necessary for trick play is recorded in an arbitrary area such as the TOC (Table of Contents) or the leading sector (sector 0) of the disk, and the sector address is added to each sector. The optical disk reproduction apparatus looks up the trick play table, and extracts and reproduces the I picture, P picture and B picture contained in the GOP layer inside the bit stream of the compressed image data. Accordingly, the present invention can easily execute trick play such as slow reproduction, high speed reproduction, reproduction in the reverse direction and the retrieval operation. It is obvious in the explanation given above that the image data may be the moving picture or the still picture. It is further obvious that the present invention can be similarly applied to the audio data or control data carried by the image data.

Embodiments

[0043]

1. A method of recording image data on an optical disk, wherein the recording image data comprises several sectors and a sector address recorded in each of respective sectors thereon, said method

comprising the steps of:

compressing image data to a variable transfer rate;
arranging a table containing information correlating said sector addresses and presentation time of the compressed data, a relationship between said sector addresses and said presentation time being inconstant; and
arranging image data associated with a desired presentation time which can be selectively reproduced by looking up the table correlating said sector addresses and said presentation time.

2. A method of reproducing image data from an optical disk having recorded therein said image data consisting of a plurality of sectors arranged on said optical disk, and a sector address recorded in each of respective sectors thereon, said image data at least comprising compressed image data having a variable transfer rate, and said optical disk has a table containing information correlating said sector addresses and presentation time of the compressed data, a relationship between said sector addresses and said time being inconstant, said method comprising the steps of:

detecting the sector address to be read out of a desired image data associated with a desired presentation time by looking up the table correlating said sector addresses and said presentation time; and
retrieving the detected address on the optical disk so as to reproduce an image.

Claims

1. An optical disk recording thereon main information including a plurality of sectors having sector addresses, respectively wherein:

said main information includes image data compressed with a variable transfer rate;

said optical disk has a plurality of tables for trick play containing at least a table representative of a relationship between said sector addresses and time information of the compressed image data, and a table representative of a relationship between a picture of said compressed image data and said sector addresses; and

a required image data can be selectively reproduced by looking up the sector addresses in the tables for trick play.

2. An optical disk according to claim 1, wherein:

said optical disk records thereon an identification code for distinguishing the tables for trick play; and 5

said identification code identifies a required table for trick play so that a required image data can be selectively reproduced by looking up the sector addresses in the identified table for trick play. 10

3. An optical disk reproduction apparatus for reproducing image data recorded on an optical disk wherein: 15

said optical disk records said image data formed by a plurality of sectors each of which has a sector address; 20

said image data is compressed with a variable transfer rate;

said optical disk further includes a plurality of tables for trick play containing at least a table representative of relationship between said sector addresses and time information of the compressed image data, and a table representative of a relationship between a picture of said compressed image data and said sector addresses; and 25 30

said apparatus includes;

means for detecting a sector address for reproducing a required image data by looking up said tables for trick play; and 35

means for retrieving the detected sector address on the optical disk to reproduce the required image data. 40

4. An optical disk reproduction apparatus according to claim 3, wherein: 45

said optical disk has an identification code for identifying said tables for trick play; said apparatus further includes means for identifying a required table for trick play on the basis of said identification code; and 50

a sector address for reproducing a required image data is detected in said identified table for trick play by means for detecting said sector address to reproduce said required image data. 55

FIG. 1

INDEX NO.	SECTOR ADDRESS
1	00000
2	0001F
3	00027
4	0004B
.	.
.	.
.	.

FIG. 2

SECTOR ADDRESS	TIME CODE
00000	00:00:00
00001	00:00:01
00002	00:00:02
00003	00:00:03
.	.
.	.
.	.

FIG. 3

SECTOR ADDRESS	CONTENT
00000	CONTENT 1
00001	CONTENT 2
00002	CONTENT 3
00003	CONTENT 4
.	.
.	.
.	.

FIG. 4

SH (SEQUENCE HEADER)	SECTOR ADDRESS
SH1	00000
SH2	0001F
SH3	00027
SH4	0004B
.	.
.	.
.	.

FIG. 5

I PICTURE	SECTOR ADDRESS
I1	00000
I2	0001F
I3	00027
I4	0004B
.	.
.	.
.	.

FIG. 6A

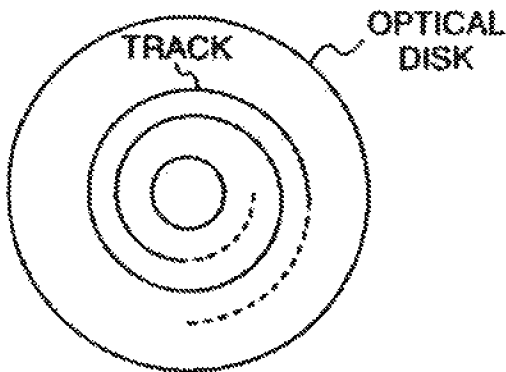


FIG. 6B



FIG. 7

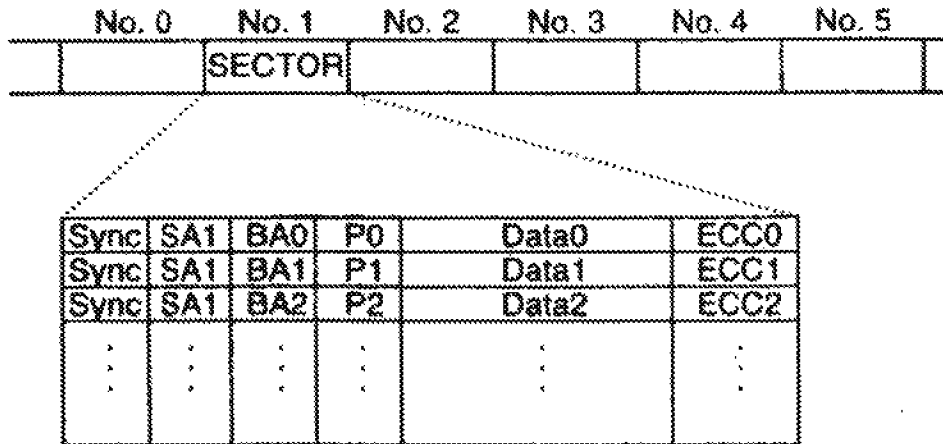


FIG. 8

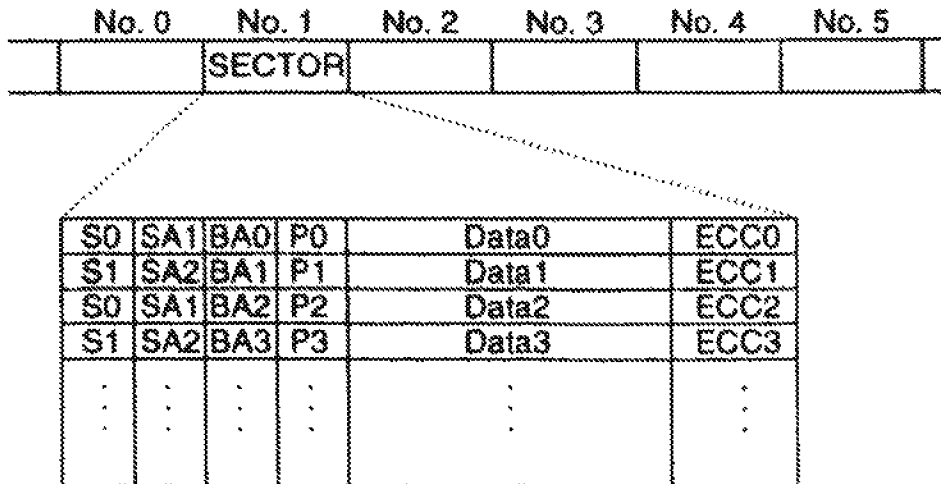


FIG. 9

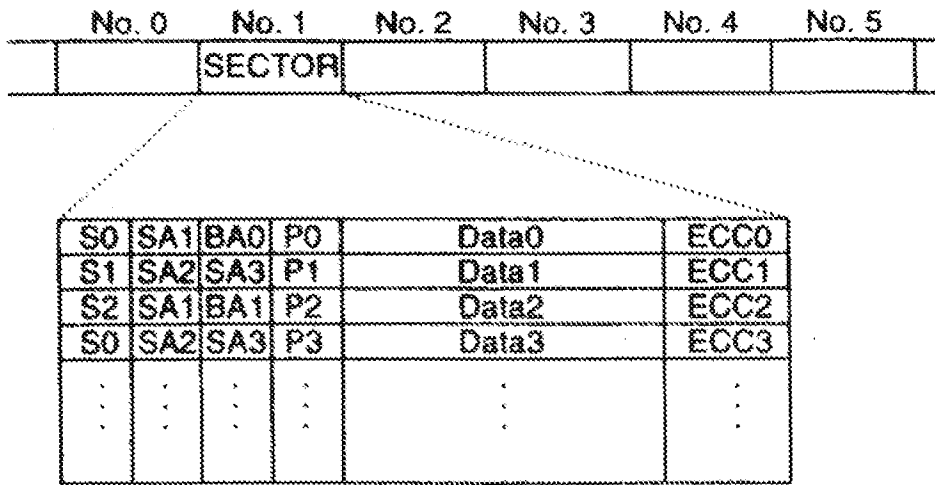


FIG. 10

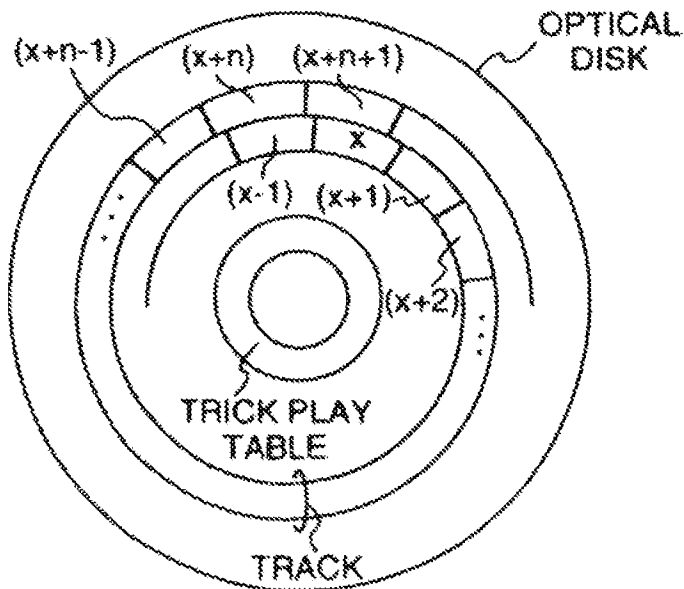
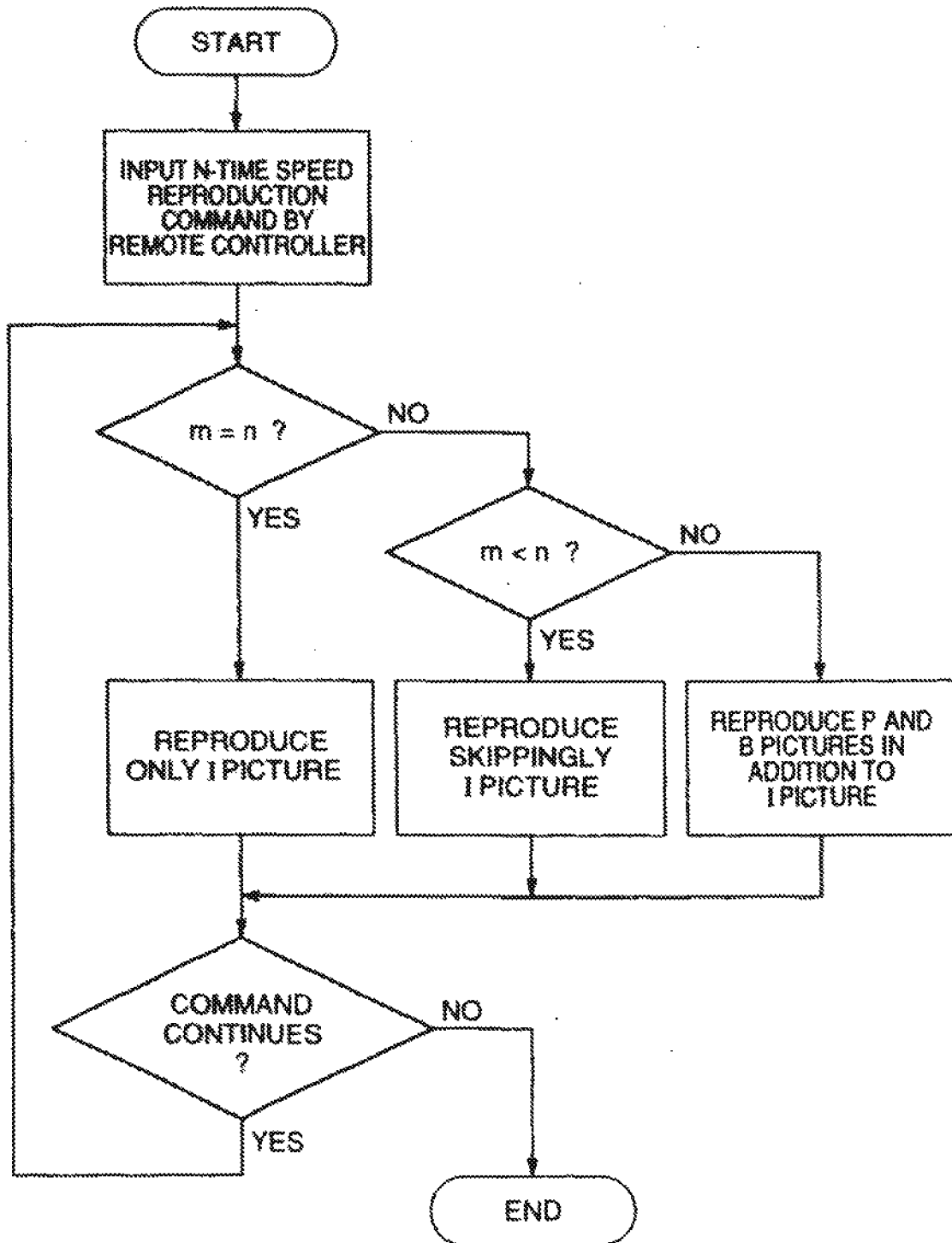


FIG. 11



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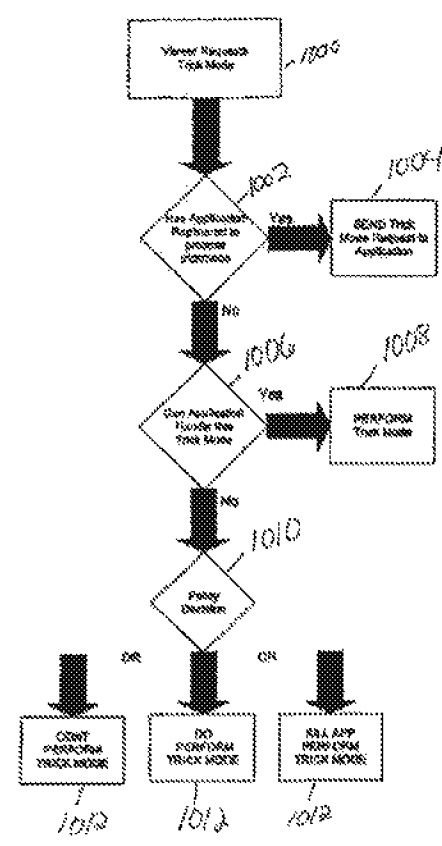
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(54) Title: METHOD AND SYSTEM FOR CONTROLLING RECORDING AND PLAYBACK OF INTERACTIVE APPLICATIONS.



(57) Abstract: Disclosed are methods and systems for controlling the playback and recording of television programming containing interactive applications. In particular, the disclosed methods and systems detail how "trick modes" can be handled when playing applications that are distributed with the television programming.

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METHOD AND SYSTEM FOR CONTROLLING RECORDING AND PLAYBACK OF INTERACTIVE APPLICATIONS

Field of the Invention

[0001] The invention relates generally to digital broadcasting systems and methods, and more specifically to control and playback of programs containing interactive applications.

Background

[0002] Interactive television systems provide a means to deliver interactive content as well as ordinary television audio and video programs to a large number of subscribers. Programs broadcast by these systems may incorporate television audio and video, still images, text, interactive graphics, data, executable applications, locators, metadata and many other components. The interactive content of the interactive television program may therefore include application code, data associated with the audio and video, control signals, additional audio and video, still images, text, raw data, internet addresses and many other types of information.

[0003] Interactive content such as application code or information relating to television programs is often broadcast to a receiver, retrieved on demand from one or more servers at a remote site, or stored locally. In an on-demand interactive system, a return path is necessary for sending requests from a client to a server and subsequently retrieving the interactive content from the server. Once retrieved from the server, the supplemental content is received by the receiver and displayed on the same screen concurrently with the audio video program or may, alternatively, replace the audio video program, for example. Alternatively, a second device (such as a PC, PDA, web tablet, web phone, etc.) can be used to present the supplemental content. Further, while the interactive application can be fetched on demand and forwarded over the same transmission service as the broadcast program, it could also be

fetches and forwards to the receiver station from a separate network. For example, the interactive application could be fetched and received from an online information provider, such as the Internet, while the audio video program is received over a conventional broadcast cable system.

[0004] When interactive content is broadcast, the interactive content is usually broadcast in a repeating format. In other words, each piece of information is broadcast a first time, then each is transmitted a second time, and so on. The cycle is repeated so that each piece of interactive data is transmitted, for example, every ten seconds. The pieces of information which are broadcast in this manner form what is referred to as a "carousel." The sequence of information that makes up the carousel can be prepared in advance, or it can be determined "on the fly."

[0005] Broadcast systems (e.g., interactive television systems) transmit information in a carousel format in order to allow receivers in the system to selectively obtain particular pieces of information in the carousel without requiring a return path from the receivers to the server. If a particular receiver needs a particular piece of information, it can simply wait until next time that piece of information is broadcast to obtain the information. If the information were not cyclically broadcast, the receiver would have to transmit a request for the information to the server, thus requiring a return path. Other receivers in the system can operate in the same manner, each receiver waiting for the information it needs, and then using only that information. By employing carousels to broadcast information, the system eliminates the need to connect each of the receivers with the server and further eliminates the need for the server to process individual requests for information.

[0006] If information needed is not cyclically broadcast, the receiver, if equipped with a suitable modem, could transmit a request for the information to a server, using what is called

a return path. Other receivers in the system can operate in the same manner, each receiver waiting for the information it needs, and then using only that information.

[0007] The pieces of information, or data objects, in a carousel are often intended to be combined to form a single program. For example, an interactive television game show may combine audio, video and interactive content, such as application code which allows users to answer questions and compete against each other. The application code may be downloaded along with the data for the quiz show for example, or may reside locally, either on the device used to process the data or somewhere accessible on a home network, for example. Another example of an enhancement would be a news program which combines audio and video with application code that inserts current stock prices in a banner at the bottom of the screen. (It should be noted that many types of programs are possible, and it is not necessary to include either audio, video or interactive content in any particular program. A program might contain only audio and interactive data (e.g., an interactive radio program,) or it might contain only interactive data (e.g., an interactive weather program that does not contain audio or video streams.)

[0008] Various recording and playback devices, such as personal video recorders (PVRs), have been developed and commercialized in recent years allowing a viewer to "fast-forward", "rewind", "replay" or "pause" an audio video program when the viewer of the broadcast is monitoring the programming concurrent with its reception. These systems typically use memory devices such as a hard disk for storing the audio video program and playing back the program with near-perfect quality.

[0009] A control device on a typical PVR, for example, maintains the addresses of segments of the recorded program in the memory device, so they can be reassembled in the proper sequence for playback. Audiovisual display is controlled by user interaction. The control device is responsive to commands received from the viewer. Control of such a

memory device to implement the various desired functions set forth above are well known within the skill in the art.

[0010] The problem with current interactive television systems is that because a viewer controls the audiovisual display by viewer interactions, if a viewer wants to interact with an enhancement due to an interactive application, the audiovisual program will continue playing notwithstanding the viewer's lack of attention. In this manner, the viewer may miss portions or an entire commercial, for example, unless the viewer immediately upon interaction with the interactive TV application specifically commands the program to stop and then later indicates that they desire to resume viewing of the program. Even if the commercial continues to play on the screen, the viewer is now expressing interest elsewhere.

[0011] Accordingly, a need exists for a system and method that allows a viewer to interact with an interactive application without missing material in the currently played audiovisual program.

[0012] Another problem is that current PVR systems are not adequately designed to handle enhanced programming when using "trick" modes. Prior to the advent of PVR technology, it was safe for applications to assume that they always were run at the same time as they were broadcast, and that the program they are a part of progressed as a constant and well-understood rate. Therefore, many existing applications have explicitly or implicitly included assumptions that these facts are true, and will not run properly if they are played back at a different time or different rate from how they were originally broadcast, e.g., trick mode operations. Trick mode operations are basically any operation which change the speed or direction from normal forward playback. This also includes setting the playback to a different playback position. These assumptions are not a strict either-or proposition. Some applications may be able to handle some changes in these parameters and not others (for instance, an interactive application may be able to handle being played fast-forward, but not

rewound, or an interactive application may be able to handle being played back at a later date, but only if it is played back at a constant rate).

[0013] In addition, some interactive applications will only be able to handle these changes if they remain in control of when and how the changes occur -- doing their own processing of the pause, play, rewind, and fast-forward keys. This is potentially at odds with the network's interests to control those behaviors, either to ensure consistency or to support particular business models (like paying extra for the right to fast-forward through commercials). However, even with such networks, there may be a few applications that the network trusts to do their own trick-mode processing.

[0014] Further, because the program may include different interactive applications which are in various states throughout the program, it is necessary to maintain the proper states for these applications, even when parts of the program are skipped in special playback modes. Further, the applications may interact with other data objects, so it may be necessary to generate signals that would not otherwise be generated in a special playback mode.

[0015] It is possible to write applications that properly handle special modes, as long as the application receives proper notification of any changes in the location/rate of playback. However, this takes some effort on the part of the application developer, and not all developers will be willing to make the effort to support all special modes. Thus, it becomes necessary for the system to take action to handle applications that are unable to handle trick modes.

[0016] Yet another problem with current PVR systems is that they are unable to adequately integrate the use of "trick" modes when recording variable rate streams. The use of trick modes typically requires metadata that indicates the correspondence between play-time and location of the data on the recording media. For example, if a user wishes to use a

trick mode to jump ahead 30 seconds into the programming, metadata that indicates where to jump to on the recording medium is required.

[0017] The usual approach for keeping track of the correspondence between play-time and location of the data on the recording media is to maintain a map from play time to stream offset (or file location). Consequently, the ability to randomly access through the file can be facilitated by maintaining a table of times and offsets, where in order to access to time T in the stream, the file must be played from the offset O . Thus, a file can be considered as having an ordered list of pairs $T(i), O(i)$ for the stream. Normally, it is not difficult to build such an ordered list within a set top box when the stream is being sent at the rate at which it is meant to be played back. This is because the correspondence between $T(i), O(i)$ follows a single formula. However, when the stream is being "dripped" at a variable rate, the correspondence is not constant. Accordingly, a need exists for determining the correspondence between play-time and location of the data on the recording media for a program recorded at a variable rate.

Summary of the Invention

[0018] To solve the above and other aspects, the present invention provides a system and method for using a recording device to automatically delay or time shift a program, such as an audio video program, for the typically variable length of time necessary to allow interactions desired by the viewer. The present invention provides a system for controlling the playback of an audio, video and/or other content as the viewer begins to interact with an interactive application, which may contain code and data. Once the viewer is done interacting, the program is resumed where it left off.

[0019] With respect to the present invention, it does not matter if the interactive application, including code and content, is broadcast to the receiver station as part of the same service as the audio video program, is fetched from local storage, or separately fetched

on demand from a server at a broadcast or from an online information provider. Moreover, the invention covers combinations of the above where the interactive content is retrieved with the interactive code or separately from local storage, external storage to the receiver station (such as a PVR), from a device on the home network, from a broadcast station, from a LAN, private network, Internet or other online information provider.

[0020] In the method of the present invention, the program is played back from a local recording device, which could be in a set top box or external to the set top box, or is received from a broadcast. The receiver station begins to play an interactive application, containing code and content data. Upon receipt of a viewer command indicating that the viewer desires to interact with the interactive application, display of the program is automatically stopped. In the case of the broadcast program, a command is sent to the storage device to begin recording the program. In the case of the prerecorded program, the recording device is commanded to cease outputting data associated with the audio video program. Further, the device maintains a pointer at the memory location where the audio video data was stopped for later recall. Upon completion of the viewer interaction with the interactive program, the receiver station automatically resumes playing the audio video program.

[0021] Thus, a further object of the present invention is to provide an automatic time shift of a broadcast program being played concurrently with its reception at a receiver station upon viewer interaction with an interactive application and subsequent resumption of the broadcast program when the viewer is done interacting.

[0022] Another object of the present invention is to provide an automatic time shift of a pre-recorded program being played from a memory storage at a receiver station upon viewer interaction with an interactive application and subsequent resumption of the pre-recorded program when the viewer is done interacting.

[0023] Yet another object of the present invention is to provide a system and method for determining what kind of playback options "trick" modes an interactive application can handle. The system preferably can allow some interactive applications to handle some of their own playback options. Alternatively or in addition, the system preferably is configured to determine what playback options are approved to be used with the interactive applications allows a user access to access these approved options.

[0024] A further object of the present invention is to provide flexibility to networks in how they handle PVR functionality as it relates to interactive applications.

[0025] Yet a further object of the present invention is to provide a method of simplifying the processing required at the receiver to determine the correspondence between play time of recorded variably dripped content and location in the storage media.

[0026] These together with other aspects and advantages which will be subsequently apparent, reside in the details of construction and operation as more fully hereinafter described and claimed, reference being had to the accompanying drawings forming a part hereof, wherein like numerals refer to like parts throughout.

Description of the Drawings

[0027] The invention can be understood by reference to the Detailed Description of the Invention when taken together with the attached drawings, wherein:

[0028] FIG. 1 is a functional block diagram of an interactive television system,

[0029] FIG. 2 is a diagram illustrating the structure of a carousel and a corresponding data stream;

[0030] FIG. 3 is a flow diagram illustrating one method for controlling the playback of recorded programming that includes an interactive application;

[0031] FIG. 4 is a flow diagram illustrating an embodiment of the present method in the case where there is more than one event;

[0032] FIG. 5 is a flow diagram showing how a recording system can handle a request for recording content that includes an application;

[0033] FIG. 6 is a flow diagram showing a method for initiating playback of recorded applications;

[0034] FIG. 7 is a flow diagram illustrating the detection of an application in a system configured to receive a program as a data stream is shown;

[0035] FIG. 8 is a diagram showing how playback of programs containing applications can be controlled;

[0036] FIG. 9 is a flow diagram illustrating how playback of applications are handled;

[0037] FIG. 10 is a diagram illustrating how the system handles trick mode request signals;

[0038] FIG. 11 illustrates a first process for determining the time and offset relationship for a variably dripped stream;

[0039] FIG. 12 illustrates a second process for determining the time and offset relationship for a variably dripped stream; and

[0040] FIG. 13 illustrates a third process for determining the time and offset relationship for a variably dripped stream.

Detailed Description of the Invention

[0041] Personal Video Recorders (PVR) allow viewers to record selected television programs on command. Viewer can then determine when to view the recorded programs. In addition, PVRs typically allow the viewer several features "trick" modes. One such trick mode is the ability to pause and rewind during the recording of a live broadcast. The recorded portion may then be viewed later or skipped to catch up to the real-time broadcast. Another possible use of the PVR is to record one television show while playing back another, previously recorded show. Typically, the PVR achieves these feats by recording compressed

video signals on storage devices such as hard-disk drives so that they can be played back on command.

[0042] The storage devices are typically part of the viewers system. They can be integrated in the viewer's receiver/set-top box or they can be part of a separate component of the viewer's system. Alternatively, the storage device can be located at a remote location away from the viewer's location. A so called "network PVR" works by placing the storage device at a remote location, for example the location of a broadcaster. A user is then able to control playback by communicating with the broadcaster over a network. The recorded programming can be provided to the viewer through the network or through another medium. Many embodiments described herein make specific reference to PVRs located at the viewers location and integrated into the viewers set-top box. These embodiments are meant only to be exemplary. Many of the principles apply equally to network PVRs and other storage systems used for recording and controlling the playback of television programming.

[0043] Interactive television systems provide a means to deliver interactive content as well as ordinary television audio and video to a large number of subscribers. Programs broadcast by these systems may incorporate television audio and video, still images, text, data, locators, metadata, interactive graphics and applications, and many other components. The interactive applications of the interactive television signal may therefore include application code, data associated with the audio and video, control signals, raw data, internet addresses and many other types of information. Disclosed are systems and methods for integrating interactive programming into PVR systems.

[0044] Referring to FIG. 1, a functional block diagram of an interactive television system is shown. The interactive television system generally comprises a broadcast station 100 and a receiving station 102 coupled to the broadcast station 100 by a broadcast medium 104. In this figure, the broadcast medium 104 is depicted as a satellite transmission network. The

broadcast medium 104 may, in other embodiments, comprise other transmission means such as cable, telco, MMDS (microwave) and terrestrial transmission media. Broadcast station 100 is coupled to a program source 102 which is configured to provide the data which forms the program. The program source 102 could also be an operations center which broadcasts the data to a cable headend.

[0045] Receiving station 106 includes a receiver which is preferably coupled to a recording device 108. Receiver 106 is typically implemented in a set-top box which is connected to a television 110. Alternatively, the receiving station 106 could be integrated into the television. The receiving station could also be a PC with the computer monitor substituting for the television. Alternatively, the television could be used for display of the primary program and the PC (or PDA, web phone, etc.) for playing the interactive application including code and data, commonly known as a "two box" configuration. In any event, the present invention is operable and covers without limitation any receiving apparatus known in the art.

[0046] Receiving station 106 incorporates a control unit (e.g., a microprocessor,) a memory, and other components which are necessary to select and decode the received interactive television signals. Because the basic components and features of receiving stations 106 such as set-top boxes are known, they will not be discussed in detail here. Recording device 108 is a conventional personal video recorder (PVR), the operations of which are within the skill in the art.

[0047] Typically, set-top boxes are designed to provide the necessary interactive functionality at a minimal cost. Consequently, they normally have a limited amount of memory and no mass storage devices (e.g., hard disk drives.) While the memory is sufficient to execute interactive applications, it is not adequate to store the applications for an indefinite

period of time. Therefore, the applications do not normally remain in memory when they are no longer being executed.

[0048] Even if the memory of the set-top box were large enough to store some interactive applications, it might still be too small to accommodate a program which includes large amounts of audio or video data, application code, or other information. In one embodiment of the present system, recording device 108 is coupled to the set-top box to provide sufficient storage to record programs that will not fit in the limited amount of memory in the set-top box. Recording device 108 may comprise any suitable storage device, such as a hard disk drive, a recordable DVD drive or optical disk drive. It can be internal to the set-top box, or it may be connected externally. Recording device 108 can be connected permanently or removably to the set-top box.

[0049] Interactive applications such as application code or content relating to an interactive television program can be retrieved at the receiving station 106 in many different ways as understood by one skilled in the art. The interactive content and/or code could already be resident in storage at the receiving station 106. The interactive content and/or code could be stored at the broadcast station 100 and broadcast to the receiving station 106 with or as part of the audiovisual primary program, as discussed in more detail below in relation to "carouselling". Alternatively, the interactive content may be stored at a different location from the interactive code and when the interactive code is executed, the interactive content could be fetched from a server at the broadcast station 100, online information provider 112, home network, amongst other locations. For example, the interactive content could be stored at a server associated with an online information provider 112 (e.g., the Internet, Web, Intranet, public network, private network, etc.) and could be retrieved from the receiver station during the playing of an audiovisual program. For example, a program may include, or be accompanied by, triggers which when extracted are used by the receiving

station 106 to access the interactive content and/or code. In one such embodiment, the triggers could be addresses or reference addresses for one or more sites on an online information provider network. At certain predetermined times or when received and extracted from a datastream at the receiving station 106, these triggers can be used to either automatically or upon user command establish a communications link with the online information provider 112 site for the retrieval of interactive program.

[0050] As referred to above, interactive applications can also be broadcast in a repeating format. In other words, each piece of information is broadcast a first time, then each is transmitted a second time, and so on. The cycle is repeated so that each piece of interactive data is transmitted, for example, every ten seconds. The pieces of information which are broadcast in this manner form what is referred to as a "carousel." The sequence of information that makes up the carousel can be prepared in advance, or it can be determined "on the fly."

[0051] Broadcast systems (e.g., interactive television systems) transmit information in a carousel format in order to allow receivers in the system to selectively obtain particular pieces of information in the carousel without requiring a return path from the receivers to the server. If a particular receiver needs a particular piece of information, it can simply wait until next time that piece of information is broadcast to obtain the information. If the information were not cyclically broadcast, the receiver would have to transmit a request for the information to the server, thus requiring a return path. Other receivers in the system can operate in the same manner, each receiver waiting for the information it needs, and then using only that information. By employing carousels to broadcast information, the system eliminates the need to connect each of the receivers with the server and further eliminates the need for the server to process individual requests for information.

[0052] In one embodiment, the data objects of a program which are to be broadcast from broadcast station to receiving station are stored at the same source as used to store the program. The data objects may be stored separately (e.g., as independently accessible files,) or they may be stored as a preconstructed data stream. If the data objects of the program are stored as individual files, they are retrieved by broadcast station from program source to be sequentially broadcast. If the program is stored as a preconstructed data stream, the stream can be broadcast essentially as it is stored. The program data may be compressed and control information may be added to the data for use by the interactive television system. The program data and any additional information is then converted by broadcast station to a format suitable for transmission over broadcast medium. In this particular embodiment, the data is formatted into packets which can be transmitted over a digital satellite network. These packets may be multiplexed with other packets for transmission.

[0053] Broadcast station transmits the data objects of the program in a carousel which is cyclically transmitted to receiving station. This produces a stream of data in which each data object is transmitted repeatedly. It should be noted that the broadcast medium (a digital satellite network in this embodiment) can support a number of different channels, and that different carousels (and corresponding data streams) can be concurrently broadcast on these channels. When receiving station receives the data stream, the program contained in the data stream may be played immediately or it may be recorded. If the program is to be played immediately, receiving station converts the data stream back into the data objects and uses them as necessary in the program. If the program is to be stored, it may be parsed into the individual data objects and stored as a set of files, or it may be stored as a data stream, as it was received. If the program is to be stored, it is conveyed to a recording device. The program may be stored whether it is immediately played or not.

[0054] Referring to FIG. 2, the structure of a carousel (and a corresponding data stream) which is transmitted to the receiver is illustrated. Carousel 24 comprises data objects 21-23 and carousel information 20. Data objects 21-23 are retrieved from the same source as the program as described above. Carousel information 20 is provided by the broadcast station and may contain information such as the carousel ID and version number, the validity range of the carousel, a file access table or directory for the carousel, and various other information. (Portions of this information, such as validity range data, are not necessary in programs which are intended for immediate consumption.) The broadcast station transmits carousel information 20 and data objects 21-23 sequentially. The first instance of the transmission of carousel 24 is indicated by 25. After the broadcast station has completed transmission of the first instance of carousel 24, it is transmitted again, as indicated by 26. The successive, cyclical transmissions of carousel 24 indicated by 25-29 form data stream 30. Transmission of the carousel may be repeated indefinitely.

[0055] As mentioned above, the data objects which comprise a program may include application code, audio and video data, control signals, raw data and other types of information. If the program is to be immediately consumed (i.e., presented to the user,) the data must be parsed to extract the data objects from the stream. When the necessary data objects have been extracted, the program is played. The data objects are used as defined in the program. For example, any applications which need to be executed are launched, any audio or video data which needs to be presented to the user is played or displayed, any signals which need to be produced are generated, and so on. The program is presented to the user, typically via a television, and is consumed. Regardless of whether or not the program is immediately presented to the user, it can also be stored. The recording device can be used to store programs "as is" (i.e., as a data stream which is essentially the same as that received in the broadcast signal) or as a set of files that can be individually accessed or updated. In either

case, the recorded program can be played back. The present system and method are employed to facilitate and/or enable the use of playback features such as trick play modes when viewing the recorded program. To illustrate the advantages of the system and method, it may be useful to examine the structure of a program.

Switching from Programming to Interactive Applications

[0056] FIG. 3 is a flow diagram illustrating one method for controlling the playback of recorded programming that includes an interactive application. The method is described with reference to an "audiovisual" program. However, the present invention is not limited to a program containing audio video content but could include any of the following, separately or in combination; audio, video, graphics, data, text, metadata, interactive application, locators, amongst other components.

[0057] Referring again to Figure 3, and particularly with respect to the prerecorded program, after the program is recorded on a recording device, playback of the program is initiated at 300. If the interactive application is contained as part of pre-recorded program, the receiver is configured to detect applications in the recorded data at 302. The manner in which applications are detected in the program depends upon how the program was stored.

[0058] If the application was recorded as a data stream, the receiver detects an application by examining the sequential stream of data which is played back from the recording device. When the stream contains information indicating that the application is available, the receiver detects this information and thereby detects the application. The application is then launched at 304.

[0059] If the program was recorded as a set of files, the detection of applications in the program proceeds in a different manner. When playback of the program is initiated, the receiver examines the stored files. In one embodiment, the application files include information defining validity ranges for the corresponding applications. The receiver

compares the validity range for each application to a current playback index. If the current playback index falls within the validity range of a particular application, that application is considered to have been detected, and is launched.

[0060] Alternatively, the interactive program could be wholly separate from the pre-recorded program. For example, a trigger could be detected in the pre-recorded program which would allow the interactive application to be accessed and launched according to one of the methods set forth above. For example, the interactive application, which could include code and data, could be stored in local storage at the receiver station, at the broadcast station, or at an online information provider site. If stored at the broadcast station, a request must be sent on the return path back to the broadcast station whereby the interactive application is accessed from a server, for example, and subsequently broadcast to the receiver station where it is detected and launched. In yet another embodiment, an icon or other indicator could be presented to the viewer indicating that an interactive application is available. Upon viewer command, the interactive application could be retrieved from local (i.e., storage within the receiver station) or external storage (storage remotely located from the receiver station including broadcast station or online information provider) and launched.

[0061] In another embodiment, several applications may reside on the receiver or on some other consumer electronics device attached to the receiver. In this case, the application to be launched, possibly automatically without even requiring user intervention, might be determined by the type of data in the stream. A typical example of such an application and associated data would be a web browser and some xml data.

[0062] Referring again to Figure 3, when either the application is detected in the program or retrieved separately from internal or external storage, the interactive application is launched at 304. Once launched, the viewer may choose to interact with the presentation by selecting an option presented as part of the interactive application. For example, the viewer

could select a possible answer to an interrogatory presented as part of a graphics overlay on a video program. For example, a commercial could be running and the viewer could respond affirmatively to an interrogatory presented on a graphics overlay asking if the user would like more information on the product presented in the commercial. Alternatively, an icon could be presented on the screen indicating to the viewer that enhanced content is available. The viewer could respond by any means known by those skilled in the art including without limitation depressing a key on a remote or keyboard, speaking a voice command to be processed by voice recognition component in the receiver station, amongst other ways.

[0063] Once the viewer command is detected by the system at 306, an interrupt could be sent to the interactive application. In other words, a control task or another native or broadcast process could receive notification of a key event that is directed to the interactive application. For example, in some systems, multiple applications may reside on the receiver. Some of those applications may execute natively (consisting of executable code for the particular processor in the receiver) whereas others of them may use an interpreter or virtual machine in which to execute. A control task is a particular type of application that can be furnished by the network operator or by the consumer electronics manufacturer. In either case, the primary objective of the control task is to decide matters of "policy." Examples of decisions that could be made by a control task include (1) which events can be delivered to which other applications and which they will handle directly; (2) which applications will be allowed to access certain peripherals such as the tuner or modem; and (3) whether to terminate particular applications when resources are running short. These are just a few examples of the types of policies which a network operator and/or consumer electronics manufacturer may wish to establish via a control task. In any case, a control task may execute natively or inside an interpreter or virtual machine.

[0064] In FIG. 3, after detecting a viewer interaction a determination of whether the audio video program is a broadcast or recorded program is made at 308. If the audio video program is broadcast and currently played upon reception, a command is sent from the receiver station to the recording device to begin recording the audio video program at 310 if the broadcast program was not already being recorded in the recording device. If the broadcast program is continuing to be recorded, the read point of the location of the video and/or audio in the recording device where the viewer started interacting is maintained by the system.

[0065] Referring to Figure 3 with respect to the broadcast program, a command is sent from the processor in the receiver station to the audio, video and/or data decoder to stop playing out the program at 312 resulting in the removal of the video from the screen and stopping the play of the audio content from the speakers. Of course, ceasing playback of the pre-recorded program from the recording device provides the same result of stopping the play of the program.

[0066] Any content, whether graphics, text, stills, voice and/or audio, associated with the interactive program preferably is continued to be played on the screen or speakers. The system preferably has a way to ensure that if the interactive application includes video or audio data that the content will continue to play, preferably without interruption. One way to ensure interactive play is through the use of metadata indicating which content should be "paused" and which content should continue playing for the viewer. Metadata can be associated with segments of content for use by the system. This metadata may be received at the receiver station as part of signaling information, as part of the content or as part of an application. Alternatively, a table, such as an Event Information Table, can be retrieved by the receiver station which indicates event states and control flow.

[0067] In an alternative embodiment, instead of pausing the program during user interaction with the interactive application, the program is played in a loop along with the

interactive application. For example, if the interactive application appears during commercial programming, the commercial containing the application can continued to be played along with the application, when the commercial ends, the programming could be paused or the programming could be looped back to the beginning of the commercial and the commercial could be played again while the viewer interacts with the application.

[0068] Referring to Figure 3, the next step 316 is to detect when the user stops interacting with the interactive application. This could be accomplished by the interactive application calling an exit routine or by receiving a command from the viewer indicating their intent to terminate the session. Typically, computer programs or applications can be written to be either finite in length or infinite (in case they sit in a loop waiting for a network signal, key depression, etc.) Finite applications typically end either with the programmer including a specific call to an exit routine or simply syntax that indicates the end of the application. In the latter case, when the program is compiled or interpreted, a run-time library is typically linked in which will call the exit routine. The exit routine is typically reflected to the operating system or middleware so that such can reclaim the resources that were being used by that application. With this invention, part of the process involved within the operating system or middleware exit routine may be to resume a video, and/or other interactive application (see Figure 4). An example where the viewer controls the exit would be the following. The viewer may be retrieving additional information about a product in a commercial from the interactive application. When completed, the interactive application can present a query or "termination" icon on the screen which the viewer could click on by depressing a key on a remote, for example. Another alternative would be to allow the viewer a certain time period to interact. If the viewer does not interact within such period, the system detects that a user has stopped interacting. It is understood as within the skill of the

art that there are many ways for determining when a viewer has stopped interacting with the interactive application.

[0069] Referring again to Figure 3, once the system detects the viewer has stopped interacting at 316, a command is sent to the recording device to retrieve the program. Preferably, the read point of the location of the video and/or audio in the recording device is maintained by the system. For example, the programming could then begin playing again on the screen from the same point where it was stopped (i.e., where the program was originally "paused") at 318. Alternatively, the program could begin playing at any point automatically identified by control commands, by an event information table, or by viewer manipulated remote control which permits the viewer to select the portion of the recorded program to be viewed, for example.

[0070] The present invention also pertains to "nested recordings" as shown in Figure 4. This is the case, for example, when a viewer interacts with an application accompanying a television program, then views a commercial and requests additional information about a product advertised in the commercial. After requesting the information, they may return either back to the commercial or the program, where the choice of where to return may be set by the network operator, the supplier of the content, the supplier of the software that runs on the receiver, or set as a default by a customer. For example, a viewer could be watching audiovisual program A at 400, which could include an interactive application. The viewer can choose to launch the interactive application at 402. When a new interactive program B is detected at 404, which, for example, includes an interactive application, it is launched and displayed to the viewer, perhaps in a picture-in-picture or side-by-side arrangement with program A.

[0071] At this point, the interactive application that accompanies program A can be "paused." For example, the system may pause program A automatically when the viewer

chooses to interact with the interactive application B at 406. When the viewer interaction is detected by the system at 406, the receiving station automatically ceases playing program A and effectively "pauses" program A, perhaps also pausing an application associated with Program A at 408. The viewer is now watching audio visual program B which contains another interactive application C, which is then launched at 410. If the viewer now indicates their desire to interact with interactive application C at 412, program B stops playing automatically at 414 and is effectively "paused." The system now starts executing program C at 416. When the receiving station determines that the viewer stops interacting with interactive application C at 418, the play of either program A, program B or the interactive application accompanying program A can be automatically resumed and displayed on the screen for the viewer at the point where it was previously paused at 420.

Playback Options of Interactive Applications

[0072] Applications included in programming can pose a problem when the programs are recorded using, for example a PVR or other storage device. This is because some programs are designed to run only when originally broadcasted. In addition, systems may not be designed to handle special "trick" modes that are available during playback of recorded programming including applications.

[0073] FIG. 5 is a flow diagram showing how a recording system can handle a request for recording content that includes an application. As stated above, some applications do not allow for being run at any time other than their original broadcast time. Such applications should not therefore be recorded. Accordingly, the application's data may include an indicator as to whether the application is allowed to be recorded. If no such indicator exists, then even if someone requests that the application be recorded, it will not be. This indication can be included in the Carousel information 20 described above, or in other data in the stream. For

instance, if the program was being broadcast using MPEG standard transport, a descriptor in the PMT could be used to signal that recording is allowed.

[0074] In FIG. 5 a request to record content that includes an application is made at 500. Software on the recording system then checks to determine whether recording the application is allowed at 502. If recordation of the application is not allowed, the system will not record the application at 504. Alternatively, the system can determine whether recording the application should nonetheless be allowed. The system may still, however, record the programming content without the application. If recordation of the application is allowed, the system records the application at 506.

[0075] FIG. 6 is a flow diagram showing one method employed by the interactive television system described above for initiating playback of recorded applications. After the program is recorded on the recording device, playback of the program is initiated at 600. The receiver is configured to detect applications in the recorded data at 602. When an application is detected in the program, the application is launched at 604. The manner in which applications are detected in the program depends upon how the program was stored.

[0076] FIG. 7 is a flow diagram illustrating the detection of an application in a system configured to receive a program as a data stream is shown. If the application was recorded as a data stream, the receiver detects an application by examining the sequential stream of data which is played back from the recording device at 702. When the stream contains information indicating that the application is available, the receiver detects this information and thereby detects the application at 704. If the application is available it is launched at 706.

[0077] Whether the program was stored as a data stream or as a set of files, the detection of applications continues as the program is played back. Thus, as new applications are detected, they are launched. It should be noted that the capabilities of the receiver and the policies implemented in the execution environment of the receiver determine the effect on a

currently executing application of launching another application. Preferably, as described above, programming and other applications are paused when a new application is launched. It may or may not be necessary to unload the first application from memory while the second application is executing. If the receiver can simultaneously execute more than one application, then the second application may be launched while the first application continues to run. The receiver may, however, implement a policy which prohibits executing applications simultaneously. The receiver may therefore be required to kill or suspend the first application upon launching the second, even though the receiver is capable of executing both.

[0078] As mentioned above, when a user plays back a program, he or she may wish to use special playback modes rather than simply playing the program back sequentially (i.e., in a normal play mode.) The special modes include trick play modes, such as fast-forward, slow motion and rewind, and may also include jump, seek and pause features. When special play modes are used, the program moves from a first point at which an application is in a first state (e.g., showing a particular graphic) to a second point at which the application should be in a second state (e.g., showing a different graphic.) Because the portion of the program between the first and second points is not played (or executed,) certain signals and events which would normally cause an application to modify its state are not encountered. Care must therefore be taken to ensure that the behavior of the application resulting from use of the special play mode corresponds to the position in the program after the special play mode is stopped. In many cases, the author of the application will implement the application such that it is resilient to some or all of the trick modes, while other trick modes may cause undesirable behavior if not signaled.

[0079] FIG. 8 is a diagram showing how playback of programs containing applications can be controlled. Television programs with associated interactive applications are stored on

the recording device 800 for playback at the viewer's convenience. System software 802 implements all the functions normally associated with this type of device, such as controlling drivers for peripheral devices and subsystems, as well as implementing the operating system. FIG. 8 illustrates three special sub-components, namely the playback driver 804 which controls the playback of the content, a registry 808 that maintains information about the capabilities of the application 806, and, an administrative component 810 that handles policy decisions for the system. The administrative component 810 can be implemented in several ways including as an application, as a 3rd party extension to the system, or built into the system itself. The application 806, in conjunction with the system software 802, registers its capabilities and rights.

[0080] The registered capabilities include what trick modes it is able to handle at the moment. This can be implemented as a static mechanism where the information is stored in the description of the application (in the Carousel information 20 described above, or in other data in the stream. For instance, if the program was being broadcast using MPEG standard transport, a descriptor in the PMT can be used to signal that recording is allowed.) In this case the capabilities are read by the system and registered accordingly. Alternatively (or in addition to the static mechanism), this can be a dynamic process where the application can, as it runs, change what trick modes it is prepared to handle by using an interface provided by the system to change the current capabilities. So it might never handle rewind, and only handle fast-forward through certain parts of the program. This dynamic change in behavior can be applied to all special playback modes available in the system.

[0081] The rights registered with the system include whether or not it has the right to handle requests from the viewer to perform trick modes. Generally the viewer will indicate that they want to fast-forward by pressing a "fast-forward" key on their remote (although other mechanisms are possible). The signal that the viewer pressed that key could be

processed in two ways -- either the system handles it, invoking the trick mode accordingly, or the signaled key press can be passed on to the application to let the application do what it wants with it (which may not be to fast-forward the recorded program). The former provides consistency of behavior, while the latter give the application the ability to enhance the behavior of the system. Since many broadcasters have a strong interest in consistency, they may want to maintain control of what applications process trick mode requests, so the ability to process such signals is a right that is granted to applications.

[0082] The registration of this right with the system can be implemented in several ways. It can be described in the Carousel information 20 described above. See US Patent 5,625,693, "Apparatus and method for authenticating transmitting applications in an interactive TV system," incorporated here in its entirety by reference for all it teaches, for a description of defining applications permissions in a signed application directory.

Alternatively, the application can register a credential that authorizes the application. See US Patent 6,148,081, "Security model for interactive television applications," incorporated here in its entirety by reference for all it teaches, for a description of using credentials to establish rights. Alternatively, the rights could resident in memory on the STB. For example, they could be distributed by the Conditional Access System normally used to control access to Premium pay services such as HBO or Pay-per-view movies. Furthermore, if an application has the right to handle these signals, it still may not desire to handle them all the time, so an additional step may be employed where an authorized application makes a request to the system to send trick mode requests signals to the application, and can later request that the system resume handling those signals itself.

[0083] FIG. 8 shows the playback driver 804 in communication with the application 806, again in conjunction with the system software 802. At fixed intervals or at instances of state changes, and at other times of its choosing, the driver 804 will send a message to the

application 806 concerning its current state. Illustrative messages might be, for example, "Normal Play", "Fast-forward", "Fast-forward 10x", "Stopped", etc.

[0084] The administrative component 810 may also override the capabilities of the application 806 based on its own criteria. For example, some features may be disabled at different times, such as, the application 806 may register that it is fast-forward capable, but the administration 810 may register that it wants the playback driver 804 to disallow that feature for some reason.

[0085] Figure 9 is a flow diagram illustrating how playback of applications are handled. First, playback is initiated at 900 and an application is launched at 902. After playback is initiated, a starting set of capabilities of the application are registered at 904. Execution of the application then begins. During its continued execution at 906, the application will receive, via any of several methods (interrupt, polling, shared memory, etc.), messages from the playback driver concerning its state. The actions taken by the application will vary depending on the effect desired by the author. For example, some applications may choose to remove all graphical overlays from the screen during a Fast-forward Operation, and may not redisplay overlay elements after Normalplay resumes and new data is acquired from the stream. Alternatively, a different type of application may be designed predominately for use during Trickplay during which most "normal" applications cannot provide meaningful applications. For example, consider a Fast-forward book-marking application, where in the user watches a TV program during Fast-forward, hitting select when the fast-forward video content is "interesting." Information sent to the application by the PlayBack Driver, concerning the speed of playback, the position of the PlayBack Index, etc. could be used to build a bookmark list, possibly in conjunction with other MetaData in order to rapidly move from marked scene to marked scene. For example, previewing an entire football game in FastMotion, marking the proximate positions of all long pass plays is possible. When

combined with MetaData of the precise times when plays begin and end, an application could prepare a playlist of the long-pass plays.

[0086] It should be pointed out that some applications may depend on live data reception to maintain their state. When a special playback mode is used to cause an application to move to a particular point in the playback of the program, precautions may be taken to ensure that the application is in the appropriate state after the program returns to a normal playback mode. This can be addressed for two different cases: cases in which applications were authored with the intent that they would be recorded and played back; and cases in which applications were not intended to be recorded and replayed.

[0087] In the first case, an application is produced with the knowledge that it maybe recorded and played back using special play modes. Such an application is designed to accept notifications of these special play modes and to accommodate them. For example, an application can be configured to generate a query to determine the current position in the playback of the program. The application could then set its internal state according to the position in the program. In the second case, an application is produced with the intent that it should be consumed as it is received. The application is not designed to jump from one position to another in the program except as the program progresses in a normal play mode. In either case, a request for a trick mode not currently handled by the application may occur.

[0088] FIG. 10 is a diagram illustrating how the first case is handled. First, the viewer requests a trick mode at 1000. The system then determines if the application has the right to handle trick mode request signals (key presses) and if it has requested them at 1002. If so, the signal is sent to the application at 1004, and it is up to the application to handle the situation. If the system is handling the trick mode signals, it determines if the application can currently handle the specific trick mode requested at 1006. If it can, the request is processed normally at 1008. If the application has registered that it cannot currently handle the trick

made, then the administrative component is informed of the decision and is allowed to take appropriate action at 1010. Options 1012 for the administrative component include (but are not limited to): killing the application and letting the trick mode occur, allowing the application to run and ignoring the trick mode request, and letting the trick mode occur but allowing the application to continue to run. If the administrative component does kill the application it further has the option to restart the application once the trick mode is exited.

[0089] The application may be allowed to save information (e.g., state information) to persistent storage such as the recording device when it is terminated. It should be noted that the application may be removed from memory when it is terminated, so it may have to be downloaded again from the data stream and restarted after the program has jumped to the new position.

Recording Variable Rate Streams

Programming streams can be transmitted at variable rates depending upon the available bandwidth. When viewing the programming as it is broadcasted this does not become a problem because the system can play back the streams at a constant frame rate. However, when the streams are recorded before playback on a PVR or other recording devices, the variable rate of the streams can pose problems during playback. Specifically, playback on PVRs often uses trick modes that allow a user to skip ahead or back in the broadcast a predetermined amount or play the streams in fast-forward or reverse. To use trick modes with variable rate content metadata that indicates a correspondence between play-time and location of the data on the recording media is typically required.

[0090] This metadata can be generated in a variety of manners as described below with reference to Figs. 11-13.

[0091] FIG. 11 illustrates a first process for determining the time and offset relationship for a variably dripped stream. The system shown in FIG. 11 includes transmission equipment

1100 and receiving equipment 1102. For the example shown in FIG. 11, three streams of data (A,B,C) are being dripped to a population of PVR's over a broadcast network. The Table of T's and O's is dripped to receivers along with each video program. FIG. 11 depicts a case where the Table 1104 is sent in its entirety prior to trickling the videos. However, it should be understood that the Table 1104 could be dripped slowly as well. Furthermore, for simplicity, FIG. 11 shows a single table 1104 for all three streams; however, the Table 1104 could have several T,O pairs, one for each stream, or multiple Tables could be sent. The Table is prepared by the Analysis Engine 1106, which calculates indices at the server side that provide a correspondence between normal play time and depth (e.g., in bytes) into either the individual streams (video, audio, etc.) or into a mixed transport/program stream that is going to be dripped. In addition to time and offset calculations, the table may also include other information about the programming content. For example, the table may also include the parental rating of the content. The system could then block recording and/or playback of data that the viewer is not authorized to view. Note that the stream is generally dripped with the express purpose of being recorded for later use, so the broadcaster knows for which streams they want to calculate this information. This correspondence (e.g., the tables) is broadcast as meta-data along with the transport/program stream. It is also possible to send the tables separately through a return channel. Preferably, the tables are broadcast by sending the information first or sending it last, by "dripping" the table information by multiplexing it with the three streams of data at 1108.

[0092] On the set-top box at the receiver side, the dripped a/v/d/md (streamed data) 1110 is received, demultiplexed 1112, and recorded on a storage device 1114. At this time, a correspondence between depth into respective individual streams, or a mixed transport/program stream and location on the recording media is maintained. The broadcast correspondence between playtime and depth 1116 is also recorded on the recording media.

Note that the recorded mixed transport/program stream need not be identical to the original broadcast one. It is also noted that the data need not be stored on the recording media contiguously, e.g., something similar to (paged, segmented) virtual memory tables could be used. When trick modes, e.g., fast-forward, rewind, etc., are requested, the normal playtime to which to jump is determined. Thereafter, the depth is looked up, and using the depth, the location is determined and the content is fetched. In an alternative embodiment, the receiver could also pull the Table information from an on-line server over a 2-way communications link (not shown). It should be noted that the Table could be in a different format than described above. For example, a hash structure could be used, as well as other known data structures.

[0093] FIG. 12 illustrates a second process for determining the time and offset relationship for a variably dripped stream. The structure is the same as in the embodiment shown in FIG. 11. In this embodiment, however, the Analysis Engine 1106 is replaced by a Playback Timestamp Engine 1200. This component creates a timestamp packet that is multiplexed and dripped along with the video programs 1202, and the data within the packet is used to create the T,O pairs at the receiver side at 1204. If interactive applications are included with the video programs in the broadcast streams, preferably, the interactive applications are also time stamped.

[0094] The embodiment illustrated in FIG. 12 includes broadcasting intermixed within the program data (the individual streams or mixed transport/program stream), and time stamp information that indicates the normal play time of the data it is being mixed with. Two alternative methods of performing this method include a) ensuring that one of the individual streams includes program clock reference (PCR) information in its packets, or b) including an additional stream (a separate packet id (PID) when using MPEG transport) into a program designated to maintain the normal play time. In the latter case, that stream is multiplexed

into the other streams frequently enough to ensure a quality mapping of the correspondence between normal play time and offset into the other stream data, but not so frequently that the overhead of collecting the information is problematic. For example, on MPEG based streams, it is necessary to ensure that packets that include the time base occur frequently in the mix.

[0095] On the set-top box, as the dripped a/v/d/md is received and recorded, whenever content is detected that includes time base information, an entry is added to the mapping from normal play time and offset into the stream data as it is saved. If the separate stream approach is used with MPEG transport, there is usually hardware that is able to filter on the PID of the time base stream and assist in collecting the data.

[0096] When trick modes are requested, the normal playtime in which to jump is determined by the system. Thereafter, the depth is looked up, and using the depth, the location is looked up and the content is fetched.

[0097] FIG. 13 illustrates a third process for determining the time and offset relationship for a variably dripped stream. The structure of this embodiment is similar to the embodiments in Figs. 11 and 12. In this embodiment, the algorithms run at the encoder can also be run at the receiver, directly or an equivalent thereto. In the third embodiment, the PVR stores the dripped program, and subsequently performs an analysis phase to build the Table. One way to perform this function is as follows. The dripped program is recorded. When the set-top box (note: as always, the set top box components and functionality could be built into the television or other consumer electronic (CE) device) is not busy, it could "play" A/V at the normal rate (though not display on the television) for purposes of calculating the correspondence between normal play time and location on the recording media to build a table 1300. Then, the correspondence could be used for trick modes. Other methods of building the table at the receiver side could also be implemented.

[0098] In alternative embodiments of the invention, if the stream is missed during recording because the viewer switched channels briefly or due to broadcast errors, the missing part could be requested later over a return channel or could be obtained from a scheduled re-broadcast, when the television was off, for example.

[0099] In still further alternative embodiments, the receiver could play back (during "off times") the video at normal speed while not presenting it on the display. In this way, the correspondences are computed using special purpose hardware to mark certain time increments in the video, for example. This may overcome the disadvantage of having to play back (at least a portion of) the video before trick mode becomes usable.

[00100] The many features and advantages of the invention are apparent from the detailed specification and, thus, it is intended by the appended claims to cover all such features and advantages of the invention that fall within the true spirit and scope of the invention. Further, since numerous modifications and changes will readily occur to those skilled in the art, it is not desired to limit the invention to the exact construction and operation illustrated and described, and accordingly all suitable modifications and equivalents may be resorted to, falling within the scope of the invention.

What is claimed is:

1. A method for controlling playback of recorded programming and an application comprising:
 - playing a recorded program comprising an application;
 - playing the application;
 - receiving a viewer command indicating that a viewer desires to use a trick mode,
 - determining whether the trick mode is compatible with the application, and
 - playing the application in the desired trick mode if the trick mode is compatible with the application.
2. The method of claim 1, wherein the trick mode is selected from the group consisting of fast-forward, slow motion, rewind, jump, seek and pause.
3. The method of claim 1, wherein the recorded program is stored on a Personal Video Recorder (PVR) or network PVR.
4. The method of claim 1, wherein the application is an interactive application.
5. The method of claim 1, wherein the application comprises an indicator that indicates whether the application can be recorded.
6. The method of claim 1, wherein the application registers which trick modes are compatible with the application.
7. The method of claim 6, wherein the application changes the trick modes that are compatible as the application is played.
8. The method of claim 1, wherein if the trick mode is not compatible an action selected from the group consisting of stepping the application, initiating the trick mode, ignoring the viewer command.
9. A method for controlling playback of recorded programming and an application comprising:

playing a recorded program comprising an application;
registering the capabilities of the application, wherein the capabilities comprise which
trick modes can be used with the application; and
playing the application.

10. The method of claim 9, wherein the application changes the trick modes that are
compatible as the application is played.

11. The method of claim 9, wherein the trick mode is selected from the group
consisting of fast-forward, slow motion, rewind, jump, seek and pause.

12. The method of claim 9, wherein the recorded program is stored on a Personal
Video Recorder (PVR) or network PVR.

13. The method of claim 9, wherein the application is an interactive application.

14. The method of claim 9, wherein the application comprises an indicator that
indicates whether the application can be recorded.

15. A system for playing recorded programming and an application comprising:
a playback driver layer capable of playing programming comprising an application;
a registry layer that indicates which trick modes should be available for an
application; and

an administrative component layer that determines what action to take when a trick
mode that is registered as not being available is requested.

◆

16. The system of claim 15, wherein the trick mode is selected from the group
consisting of fast-forward, slow motion, rewind, jump, seek and pause.

17. The system of claim 15 further comprising a recording device.
18. The system of claim 15, wherein the recording device is a Personal Video Recorder (PVR) or network PVR.
19. The system of claim 15, wherein the application is an interactive application.
20. The system of claim 15, wherein the administrative component layer determines an action selected from the group consisting of stopping the application, initiating the trick mode, ignoring the request.
21. A method for controlling playback of recorded programming and an application comprising:
- playing a recorded program comprising an application;
 - registering the rights of the application, wherein the rights comprise which trick modes the application is allowed to perform; and
 - playing the application.
21. A method for recording programming and an application comprising:
- recording a program comprising an application;
 - determining whether the application can be recorded; and
 - recording the program and application if the application can be recorded.
22. The method of claim 21, wherein the application indicates whether it can be recorded.
23. The method of claim 22, further comprising determining what action to take if the application indicates that it can not be recorded.

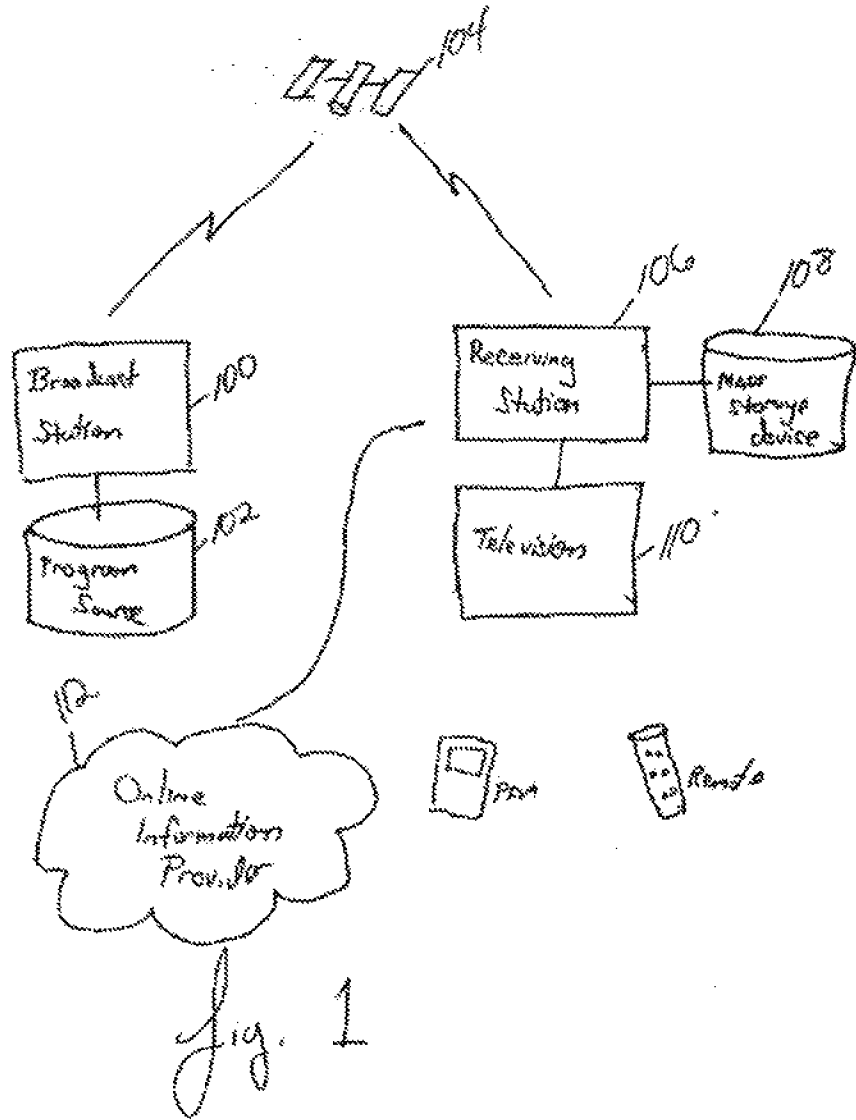


Fig. 1

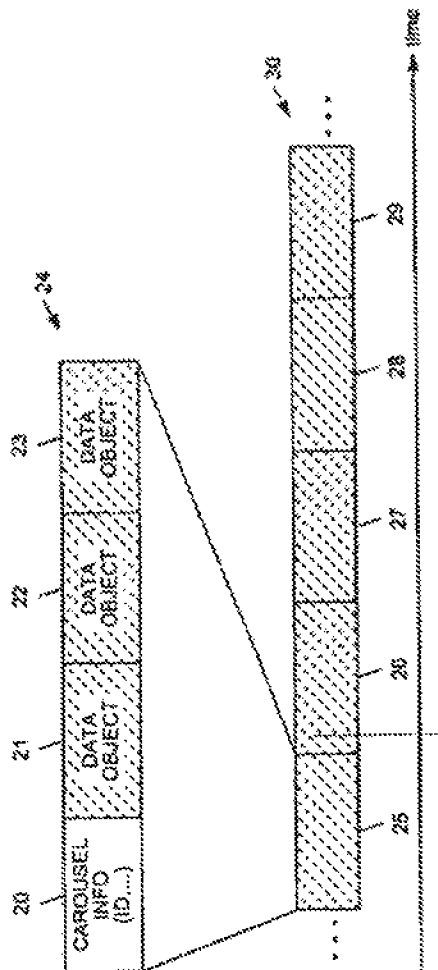


Fig. 2

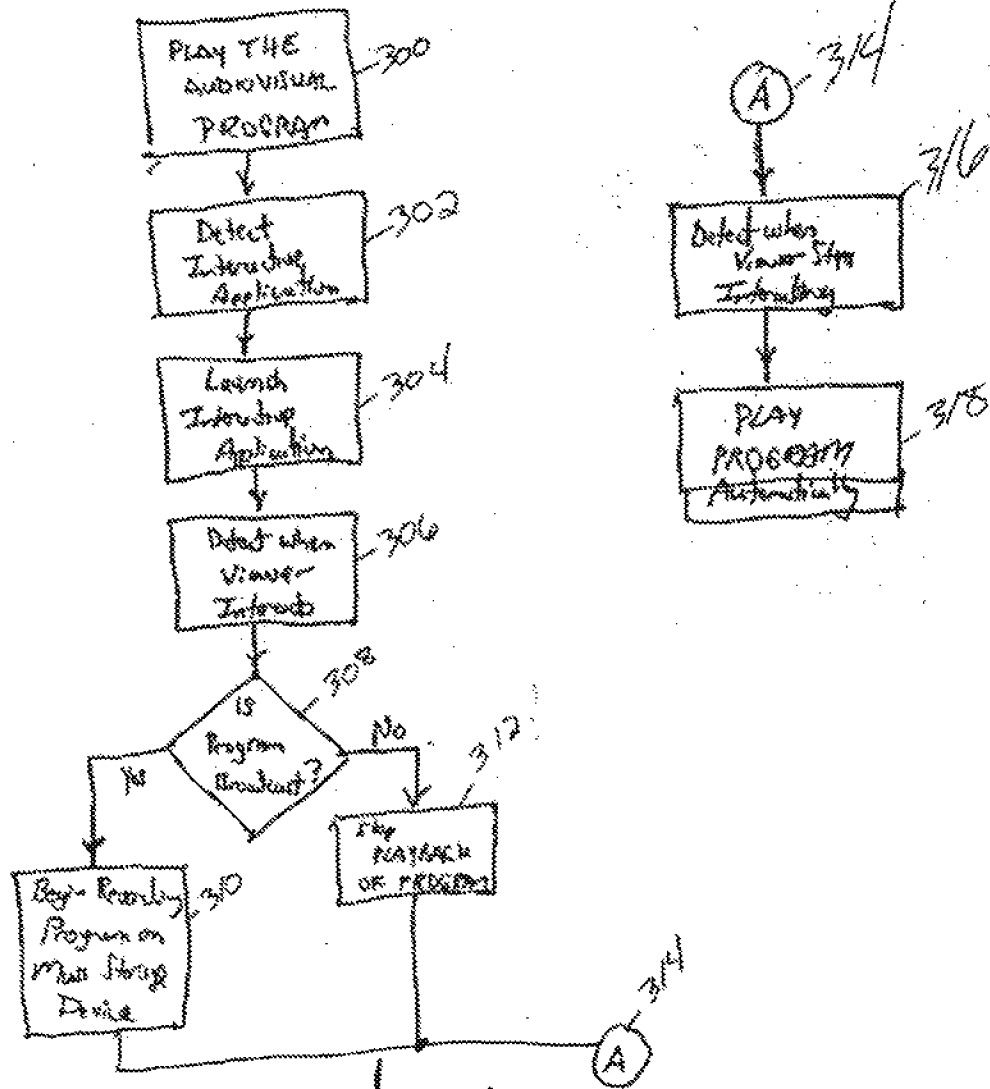
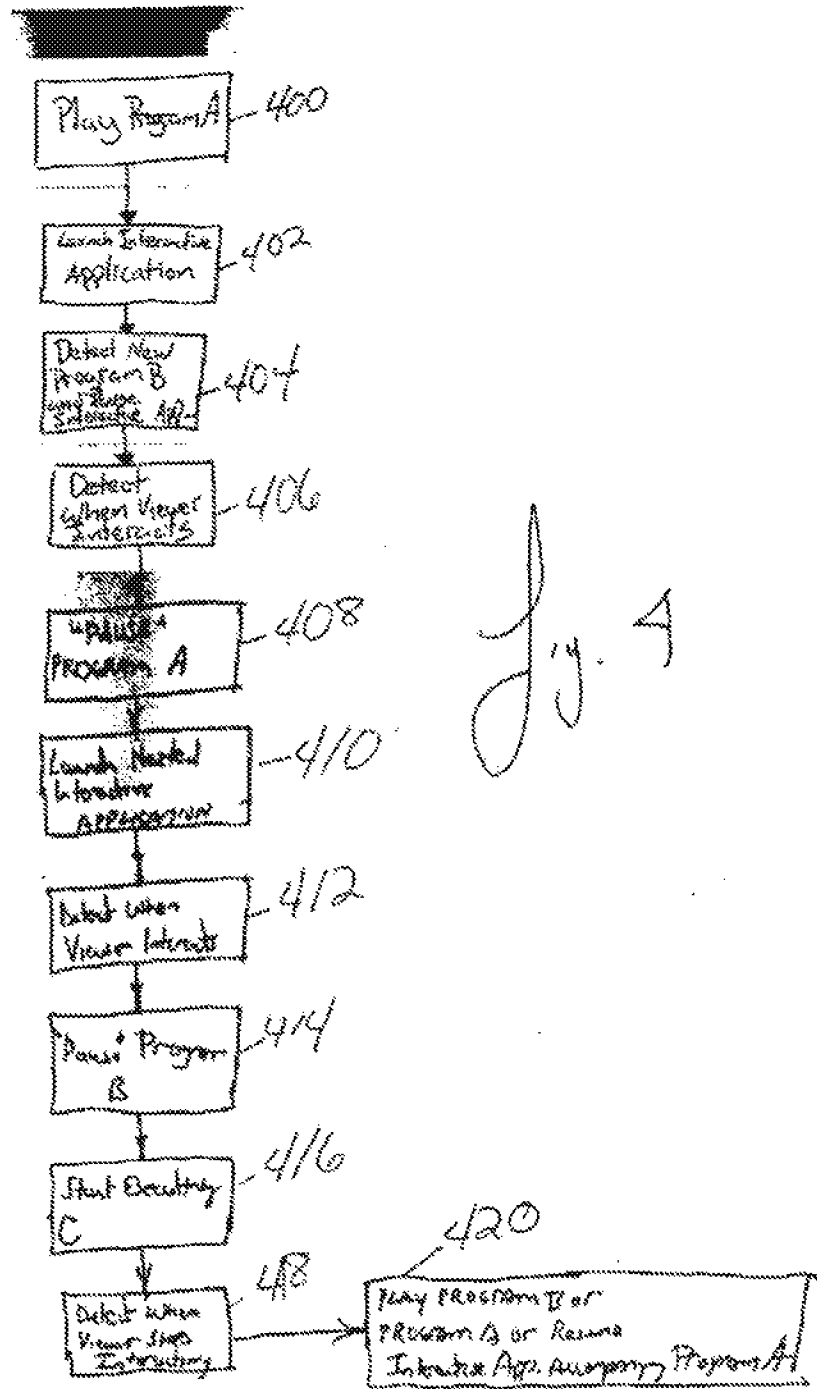


Fig. 3



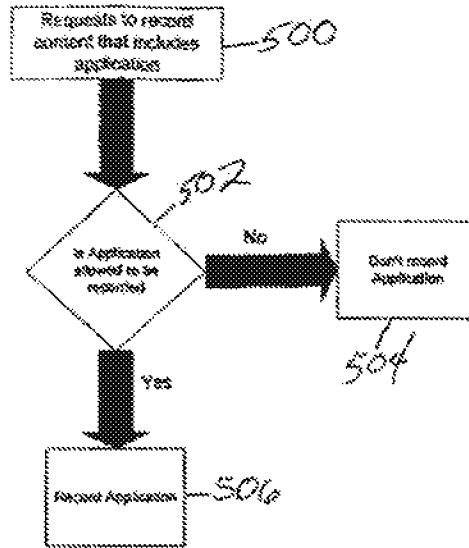


Fig. 5

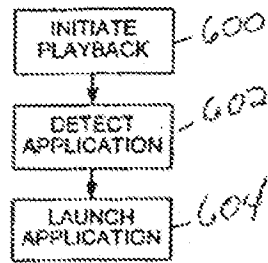


Fig 6

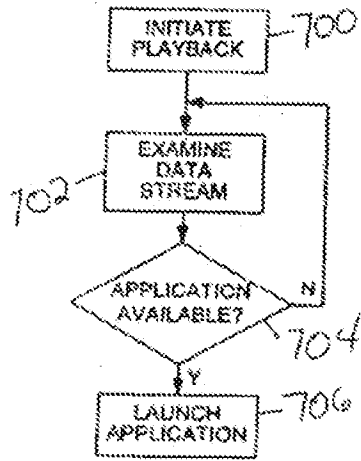


Fig-7

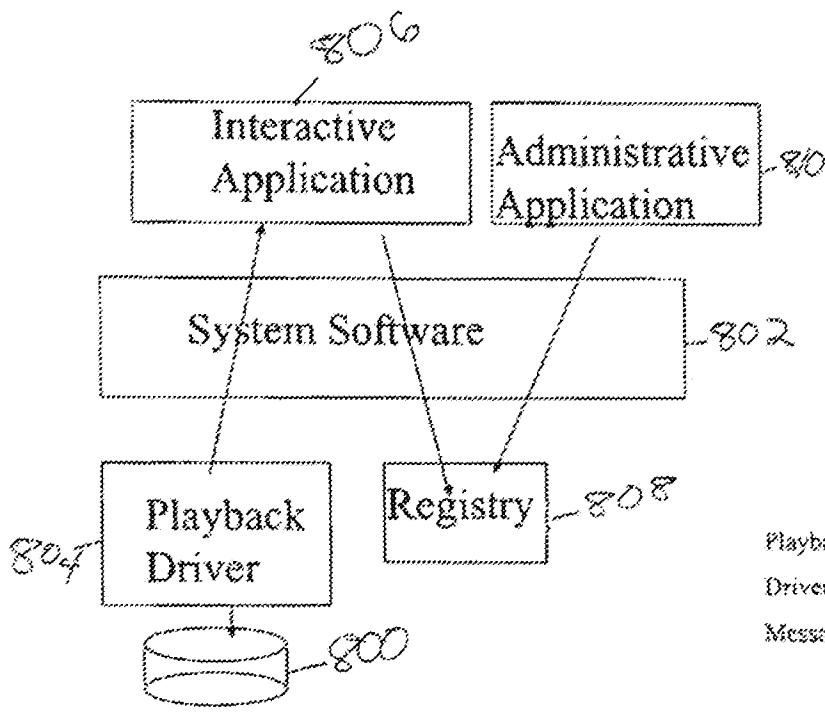


Fig. 8

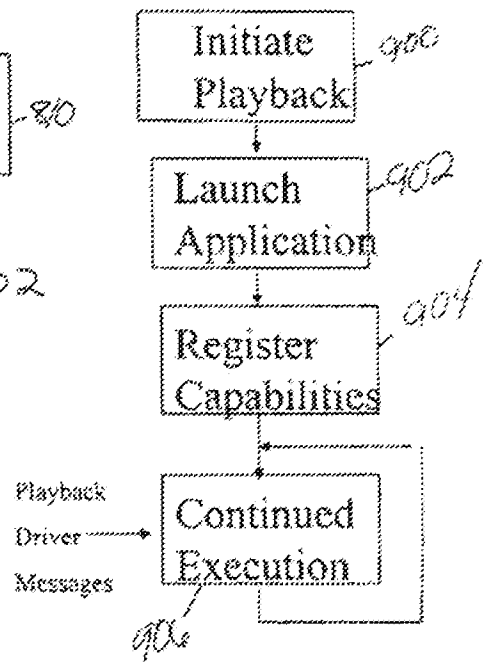


Fig. 9

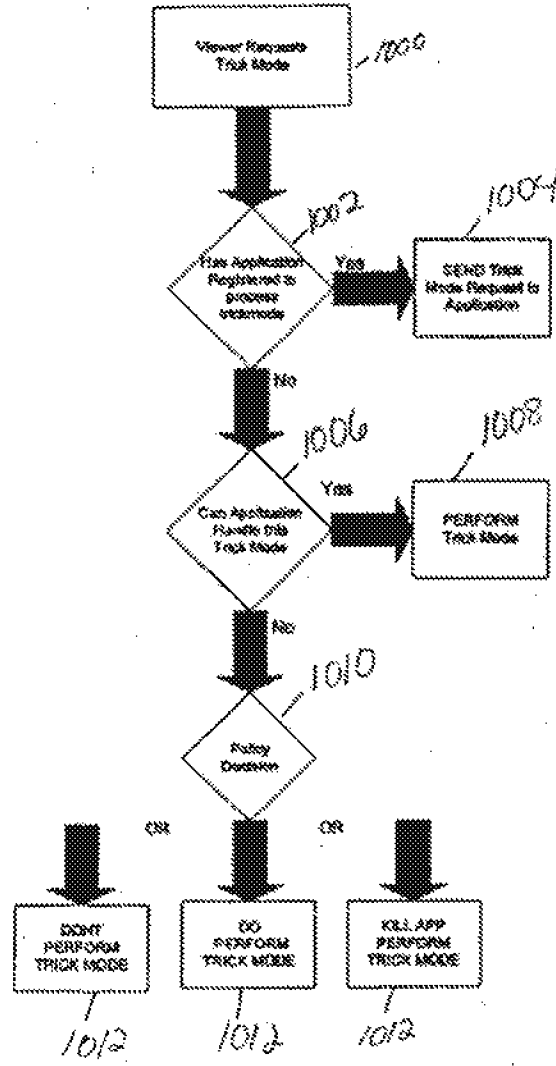
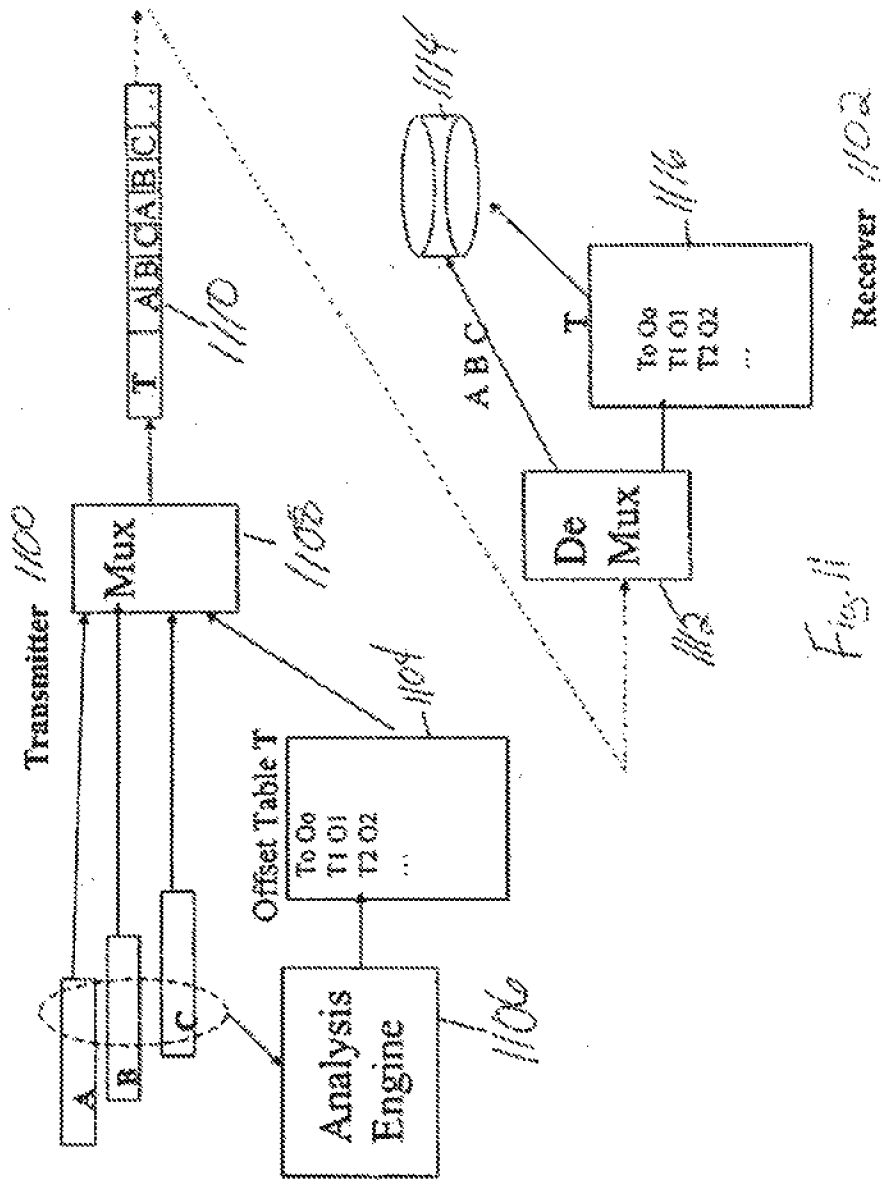


Fig. 10



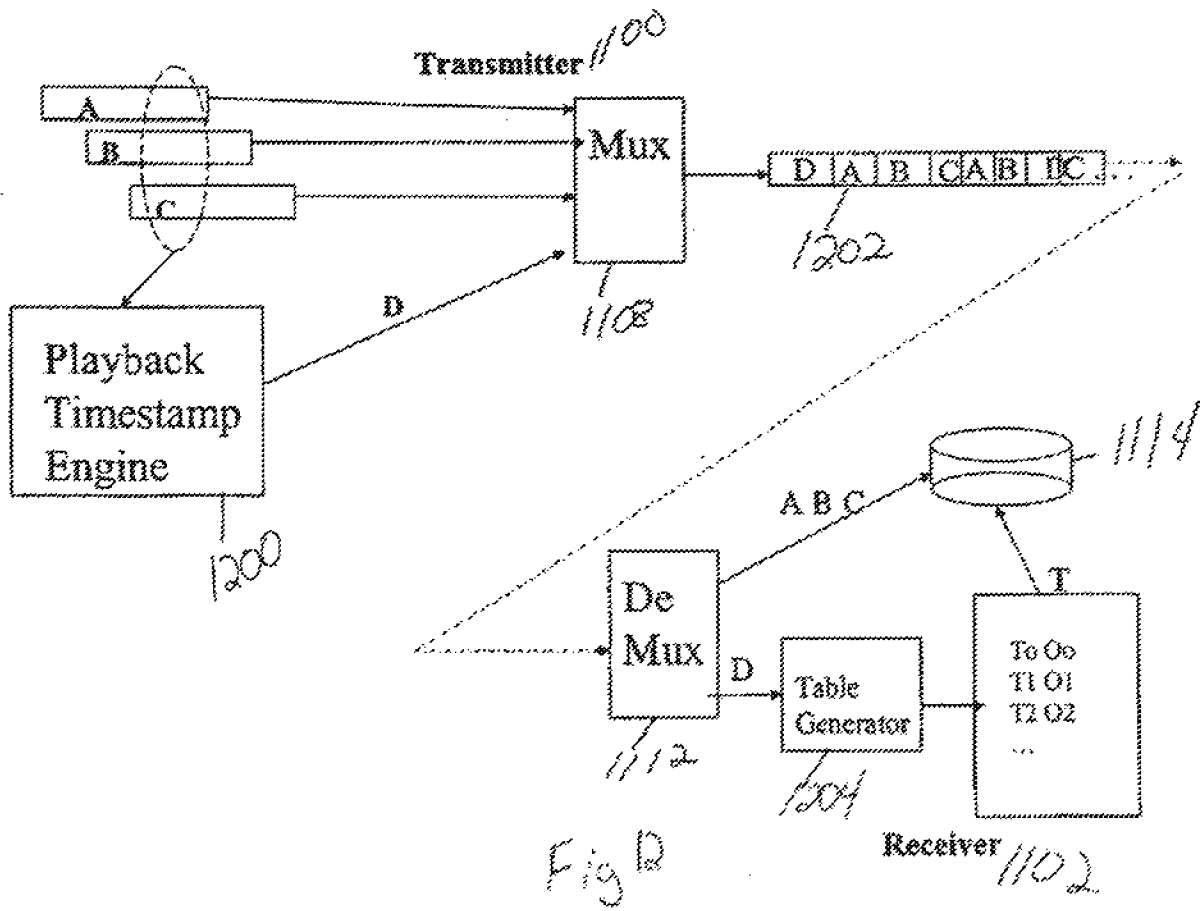
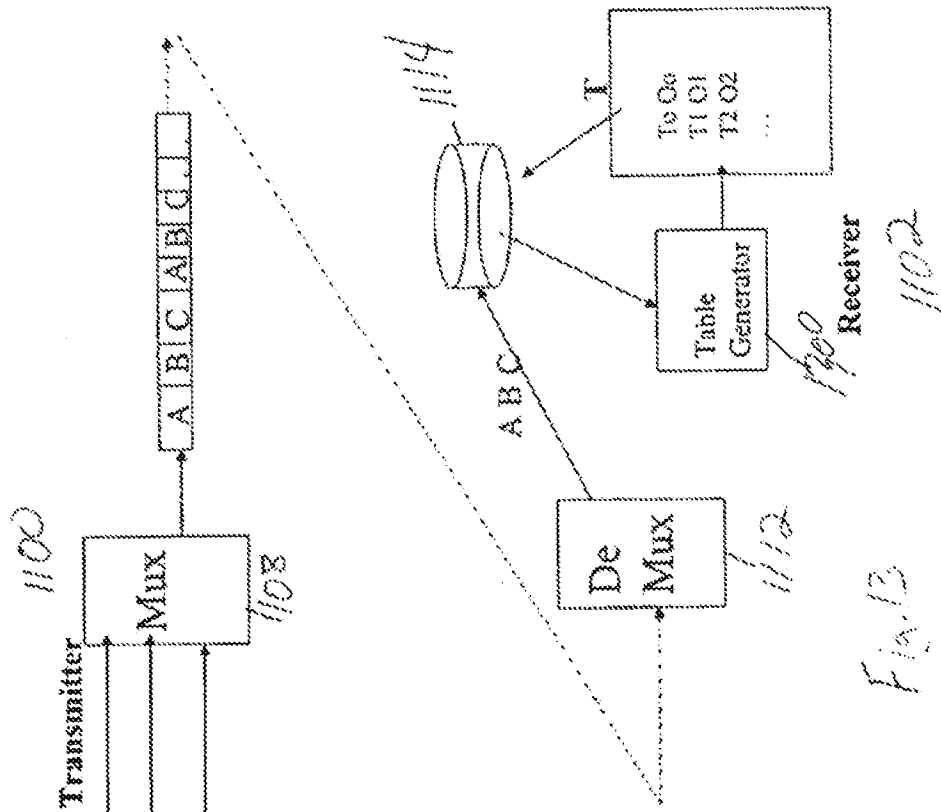


Fig D



Electronic Acknowledgement Receipt

EFS ID:	7860394
Application Number:	11469195
International Application Number:	
Confirmation Number:	6118
Title of Invention:	SYSTEMS AND METHODS TO MODIFY PLAYOUT OR PLAYBACK
First Named Inventor/Applicant Name:	Esteban Sardera
Customer Number:	44367
Filer:	Gregory W. Smock/Patrick McNally
Filer Authorized By:	Gregory W. Smock
Attorney Docket Number:	2050.053US1
Receipt Date:	21-JUN-2010
Filing Date:	31-AUG-2006
Time Stamp:	19:42:52
Application Type:	Utility under 35 USC 111(a)

Payment information:

Submitted with Payment	no
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File Listing:

Document Number	Document Description	File Name	File Size(Bytes)/ Message Digest	Multi Part /.zip	Pages (if appl.)
1		11469195_SIDS_06-21-10.pdf	72986 <small>39457d9496706c5d39e732513e4d4cc81d3765d3</small>	yes	4

Multipart Description/PDF files in .zip description					
Document Description			Start	End	
Miscellaneous Incoming Letter			1	1	
Transmittal Letter			2	3	
Information Disclosure Statement (IDS) Filed (SB/08)			4	4	
Warnings:					
Information:					
2	Foreign Reference	001_ep01553598a2.pdf	480852	no	12
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Warnings:					
Information:					
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Information:					
5	NPL Documents	004_fx.pdf	24597	no	1
			0b9ef962670dc555db11f20a417fb051be20d4a2a		
Warnings:					
Information:					
Total Files Size (in bytes):			7373390		

This Acknowledgement Receipt evidences receipt on the noted date by the USPTO of the indicated documents, characterized by the applicant, and including page counts, where applicable. It serves as evidence of receipt similar to a Post Card, as described in MPEP 503.

New Applications Under 35 U.S.C. 111

If a new application is being filed and the application includes the necessary components for a filing date (see 37 CFR 1.53(b)-(d) and MPEP 506), a Filing Receipt (37 CFR 1.54) will be issued in due course and the date shown on this Acknowledgement Receipt will establish the filing date of the application.

National Stage of an International Application under 35 U.S.C. 371

If a timely submission to enter the national stage of an international application is compliant with the conditions of 35 U.S.C. 371 and other applicable requirements a Form PCT/DO/EO/903 indicating acceptance of the application as a national stage submission under 35 U.S.C. 371 will be issued in addition to the Filing Receipt, in due course.

New International Application Filed with the USPTO as a Receiving Office

If a new international application is being filed and the international application includes the necessary components for an international filing date (see PCT Article 11 and MPEP 1810), a Notification of the International Application Number and of the International Filing Date (Form PCT/RO/105) will be issued in due course, subject to prescriptions concerning national security, and the date shown on this Acknowledgement Receipt will establish the international filing date of the application.

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Applicant: Esteban Sardera

Title: SYSTEMS AND METHODS TO MODIFY PAYOUT OR PLAYBACK

Docket No.: 2050.053US1
Filed: August 31, 2006
Examiner: Unknown
Customer No.: 44367

Serial No.: 11/469,195
Due Date: N/A
Group Art Unit: 3763
Confirmation No.: 6118

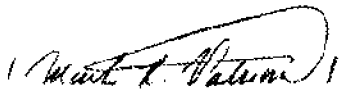
Mail Stop Amendment
Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

We are transmitting herewith the following attached items (as indicated with an "X"):

Information Disclosure Statement (2 pgs.), Form 1449 (1 pg.) Copies of Cited References (4).

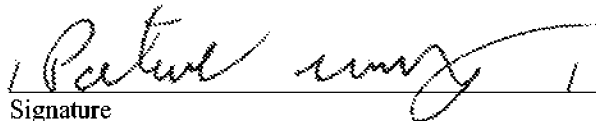
If not provided for in a separate paper filed herewith, please consider this a PETITION FOR EXTENSION OF TIME for sufficient number of months to enter these papers and please charge any additional fees or credit overpayment to Deposit Account No. 19-0743.

SCHWEGMAN, LUNDBERG & WOESSNER, P.A.
Customer No.: 44367

By: 
Mark R. Vatuone
Reg. No. 53,719

CERTIFICATE UNDER 37 CFR 1.8: The undersigned hereby certifies that this correspondence is being filed using the USPTO's electronic filing system EFS-Web, and is addressed to: Mail Stop Amendment Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450 on this 21st day of June, 2010.

Patrick McNally
Name


Signature

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Applicant:	Esteban Sardera	Examiner:	Unknown
Serial No.:	11/469,195	Group Art Unit:	3763
Filed:	August 31, 2006	Docket:	2050.053US1
Customer No.:	44367	Confirmation No.:	6118
Title:	SYSTEMS AND METHODS TO MODIFY PAYOUT OR PLAYBACK		

INFORMATION DISCLOSURE STATEMENT

MS Amendment
Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

In compliance with the duty imposed by 37 C.F.R. § 1.56, and in accordance with 37 C.F.R. §§ 1.97 *et. seq.*, the enclosed materials are brought to the attention of the Examiner for consideration in connection with the above-identified patent application. Applicant respectfully requests that this Information Disclosure Statement be entered and the documents listed on the attached PTO 1449 Form be considered by the Examiner and made of record. Pursuant to the provisions of MPEP 609, Applicant requests that a copy of the PTO 1449 Form, initialed as being considered by the Examiner, be returned to the Applicant with the next official communication.

Pursuant to 37 C.F.R. § 1.97(b), it is believed that no fee or statement is required with the Information Disclosure Statement. However, if an Office Action on the merits has been mailed, the Commissioner is hereby authorized to charge the required fees to Deposit Account No. 19-0743 in order to have this Information Disclosure Statement considered.

Pursuant to 37 C.F.R. § 1.98(a)(2), copies of cited U.S. Patents and Published Applications, and Non-Published Applications identifiable by USPTO Serial Number, are no longer required to be provided to the Office. Applicant acknowledges the requirement to submit copies of foreign patent documents and non-patent literature in accordance with 37 C.F.R § 1.98(a)(2).

INFORMATION DISCLOSURE STATEMENT

Serial Number: 11/469,195

Filing Date: August 31, 2006

Title: SYSTEMS AND METHODS TO MODIFY PLAYOUT OR PLAYBACK

Page 2

Dkt: 2050.053US1

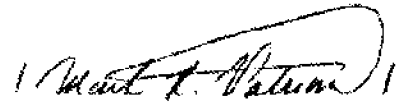
The Examiner is invited to contact the undersigned at the telephone number indicated if there are any questions regarding this communication.

Respectfully submitted,

SCHWEGMAN, LUNDBERG & WOESSNER, P.A.
P.O. Box 2938
Minneapolis, MN 55402
(408) 278-4046

Date June 21st, 2010

By



Mark R. Vatuone

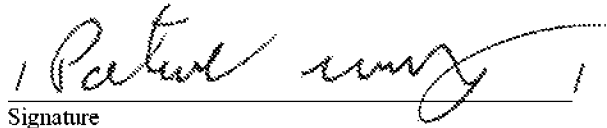
Reg. No. 53,719

MRV:pjm

CERTIFICATE UNDER 37 CFR 1.8: The undersigned hereby certifies that this correspondence is being filed using the USPTO's electronic filing system EFS-Web, and is addressed to: MS Amendment, Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450 on this 21st day of June, 2010.

Patrick McNally

Name



Signature



UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

Table with 5 columns: APPLICATION NO., FILING DATE, FIRST NAMED INVENTOR, ATTORNEY DOCKET NO., CONFIRMATION NO.

11/469,195 08/31/2006 Esteban Sardera 2050.053US1 6118

44367 7590 12/17/2010
SCHWEGMAN, LUNDBERG & WOESSNER/OPEN TV
P.O. BOX 2938
MINNEAPOLIS, MN 55402-0938

Table with 1 column: EXAMINER

SHIBRU, HELEN

Table with 2 columns: ART UNIT, PAPER NUMBER

2484

Table with 2 columns: NOTIFICATION DATE, DELIVERY MODE

12/17/2010 ELECTRONIC

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Notice of the Office communication was sent electronically on above-indicated "Notification Date" to the following e-mail address(es):

uspto@slwip.com
request@slwip.com

Office Action Summary

Application No. 11/469,195	Applicant(s) SARDERA, ESTEBAN	
Examiner HELEN SHIBRU	Art Unit 2484	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 1 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) Responsive to communication(s) filed on 31 August 2006.
- 2a) This action is **FINAL**. 2b) This action is non-final.
- 3) Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) Claim(s) 1-88 is/are pending in the application.
4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) Claim(s) _____ is/are allowed.
- 6) Claim(s) _____ is/are rejected.
- 7) Claim(s) _____ is/are objected to.
- 8) Claim(s) 1-88 are subject to restriction and/or election requirement.

Application Papers

- 9) The specification is objected to by the Examiner.
- 10) The drawing(s) filed on _____ is/are: a) accepted or b) objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
a) All b) Some * c) None of:
1. Certified copies of the priority documents have been received.
2. Certified copies of the priority documents have been received in Application No. _____.
3. Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) Notice of References Cited (PTO-892)
- 2) Notice of Draftperson's Patent Drawing Review (PTO-948)
- 3) Information Disclosure Statement(s) (PTO/SB/08)
Paper No(s)/Mail Date _____.
- 4) Interview Summary (PTO-413)
Paper No(s)/Mail Date _____.
- 5) Notice of Informal Patent Application
- 6) Other: _____.

DETAILED ACTION

Election/Restrictions

1. This application contains claims directed to the following patentably distinct species,

Species 1: Figure 1

Species 2: Figure 9

Species 3: Figure 12

Species 4: Figure 15

2. The species are independent or distinct because claims to the different species recite the mutually exclusive characteristics of such species. In addition, these species are not obvious variants of each other based on the current record.

Applicant is required under 35 U.S.C. 121 to elect a single disclosed species, or a single grouping of patentably indistinct species, for prosecution on the merits to which the claims shall be restricted if no generic claim is finally held to be allowable. Currently, none of the claims appears to be generic.

There is a search and/or examination burden for the patentably distinct species as set forth above because at least the following reason(s) apply:

There is an examination and search burden for these patentably distinct species due to their mutually exclusive characteristics. The species require a different field of search (e.g., searching different classes/subclasses or electronic resources, or employing different search queries); and/or the prior art applicable to one species would

Art Unit: 2484

not likely be applicable to another species; and/or the species are likely to raise different non-prior art issues under 35 U.S.C. 101 and/or 35 U.S.C. 112, first paragraph.

Applicant is advised that the reply to this requirement to be complete must include (i) an election of a species or a grouping of patentably indistinct species to be examined even though the requirement may be traversed (37 CFR 1.143) and (ii) identification of the claims encompassing the elected species or grouping of patentably indistinct species, including any claims subsequently added. An argument that a claim is allowable or that all claims are generic is considered nonresponsive unless accompanied by an election.

The election may be made with or without traverse. To preserve a right to petition, the election must be made with traverse. If the reply does not distinctly and specifically point out supposed errors in the election of species requirement, the election shall be treated as an election without traverse. Traversal must be presented at the time of election in order to be considered timely. Failure to timely traverse the requirement will result in the loss of right to petition under 37 CFR 1.144. If claims are added after the election, applicant must indicate which of these claims are readable on the elected species or grouping of patentably indistinct species.

Should applicant traverse on the ground that the species, or groupings of patentably indistinct species from which election is required, are not patentably distinct, applicant should submit evidence or identify such evidence now of record showing them to be obvious variants or clearly admit on the record that this is the case. In either instance, if the examiner finds one of the species unpatentable over the prior art, the

evidence or admission may be used in a rejection under 35 U.S.C. 103(a) of the other species.

Upon the allowance of a generic claim, applicant will be entitled to consideration of claims to additional species which depend from or otherwise require all the limitations of an allowable generic claim as provided by 37 CFR 1.141.

Conclusion

3. Any inquiry concerning this communication or earlier communications from the examiner should be directed to HELEN SHIBRU whose telephone number is (571)272-7329. The examiner can normally be reached on M-F, 8:30AM-5PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, THAI Q. TRAN can be reached on (571) 272-7382. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

Application/Control Number: 11/469,195
Art Unit: 2484

Page 5

/HELEN SHIBRU/
Examiner, Art Unit 2621
December 8, 2010

S/N 11/469,195

PATENT

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Applicant:	Esteban Sardera	Examiner:	Helen Shibru
Serial No.:	11/469,195	Group Art Unit:	2484
Filed:	August 31, 2006	Docket:	2050.053US1
Customer No.:	44367	Confirmation No.:	6118
Title:	SYSTEMS AND METHODS TO MODIFY PLAYOUT OR PLAYBACK		

RESPONSE TO RESTRICTION REQUIREMENT

MS Amendment
Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

In response to the Restriction Requirement mailed December 17, 2010, Applicant submits the following.