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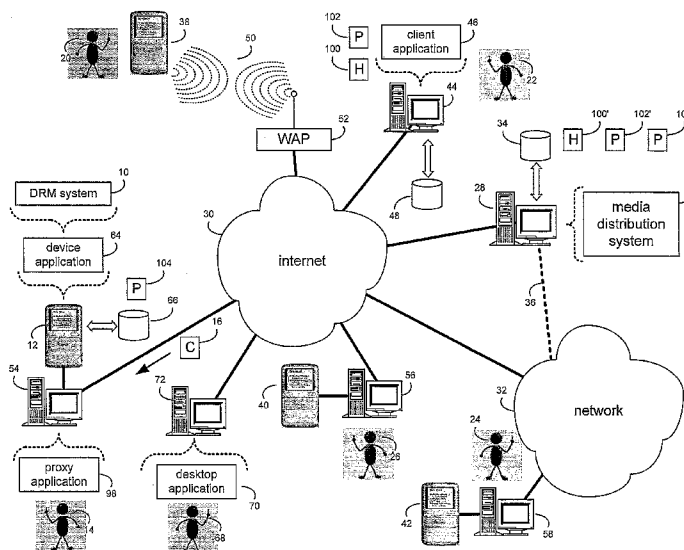— as to applicant's entitlement to apply for and be granted a patent (Rule 4.17(ii))
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(54) Title: PERSONAL MEDIA DEVICE

(57) Abstract: A personal media device includes a housing assembly, a display panel located on the housing assembly, and a control assembly located on the housing assembly. The control assembly includes a slider assembly, a first switch assembly positioned proximate a first side of the slider assembly, and a second switch assembly positioned proximate a second side of the slider assembly. The control assembly is configured to extend across substantially an entire width of the housing assembly.

Personal Media Device

RELATED APPLICATIONS

[0001] This application claims the priority of the following applications, which are herein incorporated by reference: U.S. Provisional Application Serial No.: 60/705,764, entitled, "SYSTEMS AND METHODS FOR PRESENTING MEDIA CONTENT", filed 05 August 2005; U.S. Provisional Application Serial No.: 60/705,969, entitled, "SYSTEMS AND METHODS FOR USING PERSONAL MEDIA DEVICE", filed 05 August 2005; and U.S. Provisional Application Serial No.: 60/705,747, entitled, "PERSONAL MEDIA DEVICE AND METHODS OF USING SAME", filed 05 August 2005.

Technical Field

[0002] This disclosure relates to personal media devices and, more particularly, to personal media devices that interface with a media distribution system.

Background

[0003] Media distribution systems (e.g., the Rhapsody[tm] service offered by RealNetworks, Inc of Seattle, WA) may distribute media content (e.g., audio files, video files, and audio / video files) from a media server to a client electronic device (e.g., an MP3 player). A media distribution system may distribute media content by allowing a user to download media data files and/or receive and process media data streams.

Summary of Disclosure

[0004] In a first implementation, a personal media device includes a housing assembly, a display panel located on the housing assembly, and a control assembly located on the housing assembly. The control assembly includes a slider assembly, a first switch assembly positioned proximate a first side of the slider assembly, and a

second switch assembly positioned proximate a second side of the slider assembly. The control assembly is configured to extend across substantially an entire width of the housing assembly.

[0005] The details of one or more implementations are set forth in the accompanying drawings and the description below. Other features and advantages will become apparent from the description, the drawings, and the claims.

BRIEF DESCRIPTION OF THE DRAWINGS

FIG. 1 is a diagrammatic view of a DRM process, a media distribution system, a client application, a proxy application, and a personal media device coupled to a distributed computing network;

FIG. 2 is an isometric view of the personal media device of FIG. 1;

FIG. 3 is a diagrammatic view of the personal media device of FIG. 1;

FIG. 4 is a front perspective view of the personal media device of FIG. 1;

FIG. 5 is a back perspective view of the personal media device of FIG. 1;

FIG. 6 is a diagrammatic view of a personal media device including an audio user interface;

FIG. 7 is a flow chart illustrating a method of providing an audio user interface;

FIG. 8 is a top view of personal media devices initiating communication by contact;

FIG. 9 is a back perspective view of a personal media device illustrating locations for sensor zones; and

FIG. 10 is a flow chart illustrating a method of initiating communication between devices by contact.

DETAILED   DESCRIPTION   OF   THE   PREFERRED EMBODIMENTS

System Overview:

[0006] Referring to FIG. 1, there is shown a DRM (i.e., digital rights management) process 10 that is resident on and executed by personal media device 12. As will be discussed below in greater detail, DRM process 10 allows a user (e.g., user 14) of personal media device 12 to manage media content resident on personal media device 12. Personal media device 12 typically receives media content 16 from media distribution system 18.

[0007] As will be discussed below in greater detail, examples of the format of the media content 16 received from media distribution system 18 may include: purchased downloads received from media distribution system 18 (i.e., media content licensed to e.g., user 14 for use in perpetuity); subscription downloads received from media distribution system 18 (i.e., media content licensed to e.g., user 14 for use while a valid subscription exists with media distribution system 18); and media content streamed from media distribution system 18, for example. Typically, when media content is streamed from e.g., computer 28 to personal media device 12, a copy of the media content is not permanently retained on personal media device 12. In addition to media distribution system 18, media content may be obtained from other sources, examples of which may include but are not limited to files ripped from music compact discs.

[0008] Examples of the types of media content 16 distributed by media distribution system 18 include: audio files (examples of which may include but are not limited to music files, audio news broadcasts, audio sports broadcasts, and audio recordings of books, for example); video files (examples of which may include but are not limited to video footage that does not include sound, for example); audio/video files (examples of which may include but are not limited to a/v news broadcasts, a/v sports broadcasts, feature-length movies and movie clips, music videos, and episodes of television shows, for example); and multimedia content (examples of which may

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include but are not limited to interactive presentations and slideshows, for example).

[0009] Media distribution system 18 typically provides media data streams and/or media data files to a plurality of users (e.g., users 14, 20, 22, 24, 26). Examples of such a media distribution system 18 include the Rhapsody^{tm} service offered by RealNetworks^{tm} of Seattle, WA.

[0010] Media distribution system 18 is typically a server application that resides on and is executed by computer 28 (e.g., a server computer) that is connected to network 30 (e.g., the Internet). Computer 28 may be a web server running a network operating system, examples of which may include but are not limited to Microsoft Windows 2000 Server^{tm}, Novell Netware^{tm}, or Redhat Linux^{tm}.

[0011] Typically, computer 28 also executes a web server application, examples of which may include but are not limited to Microsoft IIS^{tm}, Novell Webserver^{tm}, or Apache Webserver^{tm}, that allows for HTTP (i.e., HyperText Transfer Protocol) access to computer 28 via network 30. Network 30 may be connected to one or more secondary networks (e.g., network 32), such as: a local area network; a wide area network; or an intranet, for example.

[0012] The instruction sets and subroutines of media distribution system 18, which are typically stored on a storage device 34 coupled to computer 28, may be executed by one or more processors (not shown) and one or more memory architectures (not shown) incorporated into computer 28. Storage device 34 may include but is not limited to a hard disk drive, a tape drive, an optical drive, a RAID array, a random access memory (RAM), or a read-only memory (ROM).

[0013] Users 14, 20, 22, 24, 26 may access media distribution system 18 directly through network 30 or through secondary network 32. Further, computer 28 (i.e., the computer that executes media distribution system 18) may be connected to network 30 through secondary network 32, as illustrated with phantom link line 36.

[0014] Users 14, 20, 22, 24, 26 may access media distribution system 18 through various client electronic devices, examples of which may include but are not limited to personal media devices 12, 38, 40, 42, client computer 44, personal digital

assistants (not shown), cellular telephones (not shown), televisions (not shown), cable boxes (not shown), internet radios (not shown), or dedicated network devices (not shown), for example.

[0015] The various client electronic devices may be directly or indirectly coupled to network 30 (or network 32). For example, client computer 44 is shown directly coupled to network 30 via a hardwired network connection. Further, client computer 44 may execute a client application 46 (examples of which may include but are not limited to Microsoft Internet Explorer^{tm}, Netscape Navigator^{tm}, Rhapsody^{tm} client, RealPlayer^{tm} client, or a specialized interface) that allows e.g., user 22 to access and configure media distribution system 18 via network 30 (or network 32). Client computer 44 may run an operating system, examples of which may include but are not limited to Microsoft Windows^{tm}, or Redhat Linux^{tm}.

[0016] The instruction sets and subroutines of client application 46, which are typically stored on a storage device 48 coupled to client computer 44, are executed by one or more processors (not shown) and one or more memory architectures (not shown) incorporated into client computer 44. Storage device 48 may include but are not limited to a hard disk drive, a tape drive, an optical drive, a RAID array, a random access memory (RAM), or a read-only memory (ROM).

[0017] As discussed above, the various client electronic devices may be indirectly coupled to network 30 (or network 32). For example, personal media device 38 is shown wirelessly coupled to network 30 via a wireless communication channel 50 established between personal media device 38 and wireless access point (i.e., WAP) 52, which is shown directly coupled to network 30. WAP 52 may be, for example, an IEEE 802.11a, 802.11b, 802.11g, Wi-Fi, and/or Bluetooth device that is capable of establishing the secure communication channel 50 between personal media device 38 and WAP 52. As is known in the art, all of the IEEE 802.11x specifications use Ethernet protocol and carrier sense multiple access with collision avoidance (i.e., CSMA/CA) for path sharing. The various 802.11x specifications may use phase-shift keying (i.e., PSK) modulation or complementary code keying (i.e., CCK) modulation,

for example. As is known in the art, Bluetooth is a telecommunications industry specification that allows e.g., mobile phones, computers, and personal digital assistants to be interconnected using a short-range wireless connection.

[0018] In addition to being wirelessly coupled to network 30 (or network 32), personal media devices may be coupled to network 30 (or network 32) via a proxy computer (e.g., proxy computer 54 for personal media device 12, proxy computer 56 for personal media device 40, and proxy computer 58 for personal media device 42, for example).

Personal Media Device:

[0019] For example and referring also to FIG. 2, personal media device 12 may be connected to proxy computer 54 via a docking cradle 60. Typically, personal media device 12 includes a bus interface (to be discussed below in greater detail) that couples personal media device 12 to docking cradle 60. Docking cradle 60 may be coupled (with cable 62) to e.g., a universal serial bus (i.e., USB) port, a serial port, or an IEEE 1394 (i.e., FireWire) port included within proxy computer 54. For example, the bus interface included within personal media device 12 may be a USB interface, and docking cradle 60 may function as a USB hub (i.e., a plug-and-play interface that allows for "hot" coupling and uncoupling of personal media device 12 and docking cradle 60).

[0020] Proxy computer 54 may function as an Internet gateway for personal media device 12. Accordingly, personal media device 12 may use proxy computer 54 to access media distribution system 18 via network 30 (and network 32) and obtain media content 16. Specifically, upon receiving a request for media distribution system 18 from personal media device 12, proxy computer 54 (acting as an Internet client on behalf of personal media device 12), may request the appropriate web page / service from computer 28 (i.e., the computer that executes media distribution system 18). When the requested web page / service is returned to proxy computer 54, proxy computer 54 relates the returned web page / service to the original request (placed by personal media device 12) and forwards the web page / service to personal media

device 12. Accordingly, proxy computer 54 may function as a conduit for coupling personal media device 12 to computer 28 and, therefore, media distribution system 18.

[0021] Further, personal media device 12 may execute a device application 64 (examples of which may include but are not limited to Rhapsody^{tm} client, RealPlayer^{tm} client, or a specialized interface). Personal media device 12 may run an operating system, examples of which may include but are not limited to Microsoft Windows CE^{tm}, Redhat Linux^{tm}, Palm OS^{tm}, or a device-specific (i.e., custom) operating system.

[0022] DRM process 10 may be a component of device application 64 (examples of which may include but are not limited to an embedded feature of device application 64, a software plug-in for device application 64, or a stand-alone application called from within and controlled by device application 64). The instruction sets and subroutines of device application 64 and DRM process 10, which are typically stored on a storage device 66 coupled to personal media device 12, may be executed by one or more processors (not shown) and one or more memory architectures (not shown) incorporated into personal media device 12. Storage device 66 may be, for example, a hard disk drive, an optical drive, a random access memory (RAM), a read-only memory (ROM), a CF (i.e., compact flash) card, an SD (i.e., secure digital) card, a SmartMedia card, a Memory Stick, and a MultiMedia card, for example.

[0023] An administrator 68 typically accesses and administers media distribution system 18 through a desktop application 70 (examples of which may include but are not limited to Microsoft Internet Explorer^{tm}, Netscape Navigator^{tm}, or a specialized interface) running on an administrative computer 72 that is also connected to network 30 (or network 32).

[0024] The instruction sets and subroutines of desktop application 70, which are typically stored on a storage device (not shown) coupled to administrative computer 72, are executed by one or more processors (not shown) and one or more memory architectures (not shown) incorporated into administrative computer 72. The storage

device (not shown) coupled to administrative computer 72 may include but are not limited to a hard disk drive, a tape drive, an optical drive, a RAID array, a random access memory (RAM), or a read-only memory (ROM).

[0025] Referring also to FIG. 3, a diagrammatic view of personal media device 12 is shown. Personal media device 12 may include microprocessor 150, non-volatile memory (e.g., read-only memory 152), and volatile memory (e.g., random access memory 154); each of which may be interconnected via one or more data / system buses 156, 158. Personal media device 12 may also include an audio subsystem 160 for providing e.g., an analog audio signal to an audio jack 162 for removably engaging e.g., a headphone assembly 164, a remote speaker assembly 166, or an ear bud assembly 168, for example. Alternatively, personal media device 12 may be configured to include one or more internal audio speakers (not shown).

[0026] Personal media device 12 may also include a user interface 170 and a display subsystem 172. User interface 170 may receive data signals from various input devices included within personal media device 12, examples of which may include (but are not limited to): rating switches 74, 76; backward skip switch 78; forward skip switch 80; play/pause switch 82; menu switch 84; radio switch 86; and slider assembly 88, for example. Display subsystem 172 may provide display signals to display panel 90 included within personal media device 12. Display panel 90 may be an active matrix liquid crystal display panel, a passive matrix liquid crystal display panel, or a light emitting diode display panel, for example.

[0027] Audio subsystem 160, user interface 170, and display subsystem 172 may each be coupled with microprocessor 150 via one or more data / system buses 174, 176, 178 (respectively).

[0028] During use of personal media device 12, display panel 90 may be configured to display e.g., the title and artist of various pieces of media content 92, 94, 96 stored within personal media device 12. Slider assembly 88 may be used to scroll upward or downward through the list of media content stored within personal media device 12. When the desired piece of media content is highlighted (e.g.,

"Phantom Blues" by "Taj Mahal"), user 14 may select the media content for rendering using play/pause switch 82. User 14 may skip forward to the next piece of media content (e.g., "Happy To Be Just..." by "Robert Johnson") using forward skip switch 80; or skip backward to the previous piece of media content (e.g., "Big New Orleans ..." by "Leroy Brownstone") using backward skip switch 78. Additionally, user 14 may rate the media content as they listen to it by using rating switches 74, 76.

[0029] As discussed above, personal media device 12 may include a bus interface 180 for interfacing with e.g., proxy computer 54 via docking cradle 60. Additionally and as discussed above, personal media device 12 may be wirelessly coupled to network 30 via a wireless communication channel 50 established between personal media device 12 and e.g., WAP 52. Accordingly, personal media device 12 may include a wireless interface 182 for wirelessly-coupling personal media device 12 to network 30 (or network 32) and/or other personal media devices. Wireless interface 182 may be coupled to an antenna assembly 184 for RF communication to e.g., WAP 52, and/or an IR (i.e., infrared) communication assembly 186 for infrared communication with e.g., a second personal media device (such as personal media device 40). Further and as discussed above, personal media device 12 may include a storage device 66 for storing the instruction sets and subroutines of device application 64 and DRM process 10. Additionally, storage device 66 may be used to store media data files downloaded from media distribution system 18 and to temporarily store media data streams (or portions thereof) streamed from media distribution system 18.

[0030] Storage device 66, bus interface 180, and wireless interface 182 may each be coupled with microprocessor 150 via one or more data / system buses 188, 190, 192 (respectively).

[0031] As discussed above, media distribution system 18 distributes media content to users 14, 20, 22, 24, 26, such that the media content distributed may be in the form of media data streams and/or media data files. Accordingly, media distribution system 18 may be configured to only allow users to download media data files. For example, user 14 may be allowed to download, from media distribution

system 18, media data files (i.e., examples of which may include but are not limited to MP3 files or AAC files), such that copies of the media data file are transferred from computer 28 to personal media device 12 (being stored on storage device 66).

[0032] Alternatively, media distribution system 18 may be configured to only allow users to receive and process media data streams of media data files. For example, user 22 may be allowed to receive and process (on client computer 44) media data streams received from media distribution system 18. As discussed above, when media content is streamed from e.g., computer 28 to client computer 44, a copy of the media data file is not permanently retained on client computer 44.

[0033] Further, media distribution system 18 may be configured to allow users to receive and process media data streams and download media data files. Examples of such a media distribution system include the Rhapsody^{tm} service offered by RealNetworks^{tm} of Seattle, WA. Accordingly, user 14 may be allowed to download media data files and receive and process media data streams from media distribution system 18. Therefore, copies of media data files may be transferred from computer 28 to personal media device 12 (i.e., the received media data files being stored on storage device 66); and streams of media data files may be received from computer 28 by personal media device 12 (i.e., with portions of the received stream temporarily being stored on storage device 66). Additionally, user 22 may be allowed to download media data files and receive and process media data streams from media distribution system 18. Therefore, copies of media data files may be transferred from computer 28 to client computer 44 (i.e., the received media data files being stored on storage device 48); and streams of media data files may be received from computer 28 by client computer 44 (i.e., with portions of the received streams temporarily being stored on storage device 48).

[0034] Typically, in order for a device to receive and process a media data stream from e.g., computer 28, the device must have an active connection to computer 28 and, therefore, media distribution system 18. Accordingly, personal media device 38 (i.e., actively connected to computer 28 via wireless channel 50), and client computer

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44 (i.e., actively connected to computer 28 via a hardwired network connection) may receive and process media data streams from e.g., computer 28.

[0035] As discussed above, proxy computers 54, 56, 58 may function as a conduit for coupling personal media devices 12, 40, 42 (respectively) to computer 28 and, therefore, media distribution system 18. Accordingly, when personal media devices 12, 40, 42 are coupled to proxy computers 54, 56, 58 (respectively) via e.g., docking cradle 60, personal media devices 12, 40, 42 are actively connected to computer 28 and, therefore, may receive and process media data streams provided by computer 28.

User Interfaces:

[0036] As discussed above, media distribution system 18 may be accessed using various types of client electronic devices, which may include but are not limited to personal media devices 12, 38, 40, 42, client computer 44, personal digital assistants (not shown), cellular telephones (not shown), televisions (not shown), cable boxes (not shown), internet radios (not shown), or dedicated network devices (not shown), for example. Typically, the type of interface used by the user (when configuring media distribution system 18 for a particular client electronic device) may vary depending on the type of client electronic device to which the media content is being streamed / downloaded.

[0037] For example, as the embodiment shown (in FIG. 2) of personal media device 12 does not include a keyboard and the display panel 90 of personal media device 12 is compact, media distribution system 18 may be configured for personal media device 12 via proxy application 98 executed on proxy computer 54.

[0038] The instruction sets and subroutines of proxy application 98, which are typically stored on a storage device (not shown) coupled to proxy computer 54, may be executed by one or more processors (not shown) and one or more memory architectures (not shown) incorporated into proxy computer 54. The storage device (not shown) coupled to proxy computer 54 may include but are not limited to a hard disk drive, a tape drive, an optical drive, a RAID array, a random access memory (RAM), or a read-only memory (ROM).

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[0039] Additionally and for similar reasons, personal digital assistants (not shown), cellular telephones (not shown), televisions (not shown), cable boxes (not shown), internet radios (not shown), and dedicated network devices (not shown) may use proxy application 98 executed on proxy computer 54 to configure media distribution system 18.

[0040] Further, the client electronic device need not be directly connected to proxy computer 54 for media distribution system 18 to be configured via proxy application 98. For example, assume that the client electronic device used to access media distribution system 18 is a cellular telephone. While cellular telephones are typically not physically connectable to e.g., proxy computer 54, proxy computer 54 may still be used to remotely configure media distribution system 18 for use with the cellular telephone. Accordingly, the configuration information (concerning the cellular telephone) that is entered via e.g., proxy computer 54 may be retained within media distribution system 18 (on computer 28) until the next time that the user accesses media distribution system 18 with the cellular telephone. At that time, the configuration information saved on media distribution system 18 may be downloaded to the cellular telephone.

[0041] For systems that include keyboards and larger displays (e.g., client computer 44), client application 46 may be used to configure media distribution system 18 for use with client computer 44.

Control Set for Personal Media Device:

[0042]   Referring to FIGS. 2, 4 and 5, there is shown a personal media device 12 including a control set 1100 and other features that facilitate user operation and control of functions on personal media device 12. Personal media device 12 may be a dedicated personal media device (e.g., an MP3 player), a personal digital assistant (PDA), a cellular telephone, or other portable or mobile electronic device capable of rendering digital media data. Personal media device 12 may be used to store and render media content such as music tracks and to display information associated with

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the media content. Personal media device 12 may be used, for example, in connection with a media distribution system 18 (see FIG. 1), as described above.

[0043]   Personal media device 12 generally includes a housing 1102 having a front 1104 and a back 1106. In an exemplary embodiment, housing 1102 may be generally rectangular shaped. Personal media device 12 may have rounded corners 1110, 1112, 1114, 1116 between each of the sides 1120, 1122, 1124, 1126. The personal media device 12 may thus fit comfortably in the hands of a user.

[0044]   Control set 1100 may be located on the front 1104 of housing 1102 and below display panel 90. Control set 1100 may include a three key set 1130 centrally located on the front 1104 and extending across substantially the entire width of housing 1102. In an exemplary embodiment, the three key set 1130 includes a menu switch 84, a slider assembly 88 and a radio switch 86. Slider assembly 88 may be located between and adjacent to menu switch 84 and radio switch 86.

[0045]   Menu switch 84 may be a momentary switch used to provide a menu activation signal, which causes one or more menus to be displayed on display panel 90. Radio switch 86 may be a momentary switch used to provide a radio activation signal, which causes a radio function to be initiated on personal media device 12. Slider assembly 88 may be a sliding switch used to provide one or more signals to control, for example, scroll movement, highlighting and/or selecting of one or more items displayed on display panel 90.

[0046]   Control set 1100 may also include rating switches 74, 76 located, for example, between display panel 90 and three key set 1130. Rating switches 74, 76 may be spaced apart, for example, such that rating switch 74 generally aligns with menu switch 84 and rating switch 76 generally aligns with radio switch 86.

[0047]   Rating switch 74 may be a momentary switch used to provide a lower rating signal that indicates a lower rating. Rating switch 76 may be a momentary switch used to provide a higher rating signal that indicates a higher rating. Ratings may apply to media content (e.g., music tracks) being rendered by personal media device 12.

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[0048]   Control set 1100 may also include a backward skip switch 78, a forward skip switch 80, and a play/pause switch 82 located, for example, between three key set 1130 and bottom side 1122 of housing 1102. Backward skip switch 78, forward skip switch 80, and play/pause switch 82 may be spaced apart, for example, such that backward skip switch 78 generally aligns with menu switch 84, forward skip switch 80 generally aligns with radio switch 86 and play/pause switch 82 generally aligns with slider assembly 88.

[0049]   Backward skip switch 78 may be a momentary switch used to provide a backward skip signal that causes personal media device 12 to skip backward to another media content item (e.g., music track) being rendered. Forward skip switch 80 may be a momentary switch used to provide a forward skip signal that causes personal media device 12 to skip forward to another media content item (e.g., music track) being rendered. Play/pause switch 82 may be a momentary switch used to provide a content rendering signal that causes personal media device 12 to alternate between rendering (i.e., play) media content and not rendering (i.e., pause) media content.

[0050]   The three key set 1130 (e.g., menu switch 84, slider assembly 88 and radio switch 86) may be larger than the other controls (e.g., rating switches 74, 76, backward skip switch 78, forward skip switch 80, and play/pause switch 82). The shape, size and placement of the three key set 1130 may thus facilitate user control of main device functions such as displaying menus, scrolling, highlighting, selecting, and activating the radio function.

[0051]   A connector 1140 may be located on housing 1102, for example, on a bottom side 1122. Connector 1140 is configured to engage and electrically connect to docking connector 60.

[0052]   An audio jack (not shown) may be located on housing 1102, for example, on top side 1120. The audio jack may be configured to engage and electrically connect to a cable for a headphone assembly or speakers.

[0053]   Display panel 90 may be an active matrix liquid crystal display panel, a passive matrix liquid crystal display panel, or a light emitting diode display panel, for example. Display panel 90 may also include a transparent cover capable of magnifying the displayed information and giving the appearance of a larger display.

[0054]   Accordingly, personal media device 12 may include a control set and other features to facilitate user operation.

Audio User Interface for Personal Media Device:

[0055]   Referring to FIGS. 6 and 7, there is shown a system and method for providing an audio user interface on a personal media device 12. The audio user interface provides audio messages to the user (e.g., via headphones) to inform the user of various usage events that occur on personal media device 12. In an exemplary embodiment, personal media device 12 may be a dedicated personal media device (e.g., an MP3 player), a personal digital assistant (PDA), a cellular telephone, or other portable or mobile electronic device capable of rendering digital media data. Personal media device 12 may be used to store and render media content such as music tracks and to display information associated with the media content. Personal media device 12 may be used, for example, in connection with a media distribution system 18, as described above and shown in FIG. 1, and a subscription to a media distribution service. Examples of usage events that may occur on personal media device 12 include, but are not limited to, subscription status events, storage status events, battery life status events, user interaction events, and device communication events.

[0056]   Audio message data 1210 may be stored on personal media device 12, for example, on storage device 66. Audio message data 1210 may include audio data files for the audio messages to be played to the user. Audio messages may include voice messages describing the usage events that occur on personal media device 12 and/or an action that needs to be taken by the user. Audio messages may also include non-voice audio messages such as tones that notify and/or prompt the user. Audio message data 1210 may be pre-loaded on personal media device 12 or downloaded to personal media device 12 (e.g., from proxy computer 54 or media distribution system

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18 shown in FIG. 1). A user may also generate audio message data 1210, for example, by digitally recording the audio messages.

[0057]   Event / message mapping data 1212 may also be stored on personal media device 12, for example, on storage device 66. Event / message mapping data 1212 maps the usage events to the audio messages associated with the usage events. Event / message mapping data 1212 may be in the form of a table associating event identifying information with audio message identifying information (e.g., a filename or storage location for an audio data file). Event / message mapping data 1212 may be pre-loaded on personal media device 12 or downloaded to personal media device 12 (e.g., from proxy computer 54 or media distribution system 18 shown in FIG. 1). A user may also configure event / message mapping data 1212, for example, by opening a control panel that allows a user to assign audio messages to usage events.

[0058]   Usage data 1214 may also be stored on personal media device 12, for example, on storage device 66. Usage data 1214 may include data defining when certain status events occur on personal media device 12. For a subscription status event, for example, usage data 1214 may include expiration data defining a predetermined period of time before a user's subscription expires. For a storage status event, usage data 1214 may include data defining a predetermined remaining amount of storage space (e.g., 100 MB remaining on storage device 66). For a battery life status event, usage data 1214 may include data defining a predetermined level of battery power remaining.

[0059]   Event monitoring process 1220 may be resident on and executed by personal media device 12 to monitor usage of personal media device 12 and to determine when certain usage events occur. Event monitoring process 1220 may be a component of device application 64 (FIG. 1), for example, as an embedded feature, software plug-in, or stand-alone application. The instruction sets and subroutines of event monitoring process 1220 may be executed by one or more processors (not shown) and one or more memory architectures (not shown) incorporated into personal media device 12.

[0060]   An exemplary method of providing an audio user interface is illustrated in FIG. 7 and is described below. Personal media device 12 may monitor 1250 usage events as personal media device 12 is being used by the user to render media data files. In particular, event monitoring process 1220 may monitor processes executed on personal media device 12 and usage data 1214 stored on personal media device 12 to determine when usage events occur.

[0061]   To monitor subscription status events, for example, event monitoring process 1220 may monitor a digital rights management (DRM) process to determine a remaining period of time during which media content may be rendered on personal media device 12 under a subscription. One example of a DRM process is described in U.S. Patent Application Serial No. 60/705,969 (Attorney Docket No. REA015), entitled "Systems and Methods for Using Personal Media Device", filed 05 August 2005 and is fully incorporated herein by reference. A subscription status event may be a predetermined number of days remaining under a subscription to a media distribution service. In one example, personal media device 12 may render media content for a period of time (e.g., 30 days) after renewing a device license on personal media device 12. Usage data 1214 may define the occurrence of subscription status events by defining predetermined numbers of days remaining (e.g., 5 days, 1 day, expired). Event monitoring process 1220 may compare the remaining period of time with the predetermined periods of time defined in the usage data 1214 to determine when a subscription status event occurs.

[0062]   To monitor storage status events, event monitoring process 1220 may monitor processes or data defining the remaining storage space on storage device 66. A storage status event may be a predetermined amount of remaining storage space. Usage data 1214 may define the occurrence of storage status events by defining predetermined amounts of remaining storage space (e.g., 100 MB remaining, 50 MB remaining, no space remaining). Event monitoring process 1220 may compare the remaining storage space with the predetermined amounts of remaining storage space defined in the usage data 1214 to determine when a storage status event occurs.

[0063]   To monitor battery life status events, event monitoring process 1220 may monitor processes or data defining the remaining battery power for the battery in personal media device 12. A battery life status event may be a predetermined amount of remaining battery power. Usage data 1214 may define the occurrence of battery life status events by defining predetermined amounts of remaining battery power (e.g., 20% remaining, 10% remaining). Event monitoring process 1220 may compare the remaining amount of battery power with the predetermined amounts of remaining battery power defined in the usage data 1214 to determine when a storage status event occurs.

[0064]   To monitor user interaction events, event monitoring process 1220 may monitor processes that require or request user interaction. In one example, personal media device 12 may prompt a user for a user rating of a media content item (e.g., music track) being played by personal media device 12. Those skilled in the art will recognize that personal media device 12 may monitor and detect various other user interaction events. A user interaction event may be detected when event monitoring process 1220 determines that user interaction (e.g., a user rating) is required or requested.

[0065]   To monitor device communication events, event monitoring process 1220 may monitor processes that initiate and handle communication between personal media device 12 and other devices (e.g., other personal media devices, a wireless access point, a proxy computer). A device communication event may be detected when event monitoring process 1220 determines that communication has been initiated, data has been transferred, and/or communication has been terminated.

[0066]   If personal media device 12 detects 1252 a usage event, personal media device 12 may retrieve 1254 an audio message data file associated with the detected event. Event monitoring process 1220, for example, may access event / message mapping data 1212 to identify and locate the audio message data file associated with the identifying information for the detected event. Personal media

device 12 may then access audio message data 1210 to retrieve the associated audio message data file.

[0067]   Personal media device 12 then renders the associated audio message data file to generate an analog audio message output signal. Audio subsystem 160 on personal media device 12, for example, may process the audio message data file to generate the audio message output signal. Audio subsystem 160 may provide the audio message output signal to an audio output (e.g., output jack 162). A user may thus hear the audio message through headphone assembly 164, remote speaker assembly 166, or ear bud assembly 168 coupled to output jack 162. Alternatively, the audio message output signal may be sent to internal speakers (not shown) in personal media device 12.

[0068]   For subscription status events, the audio messages may include voice messages stating the remaining period of time under the subscription (e.g., "You have 5 days remaining under your subscription" or "Your subscription has expired"). The voice message may also state what action needs to be taken by the user (e.g., "You must renew your subscription within the next 5 days" or "You must now renew your subscription").

[0069]   For storage status events, the audio messages may include voice messages stating the remaining storage space (e.g., "You have 100 megabytes of storage space remaining" or "Your hard drive is full"). The voice messages may also state an action to be taken by the user (e.g., "You must delete music from your hard drive" or "You must connect to media distribution service").

[0070]   For battery life status events, the audio messages may include voice messages stating the remaining battery power (e.g., "You have 10 percent of your battery power remaining" or "You have less than about 1 day of battery power remaining"). The voice messages may also state an action to be taken by the user (e.g., "You should recharge your battery").

[0071]   For user interaction events, the audio messages may include voice messages prompting the user to take an action (e.g., "Please enter a rating for this song" or "Press play to begin your playlist").

[0072]   For device communication events, the audio messages may include voice messages notifying the user of the initiation of communication, the transfer of data, or the termination of communication (e.g., "You have successfully connected to another device" or "You have received a user profile" or "Communication has been terminated").

[0073]   The examples of usage events and audio messages are described herein for exemplary purposes only. Those skilled in the art will recognize that personal media device 12 may monitor various other events and may play various other audio messages.

[0074]   Accordingly, the audio user interface facilitates notifying the user of status information and other events, particularly when using a mobile device having a limited display environment.

Initiating Communication between Personal Media Devices by Contact:

[0075]   Referring to FIGS. 8-10, there is shown a system and method for initiating communication between personal media devices 12, 12' by contact. In an exemplary embodiment, personal media device 12 may be a dedicated personal media device (e.g., an MP3 player), a personal digital assistant (PDA), a cellular telephone, or other portable or mobile electronic device capable of rendering digital media data. The system and method described herein may be used, however, with other mobile devices. Personal media device 12 may be used to store and render media content such as music tracks and to display information associated with the media content. Personal media device 12 may be used, for example, in connection with a media distribution system 18 (see FIG. 1), as described above. A data transfer may involve a transfer of user profiles (e.g., data identifying a user), a transfer of user personas (e.g., data defining a user's activities and/or preferences), a device-to-device transfer of media content (e.g., audio data files), and/or a transfer of media playlists.

[0076]   Personal media devices 12, 12' may include one or more sensor zones 1300, 1300' including, for example, embedded sensors that sense contact by another personal media device and provide data transfer initiation signals. The data transfer initiation sensors in sensor zones 1300, 1300' may include any known or later-developed sensors capable of sensing physical contact or close proximity of another device or sensor and capable of providing a signal. Examples of sensors include, but are not limited to, a momentary switch that activates by physical contact and a proximity sensor that uses an electromagnetic field to sense objects in close proximity.

[0077]   FIG. 8 shows sensor zones 1300, 1300' located on the top sides 1120, 1120' of personal media devices 12, 12'. Alternatively or additionally, sensors may be located in various other locations on personal media devices 12, 12'. As shown in FIG. 9, for example, sensor zones 1310, 1312, 1314, 1316, 1318 may be located in various locations on the back 1106 of personal media device 12 and/or sensor zones 1320, 1322, 1324, 1326 may be located in various locations on other sides 1122, 1124 of personal media device 12. The locations shown are merely illustrative.

[0078]   The sensors may be coupled to microprocessor 150 (shown in FIG. 3) in personal media device 12. As described above, personal media device 12 may include a wireless interface 182 for wirelessly-coupling personal media device 12 to a network and/or to other personal media devices. Wireless interface 182 may be coupled to an antenna assembly 184 for RF communication and/or an infrared (IR) communication assembly 186 for infrared communication. A wireless data transfer system (not shown) may be resident on and executed by personal media device 12 to handle wireless data transfer. The wireless data transfer system may be a component of device application 64 (FIG. 1), for example, as an embedded feature, software plug-in, or stand-alone application. The instruction sets and subroutines of wireless data transfer system may be executed by one or more processors (not shown) and one or more memory architectures (not shown) incorporated into personal media device 12.

[0079] The wireless data transfer may be handled using any wireless protocol or standard currently known or later-developed for wirelessly transferring data between electronic devices. According to one example, the wireless data transfer may be effected using a short-range radio technology known to those skilled in the art such as Bluetooth. Alternatively, the wireless data transfer may be effected using an infrared data communications protocol known to those skilled in the art such as a protocol complying with a standard defined by the Infrared Data Association (IrDA). Other wireless protocols and standards that may be used include, but are not limited to, IEEE 802.11a, 802.11b, 802.11g, and Wi-Fi.

[0080] An exemplary method for initiating communication by physical contact is illustrated in FIG. 10 and described in greater detail below. A user of one personal media device 12 may place 1350 personal media device 12 into contact with another personal media device 12'. As use herein, contact means physical contact (i.e., touching) or close proximity (i.e., within a range of a proximity sensor). The personal media devices 12, 12' are positioned such that contact is achieved in sensor zones 1300, 1300' on both personal media devices 12, 12'

[0081] The users may manipulate personal media devices 12, 12' until contact is sensed 1352. Upon sensing 1352 contact, personal media device 12 initiates 1354 a wireless handshake protocol. The data transfer initiation sensors, for example, may provide data transfer initiation signals to microprocessor 150, which may execute the instructions to initiate a wireless hand shake protocol for data transmission via wireless interface 182. In an exemplary embodiment, personal media devices 12, 12' may establish a secure communication channel, for example, by using session keys to encrypt and decrypt data being transferred using encryption techniques known to those skilled in the art.

[0082] When the hand shake protocol is completed and communication is established, personal media device 12 may begin transferring 1356 data. Personal media device 12 may provide a data transfer notification (e.g., by displaying a pop up screen) to the user to indicate that data transfer has begun.

[0083]   Accordingly, a system and method for initiating communication between devices by contact facilitates the initiation of a wireless data transfer without having to navigate through layers of menus on a personal media device, as required currently for wireless data transmissions.

[0084]   A number of implementations have been described. Nevertheless, it will be understood that various modifications may be made. Accordingly, other implementations are within the scope of the following claims.

WHAT IS CLAIMED IS:

1.   A personal media device comprising:

a housing assembly;

a display panel located on the housing assembly;

a control assembly located on the housing assembly, the control assembly including:

a slider assembly,

a first switch assembly positioned proximate a first side of the slider assembly, and

a second switch assembly positioned proximate a second side of the slider assembly;

wherein the control assembly is configured to extend across substantially an entire width of the housing assembly.

2.   The personal media device of claim 1 further comprising:

one or more additional control switches positioned proximate the control assembly.

3.   The personal media device of claim 2 wherein:

the one or more additional switches includes one or more ratings switches configured to allow a user to provide feedback concerning one or more media data files.

4.   The personal media device of claim 1 further comprising:

a bus interface assembly for releasably coupling the personal media device to a docking cradle.

5.   The personal media device of claim 1 further comprising:

one or more processors and one or more memory architectures configured to execute a digital rights management process.

6.   The personal media device of claim 1 further comprising:

a storage device for storing one or more media data files.

7.   The personal media device of claim 1 wherein:

the slider assembly includes a sliding switch assembly configured to allow for bidirectional movement and configured to generate one or more signals in response to the bidirectional movement.

8.   The personal media device of claim 1 further comprising:

an audio subsystem for providing an audio signal to an audio jack positioned on the housing assembly, the audio signal being generated while rendering one or more media data files.

9.   The personal media device of claim 1 further comprising:

a wireless interface configured to wirelessly-couple the personal media device with one or more of: a network; and another personal media device.

10.   The personal media device of claim 1 wherein the personal media device is chosen from the group consisting of an MP3 player, a personal digital assistant, a cellular telephone, an internet radio, and a dedicated network device.
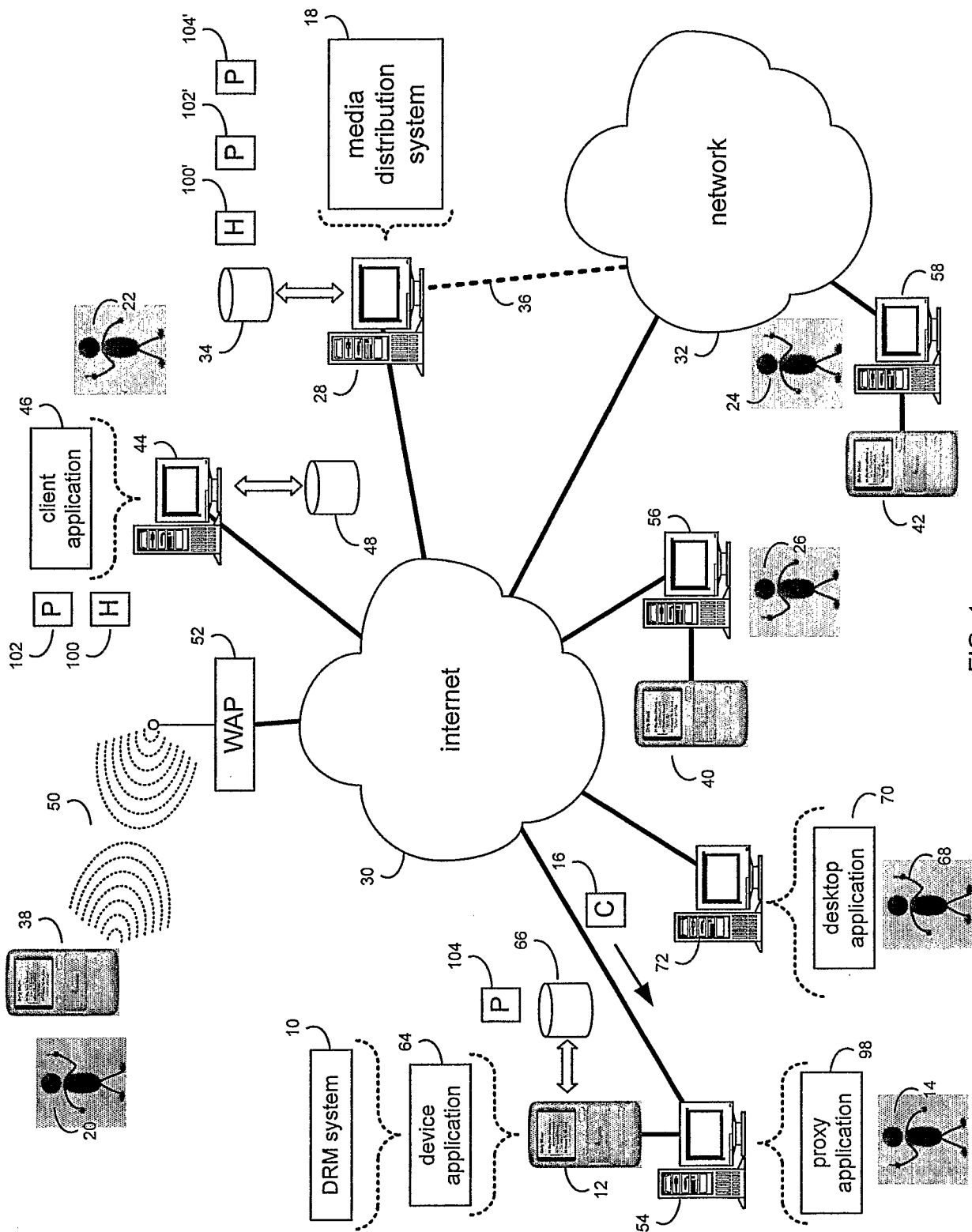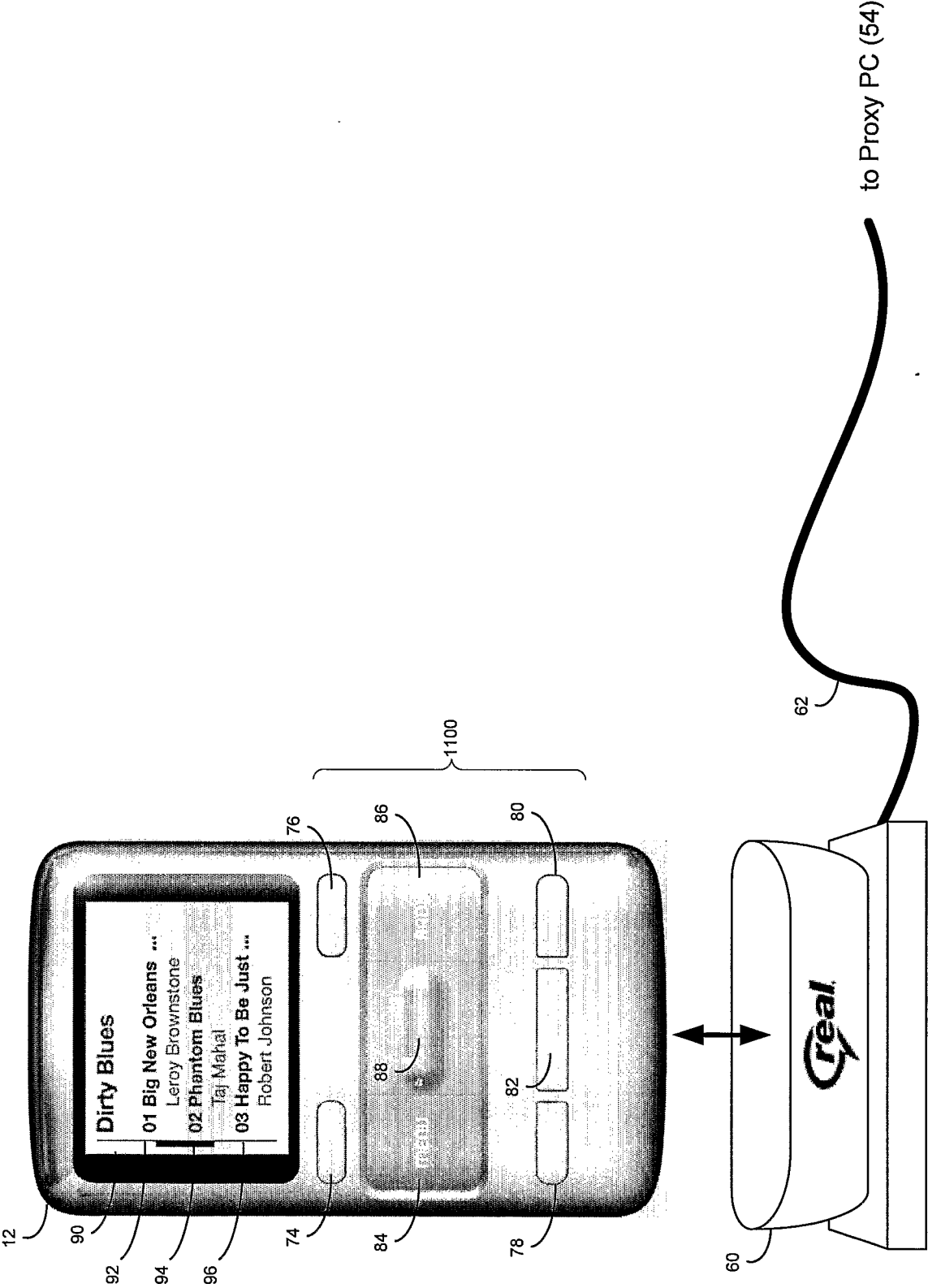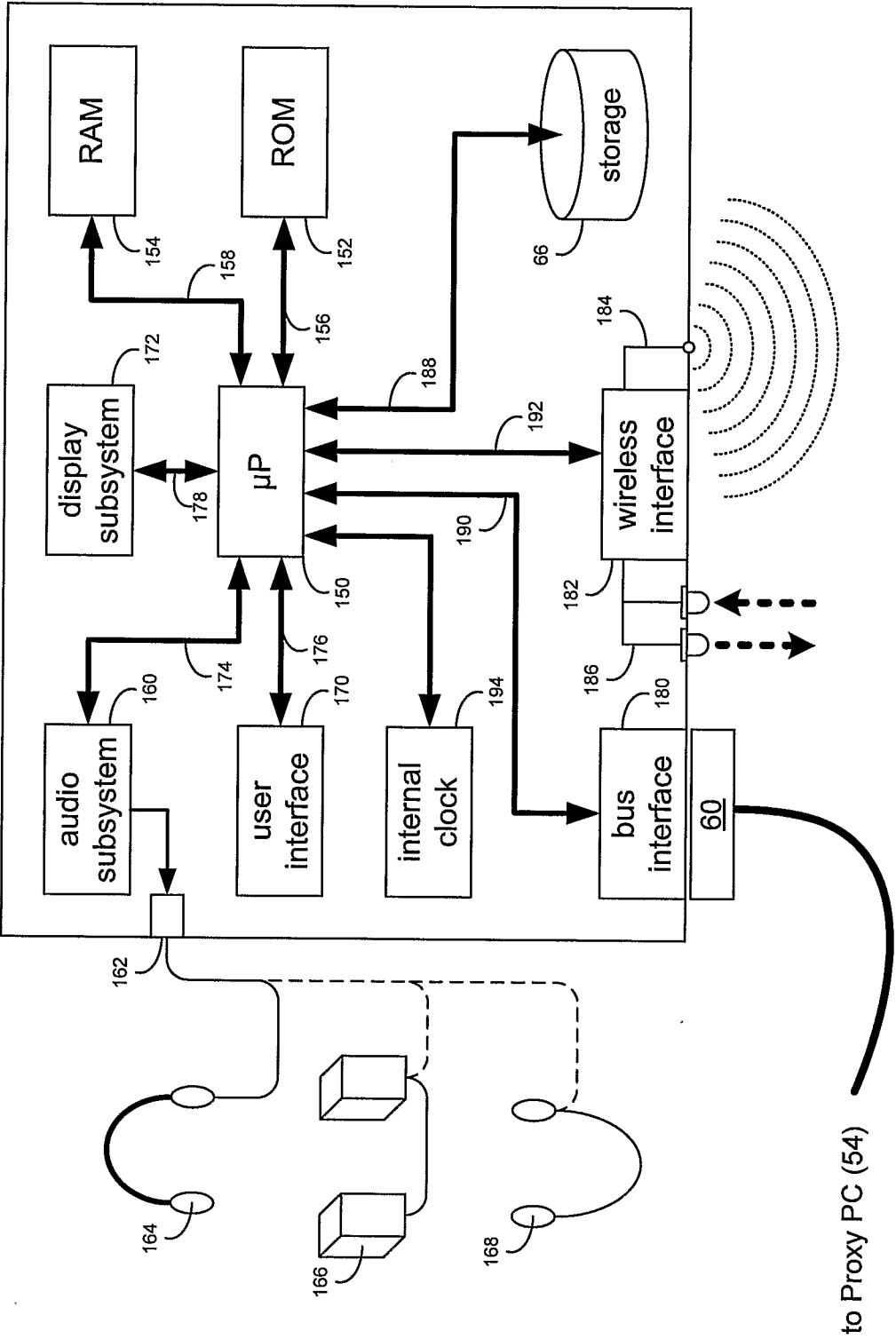
11.   A control assembly configured to interface with a personal media device, the control assembly including:

        a slider assembly,

        a first switch assembly positioned proximate a first side of the slider assembly, and

        a second switch assembly positioned proximate a second side of the slider assembly.

12.   The control assembly of claim 11 wherein:

        the slider assembly includes a sliding switch assembly configured to allow for bidirectional movement and configured to generate one or more signals in response to the bidirectional movement.

13.   The control assembly of claim 1 wherein the personal media device is chosen from the group consisting of an MP3 player, a personal digital assistant, a cellular telephone, an internet radio, and a dedicated network device.

FIG. 1

to Proxy PC (54)

62

FIG. 2

1100

76

86

80

Dirty Blues

01 Big New Orleans ...
   Leroy Brownstone
02 Phantom Blues
   Taj Mahal
03 Happy To Be Just ...
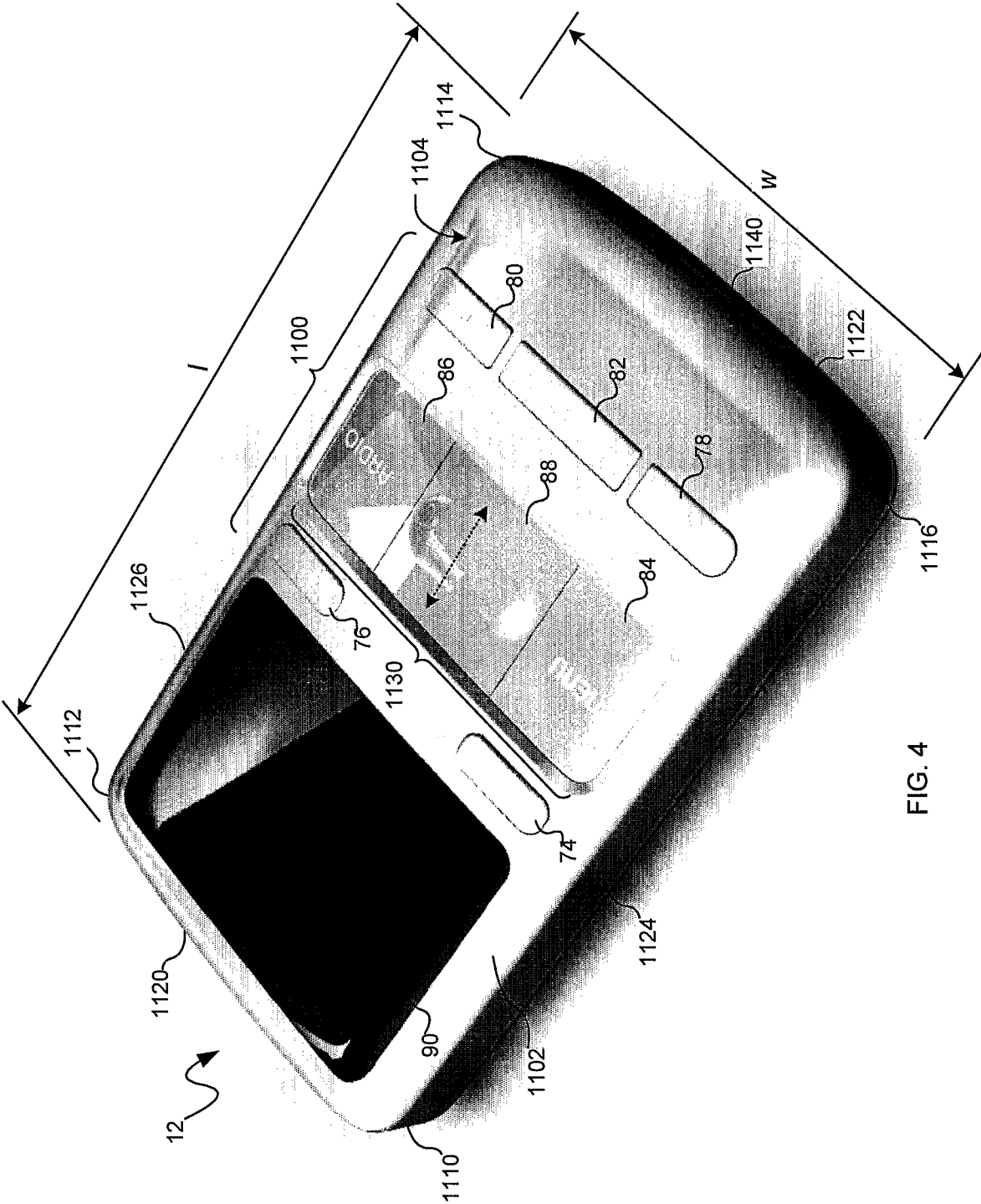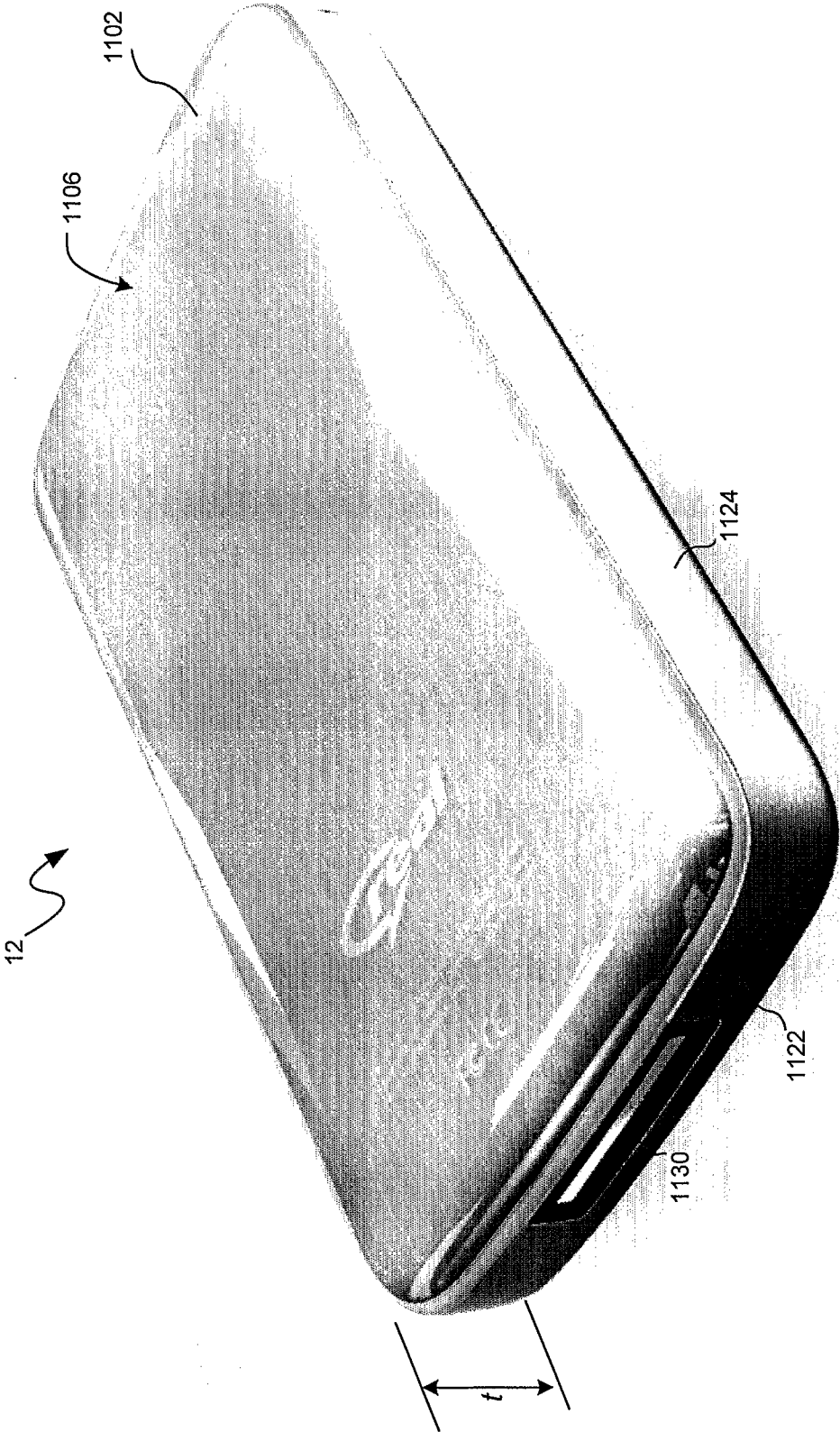   Robert Johnson

88

82

12

90
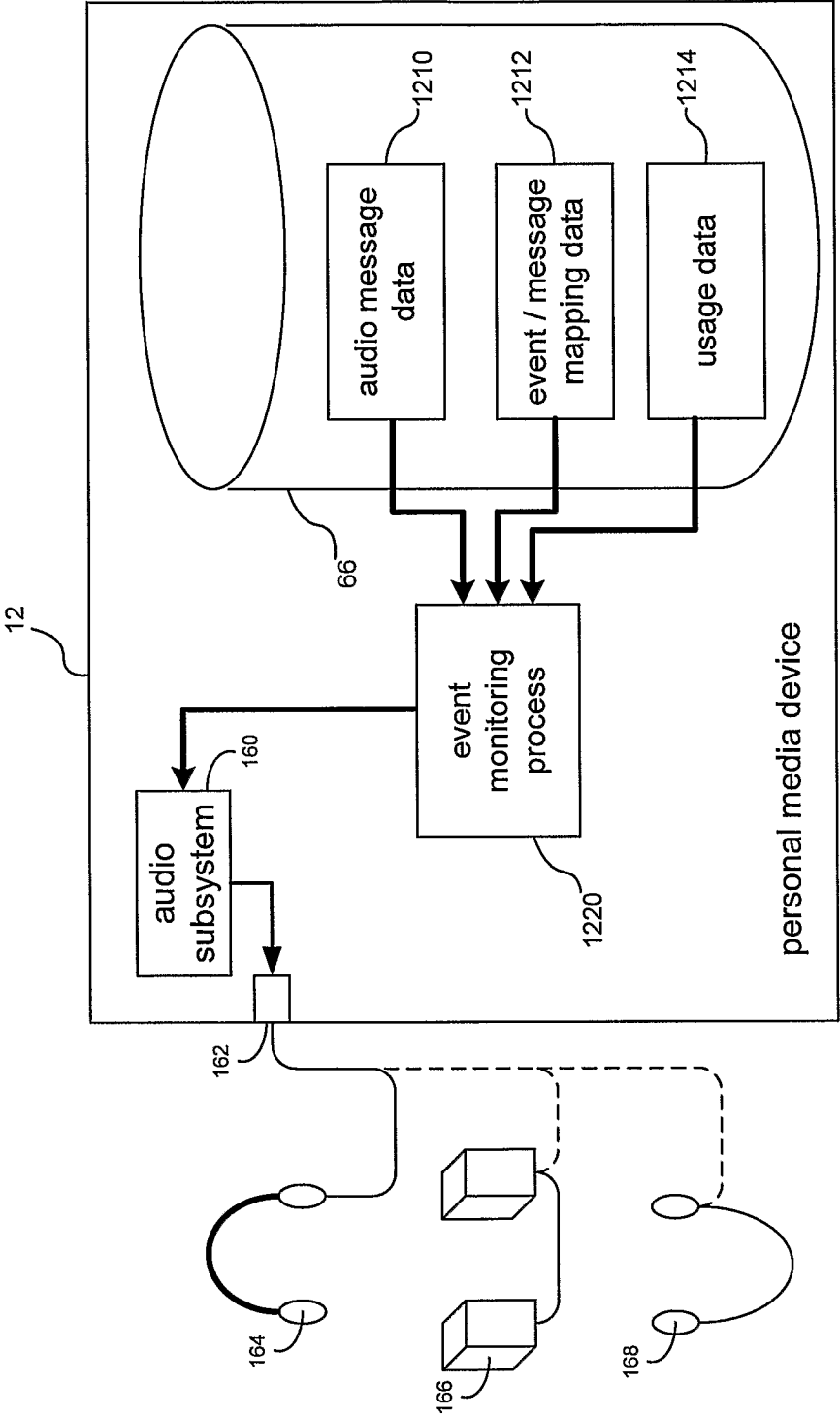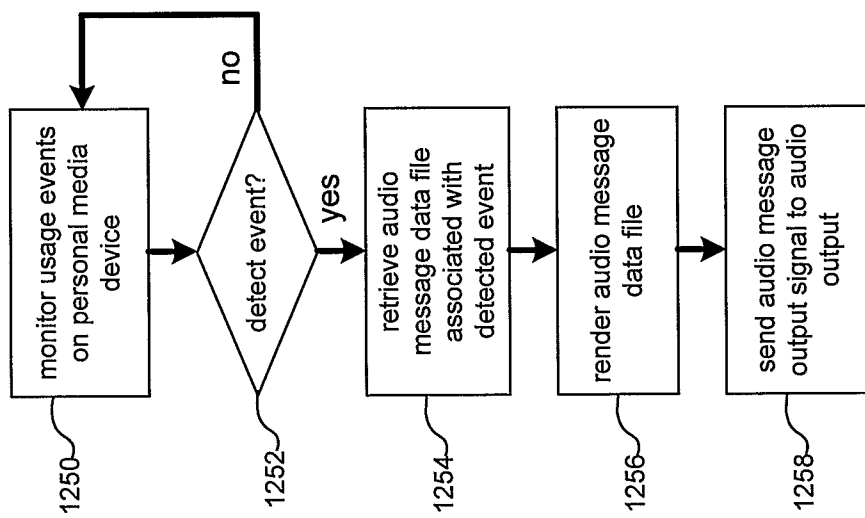
92

94

96

74

84

78

real

60

FIG. 3

to Proxy PC (54)

FIG. 4

FIG. 5

FIG. 6

FIG. 7

FIG. 8

FIG. 9

FIG. 10