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Application Number	60/806 769
Filing Date	
First Named Inventor	Steve W Goldstein
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Attorney Docket Number	

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Signature

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Name Steve W. Goldstein

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5.22.07

Telephone

561-212-6163

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Electronic Acknowledgement Receipt	
EFS ID:	1821712
Application Number:	60806769
International Application Number:	
Confirmation Number:	5148
Title of Invention:	Personalized Services delivered to a Personal Audio Assistant (PAA)
First Named Inventor/Applicant Name:	Steven Wayne Goldstein
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Filer:	John Patrick Keady
Filer Authorized By:	
Attorney Docket Number:	
Receipt Date:	30-MAY-2007
Filing Date:	08-JUL-2006
Time Stamp:	13:49:21
Application Type:	Provisional

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Application Data Sheet 37 CFR 1.76		Attorney Docket Number	
		Application Number	
Title of Invention	Personalized Services delivered to a Personal Audio Assistant (PAA)		
The application data sheet is part of the provisional or nonprovisional application for which it is being submitted. The following form contains the bibliographic data arranged in a format specified by the United States Patent and Trademark Office as outlined in 37 CFR 1.76. This document may be completed electronically and submitted to the Office in electronic format using the Electronic Filing System (EFS) or the document may be printed and included in a paper filed application.			

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Applicant Information:

Applicant 1						Remove	
Applicant Authority		☒ Inventor			☐ Legal Representative under 35 U.S.C. 117		☐ Party of Interest under 35 U.S.C. 118
Prefix	Given Name	Middle Name		Family Name		Suffix	
	Steven	Wayne		Goldstein			
Residence Information (Select One) ☒ US Residency ☐ Non US Residency ☐ Active US Military Service							
City	Delray Beach	State/Province	FL	Country of Residence i		US	
Citizenship under 37 CFR 1.41(b) i		US					
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Address 1		16390 Maddalena Place					
Address 2							
City	Delray Beach			State/Province	FL		
Postal Code	33446			Country i	US		
All Inventors Must Be Listed - Additional Inventor Information blocks may be generated within this form by selecting the Add button.							
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Name 1		Steve Goldstein		Name 2			
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Address 2							
City		Delray Beach		State/Province	FL		
Country i	US			Postal Code	33446		
Phone Number		561-865-0365		Fax Number			
Email Address		Sgoldstein@thebestmedicine.com				Add Email	Remove Email
Email Address		sgoldstein@offspringmedia.com				Add Email	Remove Email
Email Address		mhbehm@aol.com					Remove Email

Application Data Sheet 37 CFR 1.76		Attorney Docket Number	
		Application Number	
Title of Invention	Personalized Services delivered to a Personal Audio Assistant (PAA)		

Application Information:

Title of the Invention	Personalized Services delivered to a Personal Audio Assistant (PAA)		
Attorney Docket Number		Small Entity Status Claimed	☒
Application Type	Provisional		
Subject Matter	Utility		
Suggested Class (if any)		Sub Class (if any)	
Suggested Technology Center (if any)			
Total Number of Drawing Sheets (if any)	3	Suggested Figure for Publication (if any)	
Publication Information:			
☐ Request Early Publication (Fee required at time of Request 37 CFR 1.219)			
☐ Request Not to Publish. I hereby request that the attached application not be published under 35 U.S.C. 122(b) and certify that the invention disclosed in the attached application has not been 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.			

Representative Information:

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Please Select One:	☒ Customer Number	☐ US Patent Practitioner	☐ US Representative (37 CFR 11.9)
Customer Number	32146		

Domestic Priority Information:

This section allows for the applicant to claim benefit under 35 U.S.C. 119(e), 120, 121, or 365(c). Providing this information in the application data sheet constitutes the specific reference required by 35 U.S.C. 119(e) or 120, and 37 CFR 1.78(a)(2) or CFR 1.78(a)(4), and need not otherwise be made part of the specification.			
Prior Application Status		Remove	
Application Number	Continuity Type	Prior Application Number	Filing Date (YYYY-MM-DD)
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This section allows for the applicant to claim benefit of foreign priority and to identify any prior foreign application for which priority is not claimed. Providing this information in the application data sheet constitutes the claim for priority as required by 35 U.S.C. 119(b) and 37 CFR 1.55(a).

Application Data Sheet 37 CFR 1.76		Attorney Docket Number	
		Application Number	
Title of Invention	Personalized Services delivered to a Personal Audio Assistant (PAA)		

			Remove
Application Number	Country ⁱ	Parent Filing Date (YYYY-MM-DD)	Priority Claimed
			☒ Yes ☐ No
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Assignee 1				Remove
If the Assignee is an Organization check here. ☐				
Prefix	Given Name	Middle Name	Family Name	Suffix
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Signature	/stevengoldstein/			Date (YYYY-MM-DD)	2006-07-07
First Name	Steven	Last Name	Goldstein	Registration Number	

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Personalized Services delivered to a Personal Audio Assistant

Abstract

This provisional patent describes a system for Personalized Services delivered to a Personal Audio Assistant incorporated within a headphone. Personalized Services include content such as music files (for preview or purchase) related to a user's preferences, reminders from personal scheduling software, delivery and text-to-speech, speech-to-text processing of email, marketing messages, delivery and text-to-speech of stock market information, medication reminders, foreign language instruction, academic instruction, time and date information, speech-to-speech delivery, instructions from a GPS system and others. A Personal Audio Assistant is an audio playback platform for providing the user with Personalized Services.

The embodiments within disclose a Personal Audio Assistant system that is included as part of a Headphone system. The Personal Audio Assistant is capable of digital audio playback, mitigating the need to carry a personal music player. Furthermore, a subscription-based service provides audio content to the user through the Personal Audio Assistant. The type of audio content, which is automatically provided to the user, is based on the user's preferences, which are obtained through a registration process.

The audio content, which is seamlessly downloaded to the Personal Audio Assistant in the background, is managed from a Server system and is only available on the Personal Audio Assistant for a predetermined period of time or for a fixed number of playback counts. However, the user can purchase any music file or electronic book directly from the Personal Audio Assistant with a simple one-click control interface, storing the purchased audio content on the Personal Audio Assistant as well as storing the content permanently in a user storage lock-box location on the Server system.

The system provides for audio content to be new and "fresh" each time the user auditions the content. As such, the content is typically auditioned in a first-in : first-out scenario. In one such example, the user has turned on the Personal Audio Assistant at 8:00 am and by 10:00 am has auditioned 2 hours of content that were created for the user as a manifestation of the user's choices of their preferences of genre, artist, their demographics, day of the week, time of day and purchase history. The system also provides for the elimination of a particular song or playlist *in situ*.

As the user's Listening History Envelope is updated based on experience, subsequent downloads will only contain content incorporating these revised preferences. The Personal Audio Assistant provides for ample memory, thus permitting hours of uninterrupted playback without the need to download additional content from the server. When in need, the Personal Audio Assistant automatically interrogates various communication platforms as it searches for connections. Once a connection is made, the Listener History Envelope file is uploaded to the server, and a new set of personalized playlist content is downloaded to the Personal Audio Assistant. Accordingly, as the Personal Audio Assistant content is auditioned and thus depleted, the communications system provides for constant replenishment.

In another embodiment, the Personal Audio Assistant also provides for a new set of business solutions to be offered to the music industry. As the personalized audio content is only available for audition for a limited period of time, and may not be sent to the user again from for weeks to months, the user's purchasing behavior may be demonstrated as spontaneous. The basic model of "Try before you buy" is the expected outcome. In another iteration, the distributor of the music may choose to offer discounts, which may be time-sensitive or quantity-sensitive in nature, in effect promoting greater purchase activity from the user.

In another iteration, while in audition a user may wish to place the desired content in a hold status. The hold status forms the basis of a "wish list," thus allowing the user to hold for future consideration audio content while it is being auditioned. This content resides in the memory of the Personal Audio Assistant for a defined period, and is this automatically erased, or the user may do so manually. The selected content will also appear on the user's computer via a URL address; here it resides on the server ready for audition or purchase and download.

The system is designed to operate as simply as possible. Using a single button, which has multiple contacts, the interface allows the user to purchase, delete, skip to next, and adds to wish list and even control volume.

In another iteration, the user may download their own music to the Personal Audio Assistant for audition.

The Personal Audio Assistant system is capable of text-to-speech processing and can interface with personal scheduling software to provide auditory schedule reminders for the user. Auditory reminders relating to the user's medication schedule are also generated by the system.

The present invention includes input Acoustic Transducers (microphones) for capturing user's speech as well as Environmental Audio. In further embodiments, stereo input Acoustic Transducers capture Environmental Audio, and, mixing it with the audio signal path, present the ambient sound field to the user, mitigating the need to remove the Headphone apparatus for normal conversation.

The embodiments within also describe various scenarios for the delivery and consumption of audio content. The Personal Audio Assistant can store and play back audio content in compressed digital audio formats. In one embodiment, the storage memory of the Personal Audio Assistant is completely closed to the end-user and controlled from the Server. This allows for audio content to be distributed on a temporary basis, as part of a subscription service. In another iteration of the present invention, the storage memory of the Personal Audio Assistant is not completely closed to the end-user, allowing the user to transfer audio content to the Personal Audio Assistant from any capable device such as a Personal Computer or a Personal Music Player.

In another iteration, the Personal Audio Assistant automatically scans for other Bluetooth-enabled audio playback systems and notifies the user that additional devices are available. These additional devices may include a Bluetooth video system, television system, personal video player, video camera, cell phone, another Personal Audio Assistant and others.

In another iteration, the Personal Audio Assistant may be directly connected to a Terrestrial Radio receiver, or have such a receiver built in to the system.

In another embodiment, a technique known as Sonification may be used to convey statistical or other numerical information to a headphone. For example, the user would be able to receive information about the growth or decline of a particular stock, groups of stocks or even sectors of the markets through the Personal Audio Assistant. Many different components can be altered to change the user's perception of the sound, and in turn, their perception of the underlying information being portrayed. An increase or decrease in some level of share price or trading levels may be presented to the user. A stock market price could be portrayed by an increase in the frequency of a sine tone as the stock price rose, and a decline in frequency as it fell. To allow the user to determine that more than one stock was being portrayed, different timbres and spatial locations might be used for the different stocks, or they may be played to the user from different points in space, for example, through different sides of their headphones. The user can act upon this auditory information and use the controls built-in to the headphone to either purchase or sell a particular stock position.

Furthermore, specific sonification techniques and preferences can be presented to the user as “themes” from which the user can select. For example, one theme might auralize the current trading price of one stock with an ambient sine tone in the left ear, the price of another stock in the right ear, their respective trade volumes as perceived elevation using personalized head-related transfer function binauralization, and the current global index or other market indicator as the combined perceptual loudness of both tones. Such a scheme affords ambient auditory display in this example of five dimensions of financial data without compromising the user’s ability to converse or work on other tasks. In another embodiment, the system affords users the ability to customize themes to their liking and to rapidly switch among them using simple speech commands. Additionally, the user may search the web from voice commands and receive results via text to speech synthesizer

In another iteration, the Personal Audio Assistant may function as a tool to locate other users of Personal Audio Assistant who share common interests, or who are searching for particular attributes of other users. Whereas the 1st user has stored specific personal information in the Public Data memory of the Personal Audio Assistant, an example of which might be related to schools attended, marital status, profession etc, or the 1st user may be in search of another user with these attributes and whereas 2nd user of a Personal Audio Assistant comes within communication range of the 1st user, the individual Personal Audio Assistants communicate with each other, access the personal information stored in each of their respective Public Data memory’s to ascertain if these users have common interests. If a match occurs, each unit may contain both audible and visual indicators announcing that a match has been made and thus each user may start dialog either physically or electronically via the environmental microphones.

Definitions

Acoustic Isolation Cushion

An “Acoustic Isolation Cushion” shall be defined as a circum-aural or intra-aural device that provides acoustic isolation from Environmental Noise. Acoustic Isolation Cushions may be included as part of a Headphones system, allowing the output of the acoustical transducers to reach the ear unimpeded, but still providing acoustic isolation from Environmental Noise.

Acoustic Transducer

An “Acoustic Transducer” shall be defined as a device that converts sound pressure level variations into electronic voltages or vice versa. Acoustic Transducers include microphones, loudspeakers, Headphones, and other devices.

Audio Playback

“Audio Playback” shall be defined as the auditory stimuli generated when Playback Hardware reproduces audio content (music, speech, etc) for a listener or a group of listeners listening to Headphones.

Audition

“Audition” shall be defined as the process of detecting sound stimulus using the human auditory system. This includes the physical, psychophysical, psychoacoustic, and cognitive processes associated with the perception of acoustic stimuli.

Client

A “Client” shall be defined as a system that communicates with a Server, usually over a communications network, and directly interfaces with a user. Examples of Client systems include personal computers and mobile phones.

Communications Port

A Communication Port shall be defined as an interface port supporting bidirectional transmission protocols (TCP/IP, USB, IEEE 1394, IEEE 802.11, Bluetooth, A2SP, GSM, CDMA, or others) via a communications network (e.g., the Internet, cellular networks).

Control Data

“Control Data” shall be defined as information that dictates the operating parameters for a system or a set of systems.

Earcon

An Earcon shall be defined as a Personalized Audio signal that informs the User of a pending event typically inserted in advance of the upcoming audio content.

Ear Mold Style

“Ear Mold Style” shall be defined as a description of the form factor for an intra-aural device (e.g., hearing aids). Ear Mold Styles include completely in the canal (CIC), in the canal (ITC), in the ear (ITE), and behind the ear (BTE).

Environmental Audio

“Environmental Audio” shall be defined as auditory stimuli of interest to the user in the environment where the user is present. Environmental Audio includes speech and music in the environment.

Environmental Noise

“Environmental Noise” shall be defined as the auditory stimuli inherent to a particular environment where the user is present and which the user does not wish to audition. The drone of highway traffic is a common example of Environmental Noise. Note that Environmental Noise and Audio Playback are two distinct types of auditory stimuli. Environmental Noise does not typically include Music or other audio content.

E-Tailing System

An "E-tailing System" shall be defined as a web-based solution through which a user can search, preview and acquire some available product or service. Short for “electronic retailing,” E-tailing is the offering of retail goods or services on the Internet. Used in Internet discussions as early as 1995, the term E-tailing seems an almost inevitable addition to e-mail, e-business, and e-commerce. E-tailing is synonymous with business-to-consumer (B2C) transactions. Accordingly, the user may be required to register by submitting personal information, and the user may be required to provide payment in the form of Currency or other consideration in exchange for the product or service. Optionally, a sponsor may bear the cost of compensating the E-tailer, while the user would receive the product or service.

Generic HRTF

A “Generic HRTF” shall be defined as a set of HRTF data that is intended for use by any Member. A Generic HRTF can provide a generalized model of the parts of the human anatomy relevant to audition and localization, or simply a model of the anatomy of an individual other than the Member. The application of Generic HRTF data to Audio Content provides the least convincing Spatial Image for the Member, relative to Semi-Personalized and Personalized HRTF data. Generic HRTF data is generally retrieved from publicly available databases such as the CIPIC HRTF database.

Headphones

“Headphones” (also known as earphones, earbuds, stereophones, headsets Canalphones, or the slang term “cans”) are a pair of transducers that receive an electrical signal from a media player, communication receivers and transceivers, and use speakers placed in close proximity to the ears (hence the name earphone) to convert the signal into audible sound waves. Headphones are intended as personal listening devices that are placed either circum-aural or intra-aural according to one of the Ear Mold Styles, as well as other devices that meet the above definition such as advanced eyewear that includes Acoustical Transducers (i.e. Dataview). Headphones may also include stereo input Acoustic Transducers (microphones) included as part of the Ear Mold Style form factor.

HRTF

“HRTF” is an acronym for head-related transfer function – a set of data that describes the acoustical reflection characteristics of an individual’s anatomy relevant to audition. Although in practice they are distinct (but directly related), this definition of HRTF encompasses the head-related impulse response (HRIR) or any other set of data that describes some aspects of an individual’s anatomy relevant to audition.

Informed Consent

“Informed Consent” shall be defined as a legal condition whereby a person can be said to have given formal consent based upon an appreciation and understanding of the facts and implications associated with a specific action. For minors or individuals without complete possession of their faculties, Informed Consent includes the formal consent of a parent or guardian.

Listening History Envelope

“Listening History Envelope” shall be defined as a record of a user’s listening habits over time. The envelope includes system data, time system was turned off, time system is auditioning content, time stamp of content being auditioned, content which is: skipped, deleted played multiple times, saved in the Wish List, and time between listening sessions.

Music

“Music” shall be defined as a form of expression in the medium of time using the structures of tones and silence to create complex forms in time through construction of patterns and combinations of natural stimuli, principally sound. Music may also be referred to as audio media or audio content.

Playback Hardware

Any device used to play previously recorded or live streaming audio. Playback Hardware includes Headphones, loudspeakers, personal music players, mobile phones, and other devices.

Personal Audio Assistant

A “Personal Audio Assistant” shall be defined as a portable system capable of interfacing with a communications network, directly or through an intermediate, to transmit and receive audio signals and other data.

Personal Computer

“Personal Computer” shall be defined as any piece of hardware that is an open system capable of compiling, linking, and executing a programming language (such as C/C++, java, etc.).

Personal Music Player

“Personal Music Player” shall be defined as any portable device that implements perceptual audio decoder technology but is a closed system in that users are not generally allowed or able to write software for the device.

Personalized HRTF

A “Personalized HRTF” shall be defined as a set of HRTF data that is measured for a specific Member and unique to that Member. The application of Personalized HRTF data to Audio Content creates, by far, the most convincing Spatial Image for the said Member (Begault et. al. 2001, D. Zotkin, R. Duraiswami, and L. Davis 2002).

Personalized Services

“Personalized Services” shall be defined as services customized to better meet the needs of an individual. Personalized Services include media content (for preview or purchase) related to a user’s preferences, reminders from personal scheduling software, delivery and text-to-speech processing of email, marketing messages, delivery and text-to-speech of stock market information, medication reminders, foreign language instruction, academic instruction, time and date information, and others.

Public Data

“Public Data” shall be defined as data which contains specific and personal information about the registered user of the Personal Audio Assistant. The registered user chooses which portions of their complete Registration Process data they wish to include in this subset. This data becomes distributed to other users who have compliant devices thus allows other users to know specific details of the registered user.

Registration Process

“Registration Process” includes the acquisition of the users preference via a web page. Typically, the process would include the items to be captured: Age, demographics, email, gender, Relative Audiogram, Personal Preferences, banking information, credit card information, wake-up and sleep times, music preferences by genre, artist, preferences for writers and authors, desire to receive advertising, turn-on volume, equalization, email preferences, parental control setup as well as other user-controlled settings.

Relative Audiogram

A “Relative Audiogram” shall be defined as a measured set of data describing a specific individual’s hearing threshold level as a function of frequency. A Relative Audiogram is only an approximate Audiogram, leaving more complete Audiogram analysis to qualified audiologists.

Semi-Personalized HRTF

A “Semi-Personalized HRTF” shall be defined as a set of HRTF data that is selected from a database of known HRTF data as the “best-fit” for a specific user. Semi-Personalized HRTF data is not necessarily unique to one user; however, interpolation and matching algorithms can be employed to modify HRTF data from the database to improve the accuracy of a Semi-Personalized HRTF. The application of Semi-Personalized HRTF data to Audio Content provides a Spatial Image that is improved compared to that of Generic HRTF data, but less effective than that of Personalized HRTF data. The embodiments within speak to a variety of methods for determining the best-fit HRTF data for a particular Member including anthropometrical measurements extracted from photographs and deduction.

Server

A “Server” shall be defined as a system that controls centrally held data and communicates with Clients.

Sonification

“Sonification” shall be defined as the use of non-speech audio to convey information or to aurally perceptualize non-acoustic data. Due to a variety of phenomena involving human cognition, certain types of information can be better or more efficiently conveyed using auditory means than, for example, visual means.

Embodiments of the Present Invention

1. A system for the delivery of Personalized Services to Personal Audio Assistants, the system comprising:
 - a. A Personal Audio Assistant system for presenting Personalized Services to the user as Audio Playback (see embodiment 4-22);
 - b. A Server system for user registration, Personalized Service management, and communication (see embodiment 23);
 - c. A Registration Process for collecting detailed registration information from users, including the information necessary for creating Personalized Services (see embodiment 25);
 - d. A communications protocol (TCP/IP, USB, IEEE 1394, IEEE 802.11, Bluetooth, A2SP, GSM, CDMA, or other) and a communications network (i.e. the Internet, cellular networks) connecting the Personal Audio Assistant to the Server or connecting the Personal Audio Assistant to other Personal Audio Assistants (peer-to-peer behavior);
2. The system of embodiment 1, wherein a Personal Computer acts as an intermediate, connecting to the Server system over a communications network and connecting to the Personal Audio Assistant over a local connection.
3. The system of embodiment 1, wherein a Personal Hearing Damage Intervention System is included (USPTO – 60805985 – Goldstein).

4. A Personal Audio Assistant system included as part of a Headphone system, the system comprising:
- a. A Communications Port supporting some communications protocol enabling communication with the Server system, peer devices, and other capable devices;
 - b. A non-volatile program memory storage system for storing Control Data, dictating system behavior;
 - c. A data memory storage system for storing data and audio content;
 - d. Analog audio input/output and corresponding ADC/DAC;
 - e. Digital audio input/output and a digital audio signal path;
 - f. A user control system allowing the user to adjust the volume of the audio output and control the behavior of the system;
 - g. A user control system allowing the user to purchase the content being auditioned in real time;
 - h. A user control system allowing the user to control, delete, fast forward, volume control, scan, advance, the data stored both stored in memory as well as new streaming data emails and reminders;
 - i. A display system for presenting information to the user(s) visually using any method familiar to those skilled in the art (LED, LCD, or other);
 - j. A display system for presenting information to the user(s) using Earcons and other sound files);
 - k. A speech synthesis system for converting text-to-speech and generating speech signals;

- l. A speech recognition system for converting speech to-text to respond and send emails and to interface with the control language as to provide navigational commands;
 - m. A digital timer system;
 - n. A power supply system in the form of a battery;
 - o. A unique identification number for each Personal Audio Assistant;
 - p. Input Acoustic Transducers;
 - q. Output Acoustic Transducers;
 - r. Audio amplification system;
 - s. Acoustic Isolation Cushions conforming to one of the Ear Mold Styles (CIC, ITC, ITE, or BTE; see definitions) and other elements common to Headphone systems;
 - t. A digital signal processor (DSP) system.
 - u. A CODEC processor capable of improving the perceptual sound quality of the content to be auditioned while governed by delivering the correct SPL dose.
5. The system of embodiment 4, wherein the system is independent of a Headphone array.
6. The system of embodiment 4, wherein the system of embodiment 4 is included and imbedded as part of a Personal Computer system, a Personal Music Player system, a personal monitoring system, an automotive audio system, a home audio system, an avionics audio system, a personal video system, a mobile cell phone system, a personal digital assistant system, a standalone accessory, or an advanced eye-wear system with acoustical transducers.

7. The system of embodiment 4, wherein the various processing needed to derive the intended outcomes are distributed among any combination of a Server system, a Personal Computer system, a Personal Music Player system, a personal monitoring system, an automotive audio system, a home audio system, an avionics audio system, a personal video system, a mobile cell phone system, a personal digital assistant system, a standalone accessory, or an advanced eye-wear system with acoustical transducers.
8. The system of embodiments 4 and/or 5, wherein the Personal Audio Assistant system can exchange audio signals with a mobile phone via the Communications Port, allowing the Personal Audio Assistant to function as a mobile phone accessory.
9. The system of embodiments 4-8, wherein a communications buffer is included; When a network connection is available, the communications buffer uploads stored (Listening Habits Envelope) and stores incoming transmissions (e.g., music, electronic books, and updates to the firmware or operating system) from the Communications Port; The contents of the communications buffer are then transmitted whenever a network connection becomes available.

10. The system of embodiments 4-9, wherein some perceptual audio codec decoding technology is implemented in the DSP, enabling the storage and playback of compressed digital audio formats (e.g., MP3, AAC, FLAC, etc.), the system further comprising:
- a. The system to be compliant and compatible with DRM, FairPlay and other forms of digital content governance.
 - b. A user control system for selecting and playing back audio content stored in memory that operates using any combination of the following methods:
 - i. A button or tactile interface which upon auditioning song can be pressed to order content *in situ*.
 - ii. A button, tactile and/ or voice controlled interface which, when pressed once, to commanded to, activates playback of short audio clips or audio thumbnails of the audio content stored in memory; When the button is pressed again during audio thumbnail playback, the current audio content selection is played in its entirety; The behavior of this interface is similar to the “scan” button interface common in FM/AM radio devices;
 - iii. A button, tactile and/or voice controlled interface that, when pressed or commanded to, skips to the next piece of audio content, which is selected randomly from all available audio content that has a play count equal to or less than the play count of the piece of audio content currently playing; The behavior of this interface is similar to the “shuffle” behavior found in some personal music players;
 - iv. Any interface for browsing audio content storage devices familiar to those skilled in the art;
 - c. A process to allow for increased data memory storage capacity for storing audio content.

11. The system of embodiment 10, wherein the contents of the data memory are encrypted and controlled by the Server system only, prohibiting the end-user from loading unauthorized audio content into the data memory.
12. The system of embodiment 10, wherein the contents of the data memory can be manipulated by the end-user, allowing the user to transfer audio content to the Personal Audio Assistant system from any device capable of interfacing with the communications port; For example, audio content could be transferred to the system from a Personal Music Player or a Personal Computer.
 - a. The system to be compliant and compatible with DRM, FairPlay and other forms of digital content governance.
13. The system of embodiments 4-11, wherein audio content (or other media content) updates are retrieved from the Server system any time a connection is detected by the communications port.
 - a. An acoustical and or visual indicator informing the user when a transfer of data is activated.
14. The system of embodiments 4-11, wherein radio wave transmissions are used to implement some communications protocol and the communications port acts as a radio receiver.
15. The system of embodiments 4-14, wherein the Personal Audio Assistant interfaces with some personal scheduling software through the communications port; The speech synthesis system generates speech-signal reminders corresponding to information from the scheduling software; The digital timer system triggers the presentation of the speech-signal reminders at the appropriate time.

16. The system of embodiments 4-14, wherein the Personal Audio Assistant interfaces with some email platform through the communications port; The speech synthesis system converts the email in text to speech and provides email to the user in aural presentation format. The system further comprising:
- a. A process in the Registration engine allowing the user to optimize their personalization process of incoming emails by associating a specific Earcon with the importance of the incoming email, As such, normal priority email contains a introduction sound announcing to the user the level of importance the sender associated with their email;
 - b. A speech recognition system for converting speech to-text which interfaces with the control language as to provide navigational commands allowing the user to respond and send emails.
17. The system of embodiments 4-15, wherein the communications port system makes use of some wireless communications protocol (802.11, Bluetooth, A2SP, or other) to transmit and receive digital audio data for playback, the system further comprising:
- a. An audio codec to encode and decode digital audio transmissions
 - b. A wireless communications system (802.11, Bluetooth, A2SP etc.) for transmitting and receiving data (digital audio transmissions, Control Data, etc.);
 - c. A method for pairing two or more Personal Audio Assistants through a wireless communications protocol to provide a secure exchange of audio content, data such as the user's Public Data (see embodiments #37.g).
 - d. An audio warning signal or visual display system output that notifies the user anytime a compatible transmission becomes available;

- e. A user control system enabling the user to switch between available compatible transmissions.
18. The system of embodiment 17, wherein the system enables listeners to share digital audio transmissions, the system further comprising:
- a. A method for scanning for available digital audio transmissions within range;
 - b. A user control interface for specifying digital audio transmission behavior;
 - c. A method for employing the system as a relay to other compliant devices; re-broadcasting digital audio transmissions to increase wireless range.
19. The system of embodiment 18, wherein multiple systems are capable of sharing the contents of their program and data memory using the wireless communications protocol.
20. The system of embodiments 4-19, wherein the input Acoustic Transducer is used to record audio content to the data memory storage system, the system further comprising:
- a. An implementation of some perceptual audio codec technology in the DSP, enabling the storage of compressed audio formats (e.g., MP3, AAC, FLAC, etc);
 - b. Increased data memory storage capacity for storing recorded audio content.

21. The system of embodiments 4-20, wherein stereo input Acoustic Transducers are ultimately connected to the audio signal path at the DSP, allowing the user to audition Environmental Audio (e.g., speech or music) and mitigating the need for the user to remove the Headphone apparatus to audition Environmental Audio, the system further comprising:

- a. A stereo pair of input Acoustic Transducers placed close to the user's ear canal input, conforming to one of the Ear Mold Styles (CIC, ITC, ITE, or BTE, see definitions); By mounting the input Acoustic Transducers in a CIC or ITC configuration, spatial-acoustic cues are preserved, creating a spatially-accurate Environmental Audio input signal – essentially a personal binaural recording;
- b. A method for acoustically compensating for the non-linear frequency response characteristics of the Acoustical Isolation Cushions of a given Headphone system by applying corresponding inverse filters to the Environmental Audio input signal at the DSP; With this method, the system acts as a linear-frequency-response hearing protection apparatus (USPTO – 60805985 – Goldstein);
- c. A system for first attenuating Audio Playback and then mixing the Environmental Audio input signals, at a louder volume, with the audio signal path using the DSP, where the system is activated by any combination of the following methods:
 - i. A manual switch to activate / deactivate the system;
 - ii. A speech-detection apparatus to activate the system when speech is detected as the principal component of the Environmental Audio input;
 - iii. A music-detection apparatus to activate the system when music is detected as the principal component of the Environmental Audio input;

- d. A system for active noise reduction, echo cancellation and signal conditioning that can be environmentally customized through the registration process (see embodiment 25) to better meet the user's specific needs (i.e., occupation-related noise cancellation); A typical application would be a special set of noise cancellation parameters tuned to the drilling equipment used by a dentist.

22. The system of embodiment 21, wherein the input Acoustic Transducers are instead mounted within circum-aural, intra-aural BTE, or intra-aural ITE molds (see Ear Mold Style), the system further comprising:

- a. A spatial audio enhancement system for supplementing the spatial-acoustic cues captured by the stereo pair of input Acoustical Transducers to provide improved spatial perception of Environmental Audio using any combination of the following methods:
 - i. The application of Generic, Semi-Personalized, or Personalized HRTF data to the Environmental Audio input signal;
 - ii. The application of binaural enhancement algorithms, familiar to those skilled in the art, to the Environmental Audio input signals;
 - iii. The application of a pinna simulation algorithm to the Environmental Audio input signal;
 - iv. A synthetic pinna apparatus placed just before the stereo input Acoustic Transducers.

23. A Server system for the creation, Registration, management, and delivery of Personalized Services, the system comprising:

- a. A communications system for interfacing with public communication networks to exchange data with Personal Audio Assistants, Client's computer, Mobil phones, PDA or other capable devices;
- b. A database and database management system for storing and retrieving information relating to user Registration, Personalized Services, audio content, Control Data, and other data;
- c. A Registration interface system for collecting, storing, and applying information provided by users;
- d. A method for creating Personalized Services based on user Registration information;
- e. An end-user audio content Lock-Box storage system, providing every registered user access to their purchased media content;
- f. A business-to-business interface system for acquiring audio content with record labels, copyright holders, and other businesses;
- g. An E-tailing system including an electronic transactions system enabling users to purchase content, items offered for sale or pay subscription fees electronically.
- h. An E-Payment system compensating the various copyholders upon purchase of content by user.
- i. A Playlist engine, which acquires the users Registration information, Listening History Envelope and then creates audio playlists, which is optimized for the user preferences and further refinements.
- j. An Email server, which distributes communications to the user and others, regarding marketing data, the status of the user weekly SPL dose, and other information.

24. The system of embodiment 23, wherein machine-learning techniques are employed to better optimize the users' preferences relating to audio content and other media content, the system further comprising:

- a. A method for tracking the purchase history of each user, relating the purchase history to media content preferences, and using the purchase history to make media content recommendations;
- b. A method for examining a user's digital media library, stored on a Personal Computer, Personal Music Player, or Personal Audio Assistant, from the Server system, and relating media content preferences and media content recommendations to the user's digital media library.
- c. A method for examining a user's Listening History Profile.

25. A Registration system for collecting a wide variety information from users, including information necessary for creating Personalized Services, the system comprising:

- a. The Server system of embodiment 23;
- b. An interface system for querying the user to collect registration information including demo graphic's (age, gender) Playback Hardware information, Headphone information, occupational information, home and work locations, medication information, music-related preferences, video-related preferences, and other information;
- c. A method for customizing Control Data based on registration information;
- d. A method for creating Personalized Services based on registration information;

26. The system of embodiments 25, wherein a fast HRTF acquisition process is included as part of the Registration process, the system further comprising a method for the fast acquisition of Semi-Personalized HRTF data via a deduction process, the method comprising:
- a. A database system containing indexed, clustered HRTF data sets;
 - b. An auditory test signal with distinctive spatial characteristics, where two or more distinct sound source locations exist;
 - c. A system for the application of potential HRTF matches to the auditory test signal;
 - d. A feedback system, allowing the user to select the best listening experience from a number of candidate listening experiences, based on the spatial quality perceived in the HRTF-processed auditory test signal.
27. The system of embodiment 26, wherein Personalized HRTF data is measured and used instead of Semi-Personalized HRTF data, by any method familiar to those skilled in the art.
28. The system of embodiment 1, where the user is provided some Personal Audio Assistant (see embodiments 4-22) free-of-charge or at a discount, given the said user agrees to a subscription service commitment to receive Personalized Services for a certain amount of time.

29. The system of embodiments 1-4 and/or 28, wherein as part of the Personalized Services, the user is provided with temporary audio content corresponding to the preferences indicated during the registration process; Further, the user is given the option to purchase said audio content permanently; Otherwise, the audio content is replaced with new audio content from the Server, after a predetermined amount of time or a predetermined number of playback counts, the system comprising:
- a. A Personal Audio Assistant (see embodiments 4-22) with an enhanced user control system, enabling a registered user to purchase media content directly from the Personal Audio Assistant with a button;
 - b. A Personal Audio Assistant (see embodiments 4-22) with an enhanced user control system, enabling a registered user to store a reference to media content that may be purchased by the user at a later time.
30. The system of embodiment 29, wherein video or gaming content is included as well as audio content, the system further comprising:
- a. A Personal Audio Assistant (see embodiments 4-22) with an enhanced visual display system, capable of playing video and/or gaming content.
31. The system of embodiments 1, 28, and/or 30, wherein as part of the Personalized Services, the user receives medication reminders in the form of speech signals, audio signals, text, or graphics on the said user's Personal Audio Assistant; Medication reminders are generated by the Server system based on the user's registration information.

32. The system of embodiments 1, 28, and/or 30, wherein as part of the Personalized Services, the user receives stock market information in the form of speech signals, audio signals, text, or graphics on the said user's Personal Audio Assistant; The stock market information is selected by the Server system based on the user's registration information, the system further comprising:

- a. The user having successfully registered their Personal Audio Assistant with a brokerage firm, or other stock trading engines, the user can then purchase or sell a stock by use of user button or speech command.

33. The system of embodiment 30, wherein the user is able to request specific media content to be transferred temporarily or permanently to the said user's Personal Audio Assistant, the system further comprising:

- a. A interface system operating on the Server allowing users to request specific media content by artist, title, genre, format, keyword search, or other methods familiar to those skilled in the art;
- b. A media content search engine system.

34. The system of embodiment 1,4-22, 30, wherein an Relative Audiogram compensation filter is applied to audio signal path by the digital signal processor, the system either (USPTO – 60805985 – Goldstein):

- a. Retrieves Relative Audiogram compensation information from a remote Server after a registration process (during transmission, the information may include HIPAA compliant encoding);
- b. Or calculates a compensation filter from Relative Audiogram information obtained by the system locally.

35. A method for the acquisition of an individual's Relative Audiogram (US Patent No. 6,840,908 – Edwards, US Patent No. 6,379,314 – Horn)
36. The system of embodiment 4, wherein a Satellite Radio transmitter/receiver (transceiver) is incorporated within the Headphone proper, allowing the user to
- a. Receive XM, Sirius and other broadcasts for playback over the system;
 - b. Select radio stations for playback over the system via the control system of embodiment 4.f, the control system comprising either a single-click tactile interface or the speech-controlled circuitry of embodiment 10.b.ii;
 - c. Store selected portions of such broadcasts in memory for later recall and playback via said control systems;
 - d. Engage a novel commercial-skip feature for attenuating the playback level of suspected sales commercials broadcasts;
 - e. Engage a speech-skip feature for attenuating the playback of speech (e.g., news, announcements, etc.);
37. Walkie-Talkie mode broadcasts input to the system's built-in microphone (cf. embodiment 4.p, whereby the user's speech can be detected by the input acoustic transducer and remotely broadcast
- a. Walkie-Talkie mode receives input via AM/FM broadcasts (as well as digital communications protocols via the Communication System of embodiment 1.d) from a nearby user;
 - b. Walkie-Talkie mode receives input via AM/FM broadcasts (as well as digital communications protocols via the Communication System of embodiment 1.d) from a nearby user

- c. Walkie-Talkie mode receives input via AM/FM broadcasts (as well as digital communications protocols via the Communication System of embodiment 1.d) from a nearby user:
- d. Walkie-Talkie mode allows nearby users to engage in conversation with increased perceptual clarity in noisy environments (e.g., aircraft cockpits), using for example the noise-cancellation system of embodiment 21.d:
- e. Selectively engage and disengage Walkie-Talkie mode using the control system of embodiment 4.f:
- f. Detect other users of the system within a given range;
- g. Alert the user of the system when other detected systems contain certain Public Data and contain a predefined Public Message Key (e.g., "If the detected system belongs to a single male between the ages of 25 and 30 and whose favorite sport is tennis, then broadcast the message, 'I like tennis also; would you like to have coffee?'" or "If the detected system belongs to a user who attended Princeton University, then broadcast the message, 'Go Tigers!'");
- h. The system may use other communications to accomplish this service rather than AM/FM; as such the system may incorporate communications t (TCP/IP, USB, IEEE 1394, IEEE 802.11, Bluetooth, A2SP, GSM, CDMA, or other) and a communications network (i.e. the Internet, cellular networks) connecting the Personal Audio Assistant to other Personal Audio Assistants.
- i. Selectively control the broadcast of public data and public message keys via the control system of embodiment 4.f.

38. The system of embodiment 4, wherein a Sonification algorithm within the Headphone enables auditory display of digitally received data, including for example financial data, news, GPS data, the system further containing
- a. A variety of sonification “themes” selected during the registration process that map requested data (e.g., current average trading price of AAPL stock, the DOW Jones Industrial Index, and the NASDAQ Composite) to corresponding audio content (e.g., the frequency of a sine tone presented in the left ear, the frequency of a sine tone presented in the right ear, and the global amplitude of both sine tones, respectively);
 - b. The system of claim 38-a, wherein the auditory display is synthesized by the onboard Digital Signal Processor;
 - c. The system of claim 38-a, wherein the auditory display is created through the digital audio signal processing effects applied to any other acoustic data the system is capable of reproducing (e.g., terrestrial radio, preprurchased audio content in the user’s digital library, electronic books, etc.); For example, a sudden volume increase in the playback level of a song to which the user was listening can be triggered by a predefined alert condition (e.g., NASDAQ composite has exceeded 2200 points);
 - d. The ability to create themes using a computer program and uploading a file to the Headphone system;
 - e. Interactively switch among themes using the control system of 10.b;
 - f. Engage and disengage the sonification engine.

39. The system of embodiments 4-15, wherein the communications port system makes use of some wireless communications protocol (802.11, Bluetooth, A2SP, or other) to transmit and receive digital audio data for playback, the system further comprising:

- c. A speech recognition system for converting speech to HTML, (Voice Browser), whereby the user may access the Internet, provide navigational commands, perform searches and receive results via the Headphones through a text (HTML)-speech synthesizer.

40. The system of embodiments 4-7 and 9 -38 wherein the Personal Audio Assistant may be totally incorporated with a mobile cell phone, or any portable technology which incorporates any of the following protocols (TCP/IP, USB, IEEE 1394, IEEE 802.11, Bluetooth, A2SP, GSM, CDMA, or others) via a communications network (e.g., the Internet, cellular networks, the system further comprising:

- a. An Acoustic Transducer constructed as part of the mobile cell phone or a series of Acoustic Transducers, which are constructed as part of mobile cell phone;
- b. A communications path incorporated into the mobile cell phone providing for bi-directional communication with a Headphone array;
- c. The incorporation of the mobile cell phone's microphone(s) to act as the Environmental Audio Acoustical Transducer(s);
- d. The incorporation of the mobile cell phone's keyboard or touch sensitive screen to function as a manual input or to complement speech commands and that can act in a way to respond to Personalized Services offered to user.

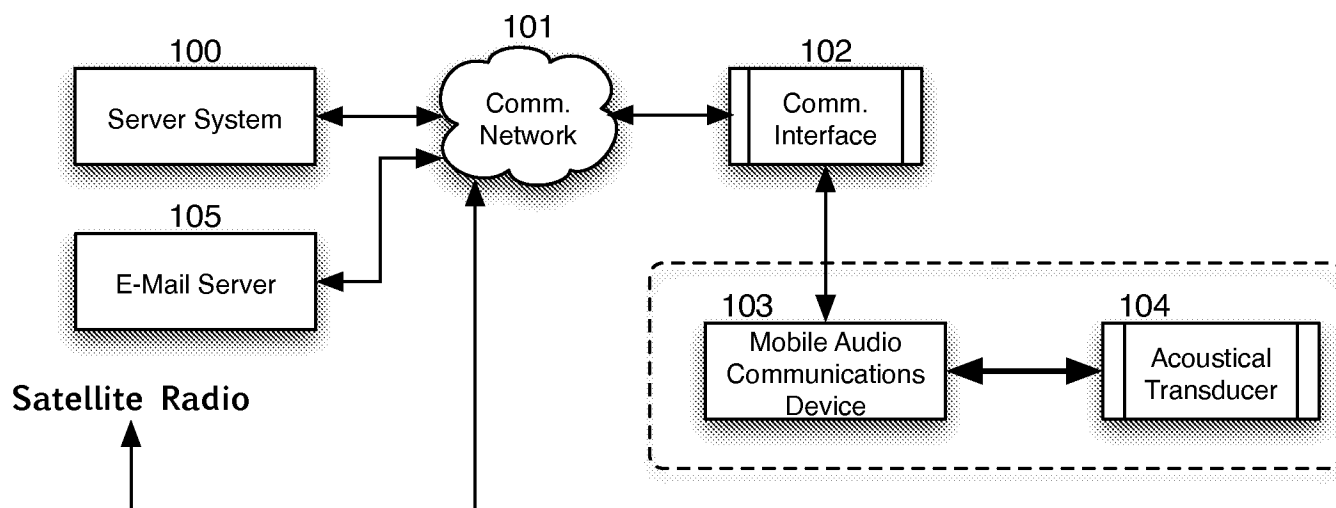


Fig. 1

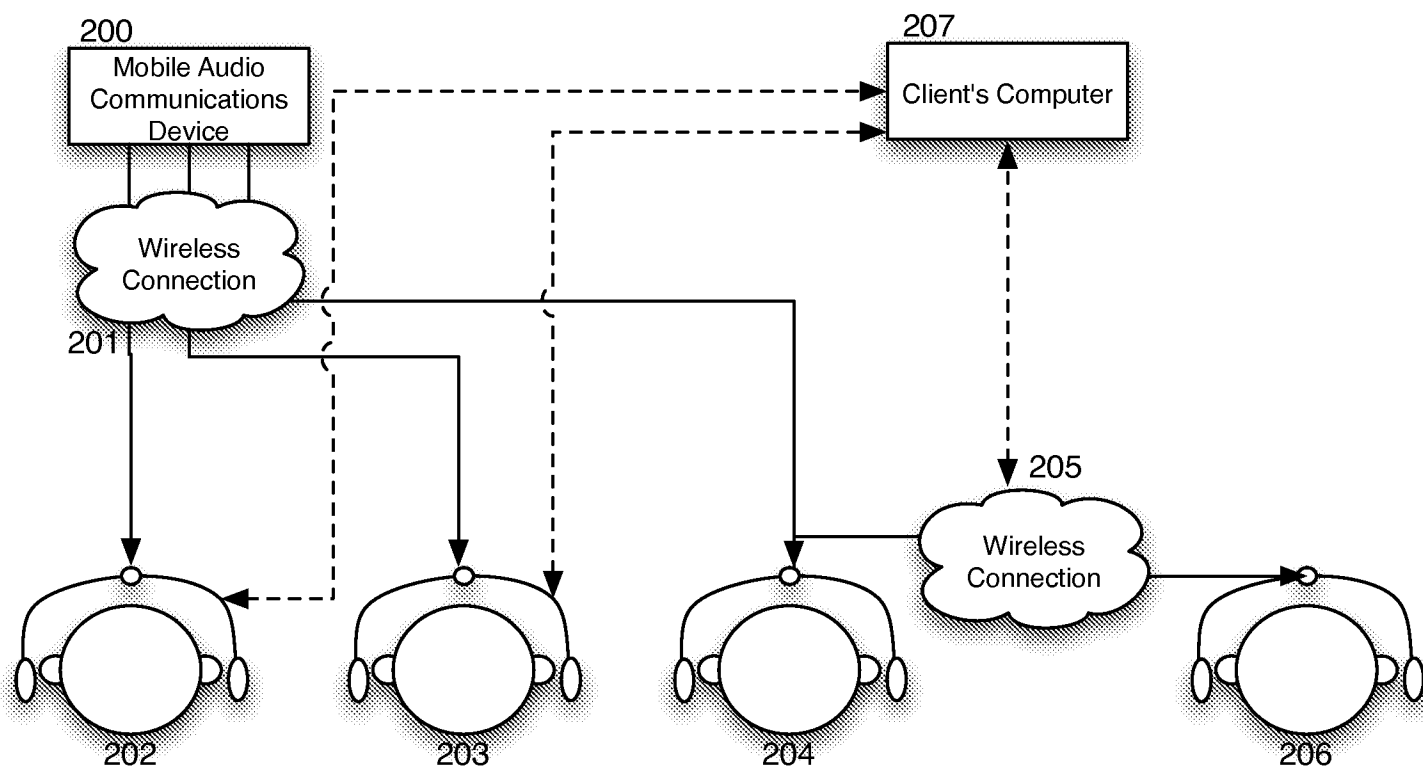


Fig. 2

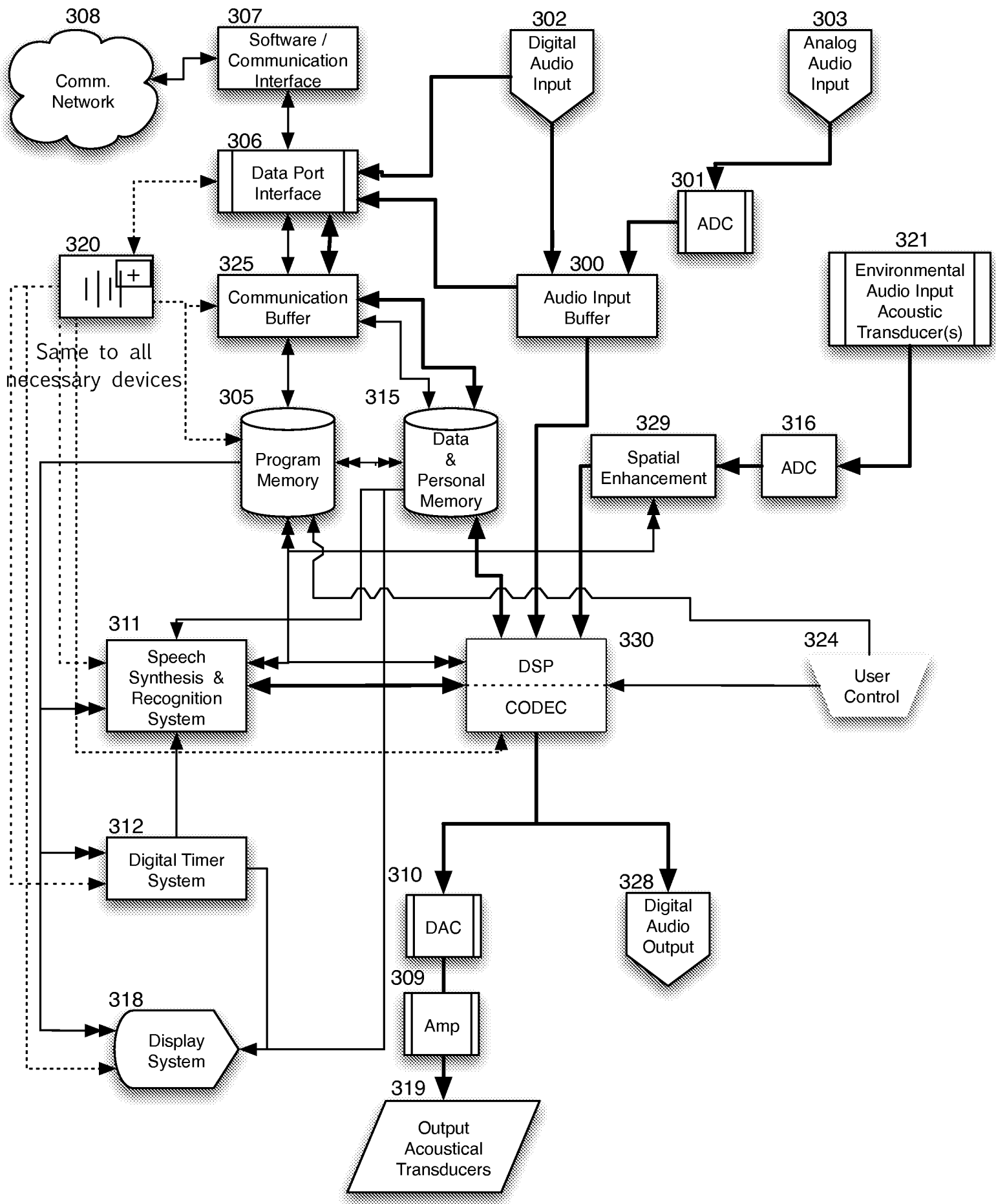


Fig. 3

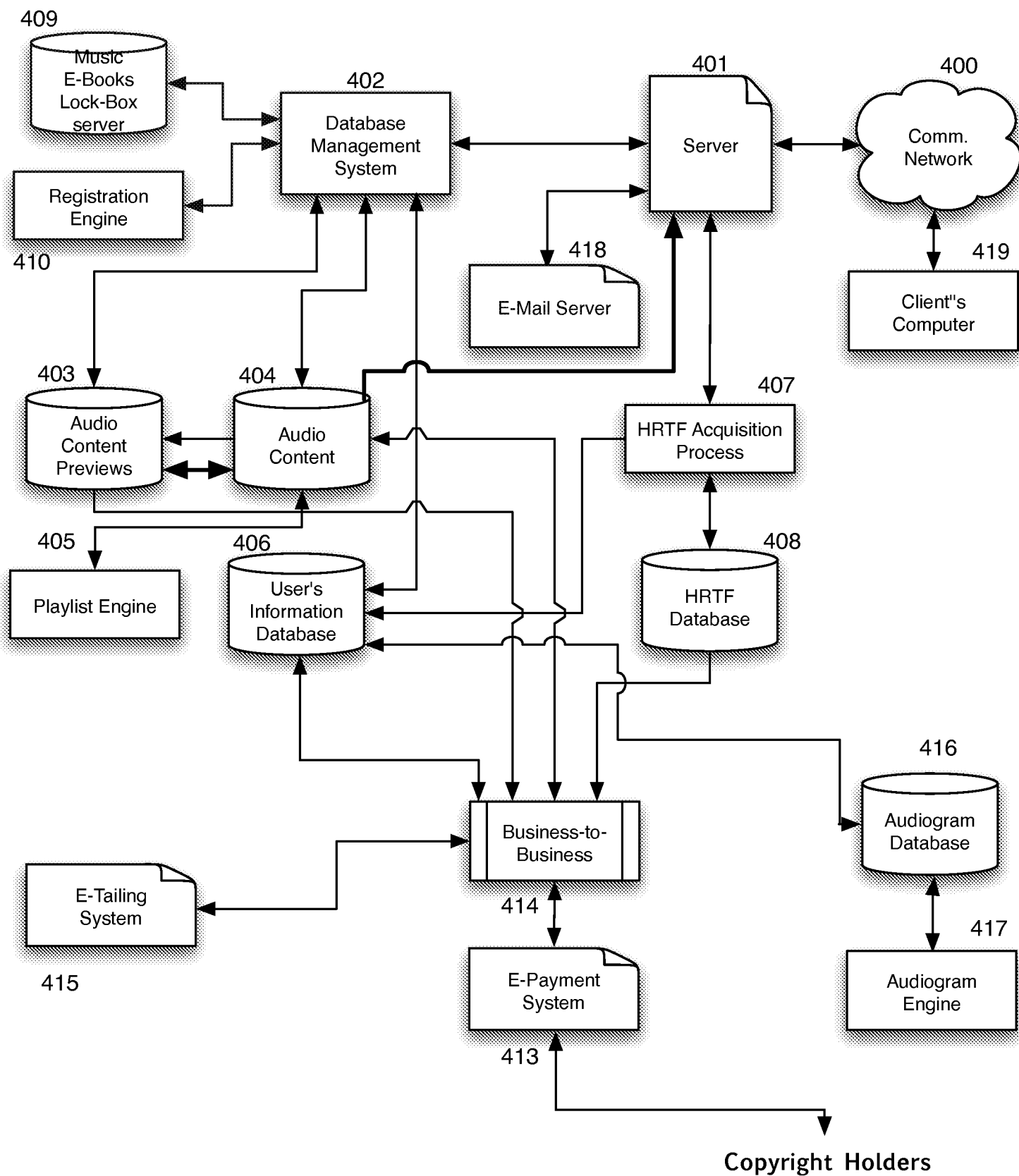


Fig. 4

Electronic Patent Application Fee Transmittal				
Application Number:				
Filing Date:				
Title of Invention:		Personalized Services delivered to a Personal Audio Assistant (PAA)		
First Named Inventor:		Steven Wayne Goldstein		
Filer:		Steven Wayne Goldstein		
Attorney Docket Number:				
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Provisional Filing Fees				
Description	Fee Code	Quantity	Amount	Sub-Total in USD(\$)
Basic Filing:				
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Pages:				
Claims:				
Miscellaneous-Filing:				
Petition:				
Patent-Appeals-and-Interference:				
Post-Allowance-and-Post-Issuance:				
Extension-of-Time:				

Description	Fee Code	Quantity	Amount	Sub-Total in USD(\$)
Miscellaneous:				
Total in USD (\$)				100

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Document Number	Document Description	File Name	File Size(Bytes)	Multi Part	Pages
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1	Application Data Sheet	US_ADS_Form_SB_14.pdf	1082324	no	4
Warnings:					
Information:					
2	Abstract	PAA_Abtract.pdf	84888	no	4
Warnings:					
Information:					
3	Specification	PAA_Definitions.pdf	103365	no	7
Warnings:					
Information:					
4	Specification	PAA_Embodiments.pdf	157991	no	19
Warnings:					
Information:					
5	Drawings	PAA_Drawing.pdf	382156	no	3
Warnings:					
Information:					
6	Fee Worksheet (PTO-875)	fee-info.pdf	8088	no	2
Warnings:					
Information:					
Total Files Size (in bytes):			1818812		
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