

Doc code: IDS

Doc description: Information Disclosure Statement (IDS) Filed

PTO/SB/08a (02-18)

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U.S. Patent and Trademark Office; U.S. DEPARTMENT OF COMMERCE

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INFORMATION DISCLOSURE STATEMENT BY APPLICANT (Not for submission under 37 CFR 1.99)	Application Number	
	Filing Date	
	First Named Inventor	Goldstein et al.
	Art Unit	
	Examiner Name	
	Attorney Docket Number	CONT-166716889

U.S.PATENTS						Remove
Examiner Initial*	Cite No	Patent Number	Kind Code ¹	Issue Date	Name of Patentee or Applicant of cited Document	Pages, Columns, Lines where Relevant Passages or Relevant Figures Appear
	1	9129291		2015-09-08	Goldstein; Steven	
	2	10529325		2020-01-07	Goldstein; Steven	
	3	6661901		2003-12-09	Svean; Jarle	
	4	6754359		2004-06-22	Svean; Jarle	
	5	8208644		2012-06-26	Goldstein; Steven W.	
	6	8315400		2012-11-20	Goldstein; Steven Wayne	
	7	9781530		2017-10-03	Usher; John	
	8	10097149		2018-10-09	Voix; Jeremie	

INFORMATION DISCLOSURE STATEMENT BY APPLICANT (Not for submission under 37 CFR 1.99)	Application Number		
	Filing Date		
	First Named Inventor	Goldstein et al.	
	Art Unit		
	Examiner Name		
	Attorney Docket Number	CONT-166716889	

	9	9191740		2015-11-17	McIntosh et al.	
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	1	20050254667		2005-11-17	Michael, Kevin	
	2	20080107286		2008-05-08	Nakajima, Kaori	
	3	20090220096		2009-09-03	Usher, John	
	4	20130218560		2013-08-22	Hsiao, Jen-Po	
	5	20180176696		2020-02-25	Voigt Pedersen, Soren Christian	
	6	20040179694		2004-09-16	Kenneth Alley	

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INFORMATION DISCLOSURE STATEMENT BY APPLICANT (Not for submission under 37 CFR 1.99)	Application Number		
	Filing Date		
	First Named Inventor	Goldstein et al.	
	Art Unit		
	Examiner Name		
	Attorney Docket Number	CONT-166716889	

	1	CN101227759	CN		2008-07-23		
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NON-PATENT LITERATURE DOCUMENTS

Examiner Initials*	Cite No	Include name of the author (in CAPITAL LETTERS), title of the article (when appropriate), title of the item (book, magazine, journal, serial, symposium, catalog, etc), date, pages(s), volume-issue number(s), publisher, city and/or country where published.	T ⁵
	1		

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EXAMINER SIGNATURE

Examiner Signature		Date Considered	
--------------------	--	-----------------	--

*EXAMINER: Initial if reference considered, whether or not citation is in conformance with MPEP 609. Draw line through a citation if not in conformance and not considered. Include copy of this form with next communication to applicant.

¹ See Kind Codes of USPTO Patent Documents at www.USPTO.GOV or MPEP 901.04. ² Enter office that issued the document, by the two-letter code (WIPO Standard ST.3). ³ For Japanese patent documents, the indication of the year of the reign of the Emperor must precede the serial number of the patent document. ⁴ Kind of document by the appropriate symbols as indicated on the document under WIPO Standard ST.16 if possible. ⁵ Applicant is to place a check mark here if English language translation is attached.

INFORMATION DISCLOSURE STATEMENT BY APPLICANT (Not for submission under 37 CFR 1.99)	Application Number		
	Filing Date		
	First Named Inventor	Goldstein et al.	
	Art Unit		
	Examiner Name		
	Attorney Docket Number	CONT-166716889	

CERTIFICATION STATEMENT

Please see 37 CFR 1.97 and 1.98 to make the appropriate selection(s):

That each item of information contained in the information disclosure statement was first cited in any communication from a foreign patent office in a counterpart foreign application not more than three months prior to the filing of the information disclosure statement. See 37 CFR 1.97(e)(1).

OR

☐ That no item of information contained in the information disclosure statement was cited in a communication from a foreign patent office in a counterpart foreign application, and, to the knowledge of the person signing the certification after making reasonable inquiry, no item of information contained in the information disclosure statement was known to any individual designated in 37 CFR 1.56(c) more than three months prior to the filing of the information disclosure statement. See 37 CFR 1.97(e)(2).

See attached certification statement.

The fee set forth in 37 CFR 1.17 (p) has been submitted herewith.

☒ A certification statement is not submitted herewith.

SIGNATURE

A signature of the applicant or representative is required in accordance with CFR 1.33, 10.18. Please see CFR 1.4(d) for the form of the signature.

Signature	/John P. Keady/	Date (YYYY-MM-DD)	2021-03-16
Name/Print	John P. Keady	Registration Number	56389

This collection of information is required by 37 CFR 1.97 and 1.98. The information is required to obtain or retain a benefit by the public which is to file (and by the USPTO to process) an application. Confidentiality is governed by 35 U.S.C. 122 and 37 CFR 1.14. This collection is estimated to take 1 hour to complete, including gathering, preparing and submitting the completed application form to the USPTO. Time will vary depending upon the individual case. Any comments on the amount of time you require to complete this form and/or suggestions for reducing this burden, should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, U.S. Department of Commerce, P.O. Box 1450, Alexandria, VA 22313-1450. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. **SEND TO: Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450.**

Privacy Act Statement

The Privacy Act of 1974 (P.L. 93-579) requires that you be given certain information in connection with your submission of the attached form related to a patent application or patent. Accordingly, pursuant to the requirements of the Act, please be advised that: (1) the general authority for the collection of this information is 35 U.S.C. 2(b)(2); (2) furnishing of the information solicited is voluntary; and (3) the principal purpose for which the information is used by the U.S. Patent and Trademark Office is to process and/or examine your submission related to a patent application or patent. If you do not furnish the requested information, the U.S. Patent and Trademark Office may not be able to process and/or examine your submission, which may result in termination of proceedings or abandonment of the application or expiration of the patent.

The information provided by you in this form will be subject to the following routine uses:

1. The information on this form will be treated confidentially to the extent allowed under the Freedom of Information Act (5 U.S.C. 552) and the Privacy Act (5 U.S.C. 552a). Records from this system of records may be disclosed to the Department of Justice to determine whether the Freedom of Information Act requires disclosure of these records.
2. A record from this system of records may be disclosed, as a routine use, in the course of presenting evidence to a court, magistrate, or administrative tribunal, including disclosures to opposing counsel in the course of settlement negotiations.
3. A record in this system of records may be disclosed, as a routine use, to a Member of Congress submitting a request involving an individual, to whom the record pertains, when the individual has requested assistance from the Member with respect to the subject matter of the record.
4. A record in this system of records may be disclosed, as a routine use, to a contractor of the Agency having need for the information in order to perform a contract. Recipients of information shall be required to comply with the requirements of the Privacy Act of 1974, as amended, pursuant to 5 U.S.C. 552a(m).
5. A record related to an International Application filed under the Patent Cooperation Treaty in this system of records may be disclosed, as a routine use, to the International Bureau of the World Intellectual Property Organization, pursuant to the Patent Cooperation Treaty.
6. A record in this system of records may be disclosed, as a routine use, to another federal agency for purposes of National Security review (35 U.S.C. 181) and for review pursuant to the Atomic Energy Act (42 U.S.C. 218(c)).
7. A record from this system of records may be disclosed, as a routine use, to the Administrator, General Services, or his/her designee, during an inspection of records conducted by GSA as part of that agency's responsibility to recommend improvements in records management practices and programs, under authority of 44 U.S.C. 2904 and 2906. Such disclosure shall be made in accordance with the GSA regulations governing inspection of records for this purpose, and any other relevant (i.e., GSA or Commerce) directive. Such disclosure shall not be used to make determinations about individuals.
8. A record from this system of records may be disclosed, as a routine use, to the public after either publication of the application pursuant to 35 U.S.C. 122(b) or issuance of a patent pursuant to 35 U.S.C. 151. Further, a record may be disclosed, subject to the limitations of 37 CFR 1.14, as a routine use, to the public if the record was filed in an application which became abandoned or in which the proceedings were terminated and which application is referenced by either a published application, an application open to public inspections or an issued patent.
9. A record from this system of records may be disclosed, as a routine use, to a Federal, State, or local law enforcement agency, if the USPTO becomes aware of a violation or potential violation of law or regulation.

INFORMATION DISCLOSURE STATEMENT LIST		Serial No.	Unknown	
		Filing Date	16 Mar. 2021	
		First Inventor	Goldstein et al.	
		Group Art Unit	Unknown	
		Examiner	Unknown	
		Docket No.	CONT-16671689	
U.S. PATENT DOCUMENTS				
Examiner's Initials	Cite No.	Document No.	Date	Inventors
	1.	3902155	1975-08-26	Young
	2.	4539440	1985-09-03	Sciarra
	3.	4731850	1988-03-15	Levitt et al.
	4.	5033090	1991-07-16	Weinrich
	5.	5734961	1998-03-31	Castille
	6.	5894113	1999-04-13	Wingate
	7.	6469615	2002-10-22	Kady et al.
	8.	6606596	2003-08-12	Zirngibl et al.
	9.	8126159	2012-02-28	Goose et al.
	10.	2002/0129056	2002-09-12	Conant et al.
	11.	2002/0183648	2002-12-05	Hou
	12.	2003/0185403	2003-10-02	Sibbald
	13.	2005/0015606	2005-01-20	Blamires et al.
	14.	2005/0049492	2005-03-03	Sweeney et al.
	15.	2005/0098681	2005-05-12	Berson et al.
	16.	2005/0105750	2005-05-19	Frohlich
	17.	2005/0144132	2005-06-30	Lin
	18.	2005/0251224	2005-11-10	Berg
	19.	2006/0158956	2006-07-20	Laugharn et al.
	20.	2006/0233395	2006-10-19	Orten
	21.	2006/0262935	2006-11-23	Goose et al.
	22.	2007/0098195	2007-05-03	Holmes
	23.	2008/0091605	2008-04-17	Hughes et al.
	24.	2008/0120115	2008-05-22	Mao
	25.	2008/0162133	2008-07-03	Couper et al.
	26.	2008/0165980	2008-07-10	Pavlovic
	27.	2008/0177998	2008-07-24	Apsangi et al.
	28.	2008/0178088	2008-07-24	Goldstein et al.
	29.	2008/0267422	2008-10-30	Cox
	30.	2009/0110223	2009-04-30	Semcken
	31.	2009/0183560	2009-07-23	Henne et al.
	32.	2009/0190767	2009-07-30	Aaron et al.
	33.	2009/0204243	2009-08-13	Marwaha et al.
	34.	2010/0002897	2010-01-07	Keady

INFORMATION DISCLOSURE STATEMENT LIST				
			Serial No.	Unknown
			Filing Date	Unknown
			First Inventor	Goldstein et al.
			Group Art Unit	Unknown
			Examiner	Unknown
			Docket No.	CONT-16671689
U.S. PATENT DOCUMENTS				
Examiner's Initials	Cite No.	Document No.	Date	Inventors
	35.	2010/0033313	2010-02-11	Keady et al.
	36.	2010/0232634	2010-09-16	Boldt
	37.	2012/0021732	2012-01-26	Lam

FOREIGN PATENT DOCUMENTS						
Examiner's Initials	Cite No.	Foreign Doc. No.	Country	Publication Date	Applicant	Translation
	38.	1104155	EP	2001-05-30	Phone Com Inc.	
	39.	WO 00/28721	WO	2000-05-18	Ericsson Inc.	
	40.	WO 08014482	WO	2008-01-31	Personics Holdings	
	41.	WO 08061260	WO	2008-05-22	Personics Holdings	
	42.	WO 08153589	WO	2008-12-18	Personics Holdings	

NON-PATENT LITERATURE		
Examiner's Initials	Cite No.	Non-Patent Citations (Include Author, Title, Publisher, Relevant Pages, Date and Place of Publication)
	43.	Anonymous, Choose your flavor: Sound ID launches Two new Bluetooth Headsets with Personalized Sound, Business Wire, New York: Oct. 16, 2006. pp. 1-4. (ProQuest Doc ID 114619641)
	44.	PCT International Search Report for PCT Application No. PCT/US07/74641 dated Jul. 17, 2008.
	45.	PCT International Search Report for PCT Application No. PCT/US07/85134 dated Jun. 12, 2008
	46.	PCT Written Opinion for PCT Application No. PCT/US07/85134 dated Jun. 12, 2008.
	47.	PCT Written Opinion for PCT Application No. PCT/US08/88417 dated Apr. 9, 2009
	48.	Patent Cooperation Treaty, "International Search Report," issued in International Patent Application No. PCT/US09/57751, by U.S. Search Authority, dated Nov. 6, 2009, document of 2 pages

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

APPLICATION NO. : UNKNOWN CONFIRMATION NO. unknown
APPLICATION OF : Goldstein, et al.
DATE FILED : 16 Mar. 2021
EXAMINER : UNKNOWN
TC/A.U. : UNKNOWN
DOCKET : CONT-16671689
TITLE : PERSONALIZED SOUND MANAGEMENT AND METHOD

Information Disclosure Statement

Pursuant to the Duty to Disclose under 37 C.F.R. §1.56, the references cited on the accompanying form PTO/SB/08a are hereby brought to the attention of the Examiner. Because the form PTO/SB/08a does not include a certification statement, the following is provided.

This Information Disclosure Statement is being filed before the mailing date of a first Office Action on the merits, or before the mailing of a first Office Action.

Applicant respectfully requests the Examiner's consideration of the references cited therein and entry thereof into the record of this application.

Respectfully submitted,

Respectfully submitted,
TECHIYA LLC

Date: March 16, 2021

_____/John P. Keady/
John P. Keady
Assistant General Counsel: Intellectual Property
and Chief Technical Officer
Staton Techiya LLC
Reg. No. 56,389
571-606-1291

Electronic Patent Application Fee Transmittal				
Application Number:				
Filing Date:				
Title of Invention:		PERSONALIZED SOUND MANAGEMENT AND METHOD		
First Named Inventor/Applicant Name:		Steven Goldstein		
Filer:		John Patrick Keady		
Attorney Docket Number:		CONT-16671689		
Filed as Small Entity				
Filing Fees for Utility under 35 USC 111(a)				
Description	Fee Code	Quantity	Amount	Sub-Total in USD(\$)
Basic Filing:				
UTILITY FILING FEE (ELECTRONIC FILING)	4011	1	80	80
UTILITY SEARCH FEE	2111	1	350	350
UTILITY EXAMINATION FEE	2311	1	400	400
Pages:				
Claims:				
Miscellaneous-Filing:				
Petition:				
Patent-Appeals-and-Interference:				

Description	Fee Code	Quantity	Amount	Sub-Total in USD(\$)
Post-Allowance-and-Post-Issuance:				
Extension-of-Time:				
Miscellaneous:				
Total in USD (\$)				830

Electronic Acknowledgement Receipt	
EFS ID:	42200551
Application Number:	17203731
International Application Number:	
Confirmation Number:	7004
Title of Invention:	PERSONALIZED SOUND MANAGEMENT AND METHOD
First Named Inventor/Applicant Name:	Steven Goldstein
Customer Number:	150139
Filer:	John Patrick Keady
Filer Authorized By:	
Attorney Docket Number:	CONT-16671689
Receipt Date:	16-MAR-2021
Filing Date:	
Time Stamp:	23:37:49
Application Type:	Utility under 35 USC 111(a)

Payment information:

Submitted with Payment	yes
Payment Type	CARD
Payment was successfully received in RAM	\$830
RAM confirmation Number	E20213FN39022632
Deposit Account	
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The Director of the USPTO is hereby authorized to charge indicated fees and credit any overpayment as follows:	

File Listing:					
Document Number	Document Description	File Name	File Size(Bytes)/ Message Digest	Multi Part /.zip	Pages (if appl.)
1	Application Data Sheet	WebADS.pdf	136637	no	8
			5fd5c08b9e55524a0f3bc2392583d4d846cbe8b5		
Warnings:					
Information:					
2	Abstract	CONT-16671689_abstract.pdf	76513	no	1
			60cbf93122f15c755f48e6b889de4dfa218be32e		
Warnings:					
Information:					
3	Claims	CONT-16671689_claims.pdf	100565	no	2
			0d31a91b8060d4e6a78db8fa4fe4abcb93277f8d		
Warnings:					
Information:					
4	Drawings-other than black and white line drawings	CONT-16671689_figures.pdf	809208	no	15
			98e8ce735eca0cc36e3bc7393599c3d0c60aa565		
Warnings:					
Information:					
5	Oath or Declaration filed	CONT-16671689_oath.pdf	476122	no	3
			6a8498a2dd149dfa136d12b590b7844dfeeb0fc		
Warnings:					
Information:					
6	Specification	CONT-16671689_specification.pdf	218580	no	25
			b5e669f75879c64b52101e62c217ce61101c142a		
Warnings:					
Information:					

7	Transmittal Letter	CONT-16671689_trns-ltr.pdf	120324	no	1
			c0a7081e2906a0bcedaf20a5a9b379ea1bc57831		
Warnings:					
Information:					
8	Information Disclosure Statement (IDS) Form (SB08)	CONT-166716889-IDS_1.pdf	1035091	no	5
			a7be675158c3a1826cc5201c11d34c7953439a32		
Warnings:					
Information:					
9	Information Disclosure Statement (IDS) Form (SB08)	CONT-16671689-IDS_2.pdf	215234	no	1
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Warnings:					
Information:					
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10	Information Disclosure Statement (IDS) Form (SB08)	CONT-16671689-IDS_3.pdf	218280	no	1
			40238e2f9abbbe4b6466fca485e74c0208d2f8f5		
Warnings:					
Information:					
This is not an USPTO supplied IDS fillable form					
11	Transmittal Letter	CONT-16671689_trns-ltr-IDS.pdf	104546	no	1
			a6434936aa706f586e23d2a7df51cb1d4bb5fc29		
Warnings:					
Information:					
12	Fee Worksheet (SB06)	fee-info.pdf	35124	no	2
			4732496c49a75d73009983ccac701cb917dccb1fb		
Warnings:					
Information:					
Total Files Size (in bytes):			3546224		

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

New Applications Under 35 U.S.C. 111

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

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

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

New International Application Filed with the USPTO as a Receiving Office

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

Application Data Sheet 37 CFR 1.76		Attorney Docket Number	CONT-16671689
		Application Number	
Title of Invention	PERSONALIZED SOUND MANAGEMENT AND METHOD		
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.			

Secrecy Order 37 CFR 5.2:

☐	Portions or all of the application associated with this Application Data Sheet may fall under a Secrecy Order pursuant to 37 CFR 5.2 (Paper filers only. Applications that fall under Secrecy Order may not be filed electronically.)
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Inventor Information:

Inventor 1					
Legal Name					
Prefix	Given Name	Middle Name	Family Name	Suffix	
	Steven		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
Mailing Address of Inventor:					
Address 1		16390 Maddalena Place			
Address 2					
City	Delray Beach	State/Province	FL		
Postal Code	33446	Country ⁱ	US		
Inventor 2					
Legal Name					
Prefix	Given Name	Middle Name	Family Name	Suffix	
	John	P.	Keady		
Residence Information (Select One) ☒ US Residency ☐ Non US Residency ☐ Active US Military Service					
City	Fairfax Station	State/Province	VA	Country of Residence ⁱ	US
Mailing Address of Inventor:					
Address 1		8138 Crestridge Rd.			
Address 2					
City	Fairfax Station	State/Province	VA		
Postal Code	22039	Country ⁱ	US		
All Inventors Must Be Listed - Additional Inventor Information blocks may be generated within this form by selecting the Add button.					Add

Correspondence Information:

Application Data Sheet 37 CFR 1.76		Attorney Docket Number	CONT-16671689
		Application Number	
Title of Invention	PERSONALIZED SOUND MANAGEMENT AND METHOD		

Enter either Customer Number or complete the Correspondence Information section below.
For further information see 37 CFR 1.33(a).

☐ **An Address is being provided for the correspondence information of this application.**

Customer Number	150139		
Email Address	ip@akerman.com	Add Email	Remove Email

Application Information:

Title of the Invention	PERSONALIZED SOUND MANAGEMENT AND METHOD		
Attorney Docket Number	CONT-16671689	Small Entity Status Claimed	☒
Application Type	Nonprovisional		
Subject Matter	Utility		
Total Number of Drawing Sheets (if any)	15	Suggested Figure for Publication (if any)	14

Filing By Reference:

Only complete this section when filing an application by reference under 35 U.S.C. 111(c) and 37 CFR 1.57(a). Do not complete this section if application papers including a specification and any drawings are being filed. Any domestic benefit or foreign priority information must be provided in the appropriate section(s) below (i.e., "Domestic Benefit/National Stage Information" and "Foreign Priority Information").

For the purposes of a filing date under 37 CFR 1.53(b), the description and any drawings of the present application are replaced by this reference to the previously filed application, subject to conditions and requirements of 37 CFR 1.57(a).

Application number of the previously filed application	Filing date (YYYY-MM-DD)	Intellectual Property Authority or Country

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 and will not** be the subject of an application filed in another country, or under a multilateral international agreement, that requires publication at eighteen months after filing.

Representative Information:

Representative information should be provided for all practitioners having a power of attorney in the application. Providing this information in the Application Data Sheet does not constitute a power of attorney in the application (see 37 CFR 1.32). Either enter Customer Number or complete the Representative Name section below. If both sections are completed the customer Number will be used for the Representative Information during processing.

Please Select One:	☒ Customer Number	☐ US Patent Practitioner	☐ Limited Recognition (37 CFR 11.9)
Customer Number	150139		

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Application Data Sheet 37 CFR 1.76		Attorney Docket Number	CONT-16671689
		Application Number	
Title of Invention	PERSONALIZED SOUND MANAGEMENT AND METHOD		

Prefix	Given Name	Middle Name	Family Name	Suffix	Remove
Registration Number					
Prefix	Given Name	Middle Name	Family Name	Suffix	Remove
Registration Number					
Additional Representative Information blocks may be generated within this form by selecting the Add button.					

Domestic Benefit/National Stage Information:

This section allows for the applicant to either claim benefit under 35 U.S.C. 119(e), 120, 121, 365(c), or 386(c) or indicate National Stage entry from a PCT application. Providing benefit claim 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.

When referring to the current application, please leave the "Application Number" field blank.

Prior Application Status		Pending		Remove	
Application Number	Continuity Type	Prior Application Number	Filing or 371(c) Date (YYYY-MM-DD)		
	Continuation of	16671689	2019-11-01		
Prior Application Status		Patented		Remove	
Application Number	Continuity Type	Prior Application Number	Filing Date (YYYY-MM-DD)	Patent Number	Issue Date (YYYY-MM-DD)
16671689	Continuation of	14846994	2015-09-07	10529325	2020-01-07
Prior Application Status		Patented		Remove	
Application Number	Continuity Type	Prior Application Number	Filing Date (YYYY-MM-DD)	Patent Number	Issue Date (YYYY-MM-DD)
14846994	Continuation of	12560097	2009-09-15	9129291	2015-09-08
Prior Application Status		Pending		Remove	
Application Number	Continuity Type	Prior Application Number	Filing or 371(c) Date (YYYY-MM-DD)		
12560097	Claims benefit of provisional	61098914	2008-09-22		
Additional Domestic Benefit/National Stage Data may be generated within this form by selecting the Add button.					

Foreign Priority Information:

Application Data Sheet 37 CFR 1.76		Attorney Docket Number	CONT-16671689
		Application Number	
Title of Invention	PERSONALIZED SOUND MANAGEMENT AND METHOD		

This section allows for the applicant to claim priority to a foreign application. 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. When priority is claimed to a foreign application that is eligible for retrieval under the priority document exchange program (PDX) the information will be used by the Office to automatically attempt retrieval pursuant to 37 CFR 1.55(i)(1) and (2). Under the PDX program, applicant bears the ultimate responsibility for ensuring that a copy of the foreign application is received by the Office from the participating foreign intellectual property office, or a certified copy of the foreign priority application is filed, within the time period specified in 37 CFR 1.55(g)(1).

Application Number	Country ¹	Filing Date (YYYY-MM-DD)	Access Code ¹ (if applicable)
	US		

Additional Foreign Priority Data may be generated within this form by selecting the **Add** button.

Statement under 37 CFR 1.55 or 1.78 for AIA (First Inventor to File) Transition Applications

☐ This application (1) claims priority to or the benefit of an application filed before March 16, 2013 and (2) also contains, or contained at any time, a claim to a claimed invention that has an effective filing date on or after March 16, 2013.

NOTE: By providing this statement under 37 CFR 1.55 or 1.78, this application, with a filing date on or after March 16, 2013, will be examined under the first inventor to file provisions of the AIA.

Application Data Sheet 37 CFR 1.76		Attorney Docket Number	CONT-16671689
		Application Number	
Title of Invention	PERSONALIZED SOUND MANAGEMENT AND METHOD		

Authorization or Opt-Out of Authorization to Permit Access:

When this Application Data Sheet is properly signed and filed with the application, applicant has provided written authority to permit a participating foreign intellectual property (IP) office access to the instant application-as-filed (see paragraph A in subsection 1 below) and the European Patent Office (EPO) access to any search results from the instant application (see paragraph B in subsection 1 below).

Should applicant choose not to provide an authorization identified in subsection 1 below, applicant **must opt-out** of the authorization by checking the corresponding box A or B or both in subsection 2 below.

NOTE: This section of the Application Data Sheet is **ONLY** reviewed and processed with the **INITIAL** filing of an application. After the initial filing of an application, an Application Data Sheet cannot be used to provide or rescind authorization for access by a foreign IP office(s). Instead, Form PTO/SB/39 or PTO/SB/69 must be used as appropriate.

1. Authorization to Permit Access by a Foreign Intellectual Property Office(s)

A. Priority Document Exchange (PDX) - Unless box A in subsection 2 (opt-out of authorization) is checked, the undersigned hereby **grants the USPTO authority** to provide the European Patent Office (EPO), the Japan Patent Office (JPO), the Korean Intellectual Property Office (KIPO), the State Intellectual Property Office of the People's Republic of China (SIPO), the World Intellectual Property Organization (WIPO), and any other foreign intellectual property office participating with the USPTO in a bilateral or multilateral priority document exchange agreement in which a foreign application claiming priority to the instant patent application is filed, access to: (1) the instant patent application-as-filed and its related bibliographic data, (2) any foreign or domestic application to which priority or benefit is claimed by the instant application and its related bibliographic data, and (3) the date of filing of this Authorization. See 37 CFR 1.14(h)(1).

B. Search Results from U.S. Application to EPO - Unless box B in subsection 2 (opt-out of authorization) is checked, the undersigned hereby **grants the USPTO authority** to provide the EPO access to the bibliographic data and search results from the instant patent application when a European patent application claiming priority to the instant patent application is filed. See 37 CFR 1.14(h)(2).

The applicant is reminded that the EPO's Rule 141(1) EPC (European Patent Convention) requires applicants to submit a copy of search results from the instant application without delay in a European patent application that claims priority to the instant application.

2. Opt-Out of Authorizations to Permit Access by a Foreign Intellectual Property Office(s)

☐ A. Applicant **DOES NOT** authorize the USPTO to permit a participating foreign IP office access to the instant application-as-filed. If this box is checked, the USPTO will not be providing a participating foreign IP office with any documents and information identified in subsection 1A above.

☐ B. Applicant **DOES NOT** authorize the USPTO to transmit to the EPO any search results from the instant patent application. If this box is checked, the USPTO will not be providing the EPO with search results from the instant application.

NOTE: Once the application has published or is otherwise publicly available, the USPTO may provide access to the application in accordance with 37 CFR 1.14.

Application Data Sheet 37 CFR 1.76		Attorney Docket Number	CONT-16671689
		Application Number	
Title of Invention	PERSONALIZED SOUND MANAGEMENT AND METHOD		

Applicant Information:

Providing assignment information in this section does not substitute for compliance with any requirement of part 3 of Title 37 of CFR to have an assignment recorded by the Office.

Applicant 1

If the applicant is the inventor (or the remaining joint inventor or inventors under 37 CFR 1.45), this section should not be completed. The information to be provided in this section is the name and address of the legal representative who is the applicant under 37 CFR 1.43; or the name and address of the assignee, person to whom the inventor is under an obligation to assign the invention, or person who otherwise shows sufficient proprietary interest in the matter who is the applicant under 37 CFR 1.46. If the applicant is an applicant under 37 CFR 1.46 (assignee, person to whom the inventor is obligated to assign, or person who otherwise shows sufficient proprietary interest) together with one or more joint inventors, then the joint inventor or inventors who are also the applicant should be identified in this section.

Clear

- ☐ Assignee
 ☐ Legal Representative under 35 U.S.C. 117
 ☐ Joint Inventor
- ☒ Person to whom the inventor is obligated to assign.
 ☐ Person who shows sufficient proprietary interest

If applicant is the legal representative, indicate the authority to file the patent application, the inventor is:

Name of the Deceased or Legally Incapacitated Inventor:

If the Applicant is an Organization check here. ☒

Organization Name Staton Techiya LLC

Mailing Address Information For Applicant:

Address 1 2500 NE 35th Street

Address 2

City Lighthouse Point State/Province FL

Country¹ US Postal Code 33064

Phone Number Fax Number

Email Address Daniel@techiya.co

Additional Applicant Data may be generated within this form by selecting the Add button.

Application Data Sheet 37 CFR 1.76		Attorney Docket Number	CONT-16671689
		Application Number	
Title of Invention	PERSONALIZED SOUND MANAGEMENT AND METHOD		

Assignee Information including Non-Applicant Assignee Information:

Providing assignment information in this section does not substitute for compliance with any requirement of part 3 of Title 37 of CFR to have an assignment recorded by the Office.

Assignee 1			
Complete this section if assignee information, including non-applicant assignee information, is desired to be included on the patent application publication. An assignee-applicant identified in the "Applicant Information" section will appear on the patent application publication as an applicant. For an assignee-applicant, complete this section only if identification as an assignee is also desired on the patent application publication.			
If the Assignee or Non-Applicant Assignee is an Organization check here. ☒			
Organization Name	Staton Techiya LLC		
Mailing Address Information For Assignee including Non-Applicant Assignee:			
Address 1	2500 NE 35th Street		
Address 2			
City	Lighthouse Point	State/Province	FL
Country i	US	Postal Code	33064
Phone Number		Fax Number	
Email Address	Daniel@techiya.co		
Additional Assignee or Non-Applicant Assignee Data may be generated within this form by selecting the Add button.			

Application Data Sheet 37 CFR 1.76		Attorney Docket Number	CONT-16671689
		Application Number	
Title of Invention	PERSONALIZED SOUND MANAGEMENT AND METHOD		

Signature:

NOTE: This Application Data Sheet must be signed in accordance with 37 CFR 1.33(b). **However, if this Application Data Sheet is submitted with the INITIAL filing of the application and either box A or B is not checked in subsection 2 of the "Authorization or Opt-Out of Authorization to Permit Access" section, then this form must also be signed in accordance with 37 CFR 1.14(c).**

This Application Data Sheet **must** be signed by a patent practitioner if one or more of the applicants is a **juristic entity** (e.g., corporation or association). If the applicant is two or more joint inventors, this form must be signed by a patent practitioner, **all** joint inventors who are the applicant, or one or more joint inventor-applicants who have been given power of attorney (e.g., see USPTO Form PTO/AIA/81) on behalf of **all** joint inventor-applicants.

See 37 CFR 1.4(d) for the manner of making signatures and certifications.

Signature	/John Keady/			Date (YYYY-MM-DD)	
First Name	John	Last Name	Keady	Registration Number	56389
Additional Signature may be generated within this form by selecting the Add button.					

ABSTRACT

A personalized sound management system for an acoustic space includes at least one transducer, a data communication system, one or more processors operatively coupled to the data communication system and the at least one transducer, and a medium coupled to the one or more processors. The processors access a database of sonic signatures and display a plurality of personalized sound management applications that perform at least one or more tasks among identifying a sonic signature, calculating a sound pressure level, storing metadata related to a sonic signature, monitoring sound pressure level dosage levels, switching to an ear canal microphone in a noisy environment, recording a user's voice, storing the user's voice in a memory of an earpiece device, or storing the user's voice in a memory of a server system, or converting received text received in texts or emails to voice using text to speech conversion. Other embodiments are disclosed.

CLAIMS

What is Claimed:

1. An earpiece comprising:

- a sealing unit;
- a first microphone generating a first signal;
- a second microphone generating a second signal;
- a speaker;
- a memory that stores instructions; and
- a microprocessor, wherein the microprocessor is connected to the first microphone, the second microphone, the speaker, and the memory;
 - wherein the microprocessor is configured to execute the instructions to perform operations comprising:
 - sending an audio content signal to the speaker;
 - detecting an event in at least one of the first signal or the second signal; and
 - reducing the sound level of the audio content signal when the event is detected.

2. The earpiece according to claim 1, wherein the event is a user's voice.

3. The earpiece according to claim 1, wherein the event is a voice.

4. The earpiece according to claim 2, wherein the sound level of the audio content is reduced for a set time after the detection of a user's voice.

5. The earpiece according to claim 4, where the set time is selected by the user.

6. The earpiece according to claim 1, where the event is an emergency event.

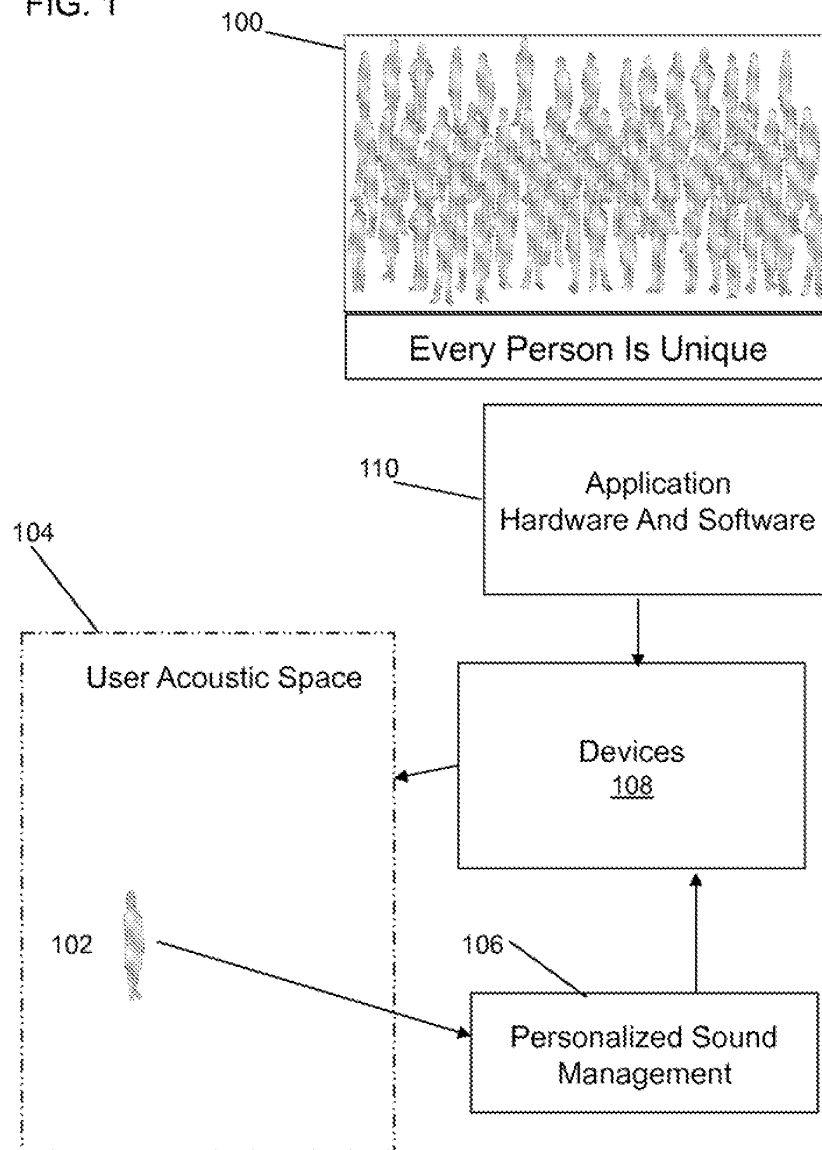
7. The earpiece according to claim 6, where the emergency event is at least one of a siren, an emergency sound, or an alarm or a combination of these.

8. The earpiece according to 1, wherein detecting an event compares the at least one of the first signal or the second signal to a sonic signature stored in the memory.

9. The earpiece according to claim 8, where the event is detected when the comparison indicates that the at least one of the first signal or the second signal is within a threshold value of the sonic signature.

10. The earpiece according to claim 1, where the first microphone is an ambient sound microphone.
11. The earpiece according to claim 10, where the second microphone is a second ambient sound microphone.
12. The earpiece according to claim 10, where the second microphone is an ear canal microphone.
13. The earpiece according to claim 5, where the set time is the time after which no further user voice is detected.
14. The earpiece according to claim 13, wherein the first microphone is an ambient sound microphone.
15. The earpiece according to claim 14, where the second microphone is a second ambient sound microphone.
16. The earpiece according to claim 14, where the second microphone is an ear canal microphone.
17. The earpiece according to claim 13, where the user selects the set time using a GUI on a communication device.

FIG. 1



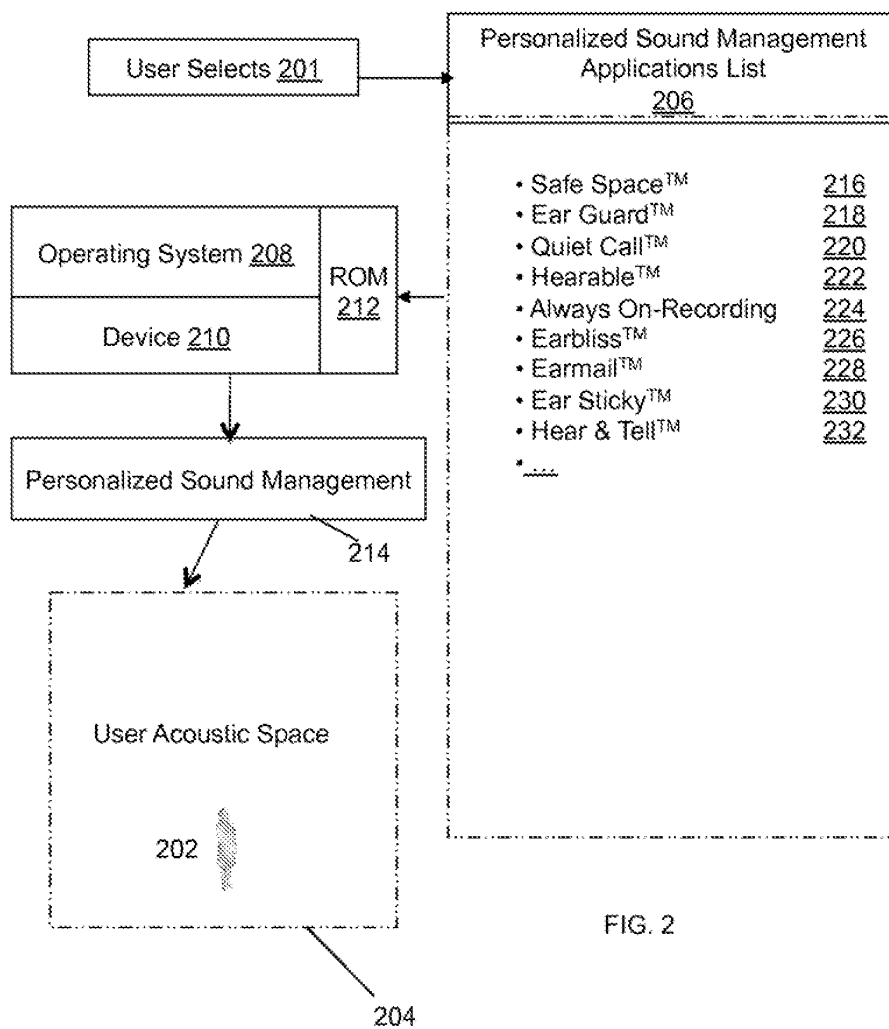


FIG. 2

FIG. 3

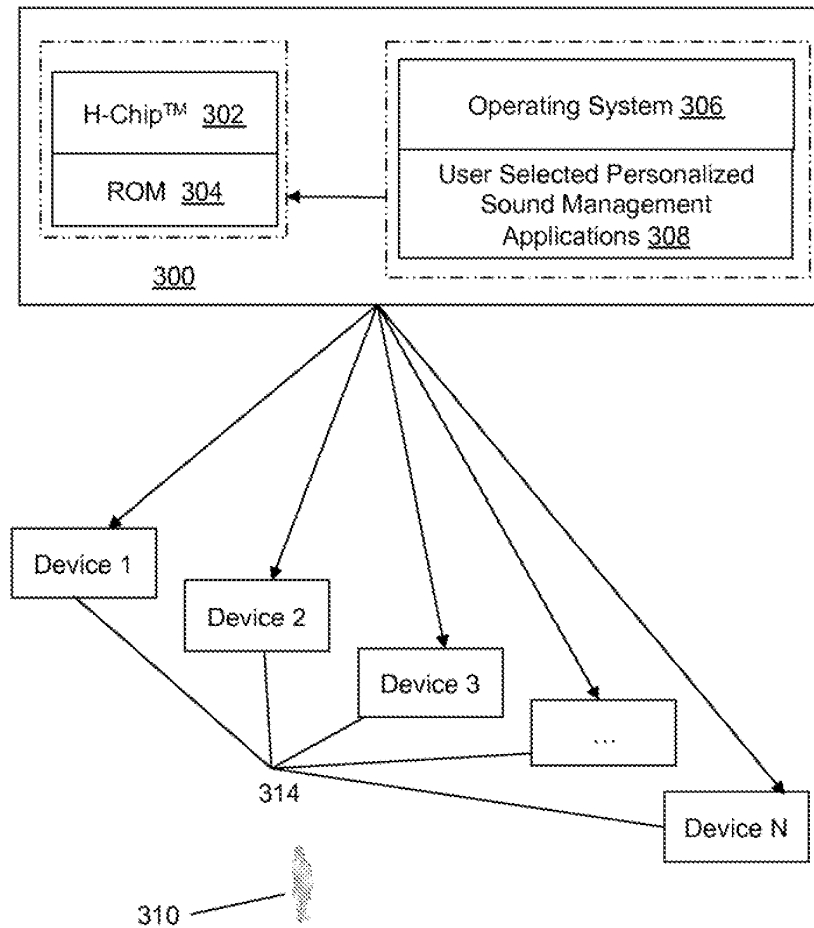


FIG. 4

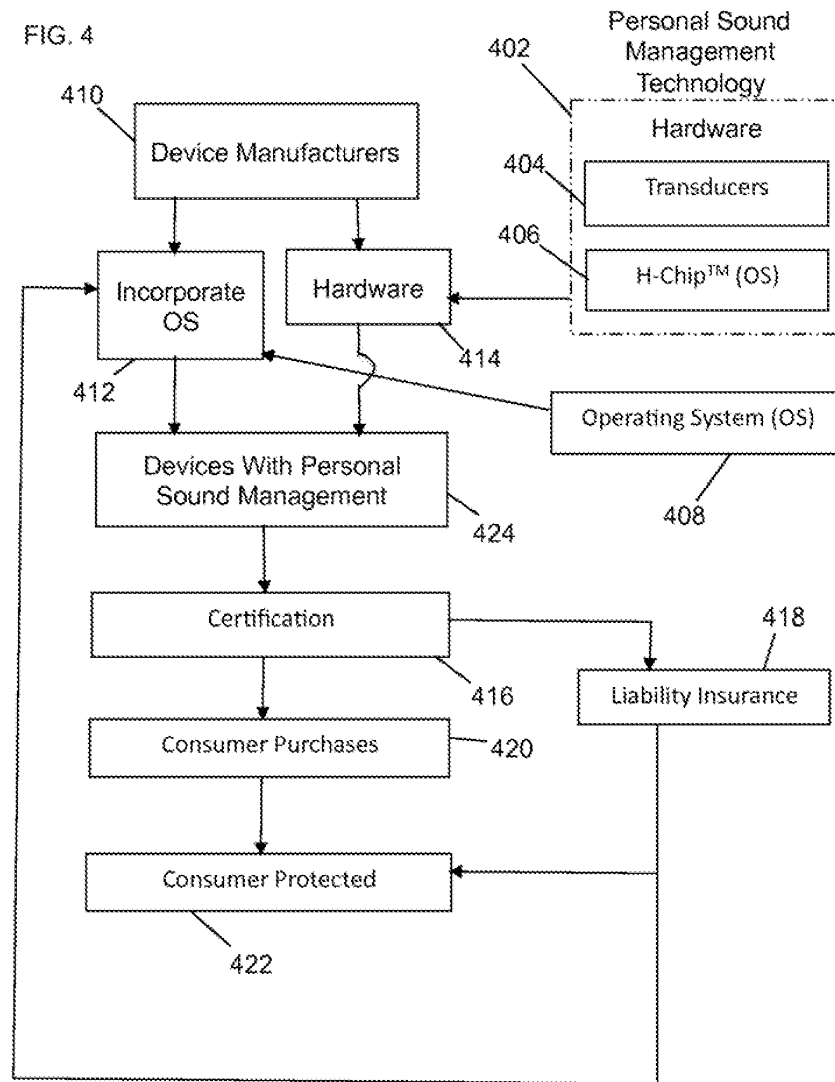
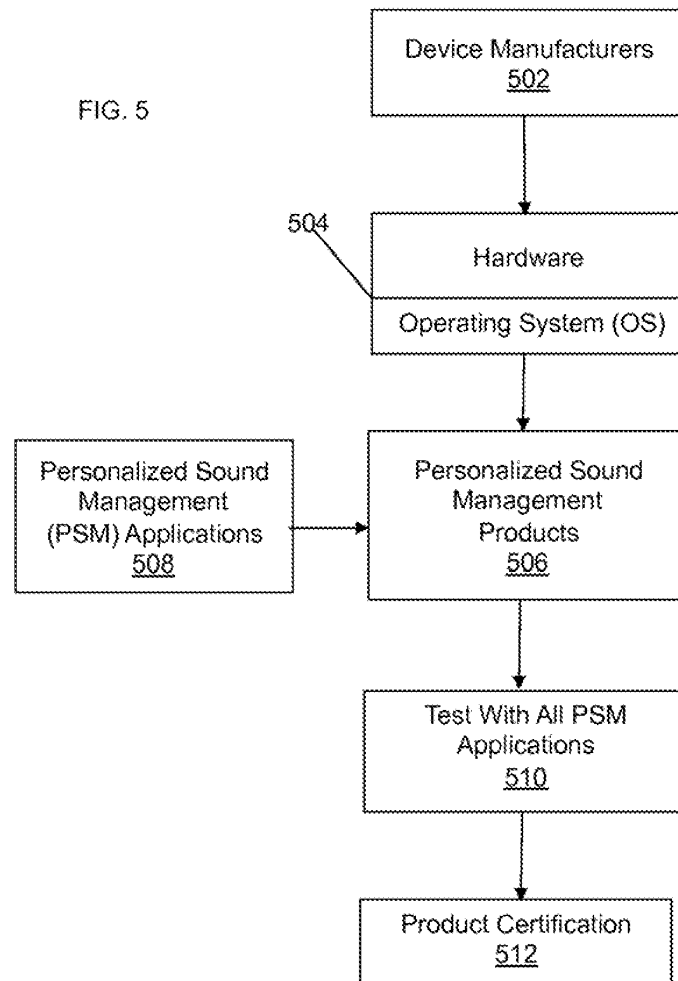


FIG. 5



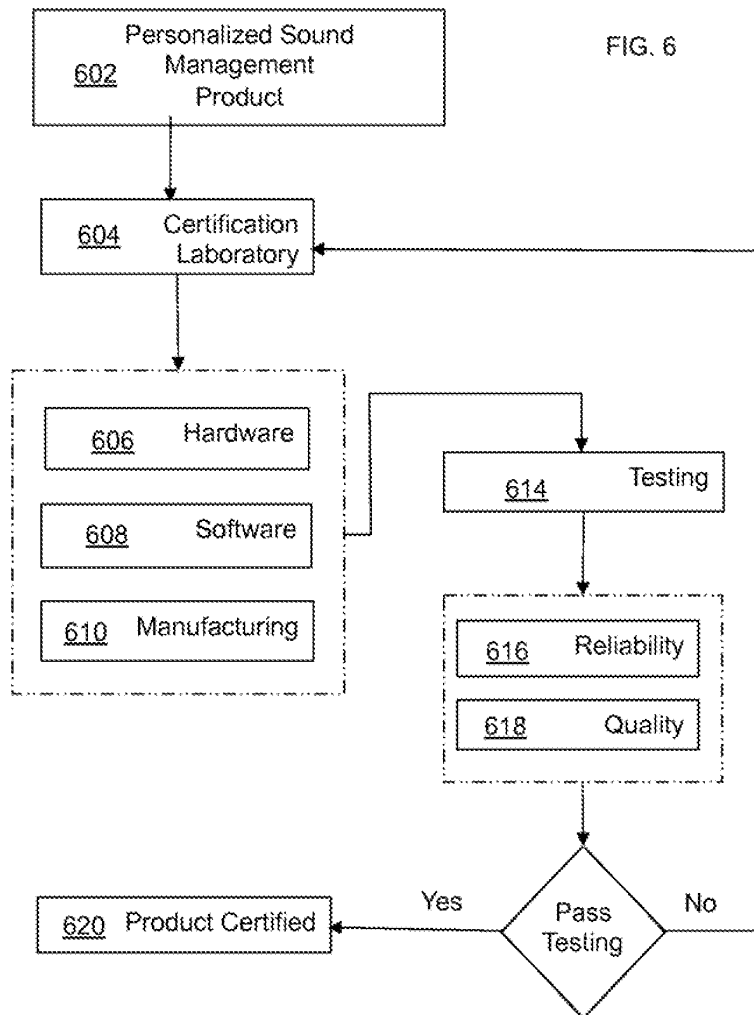


FIG. 7a

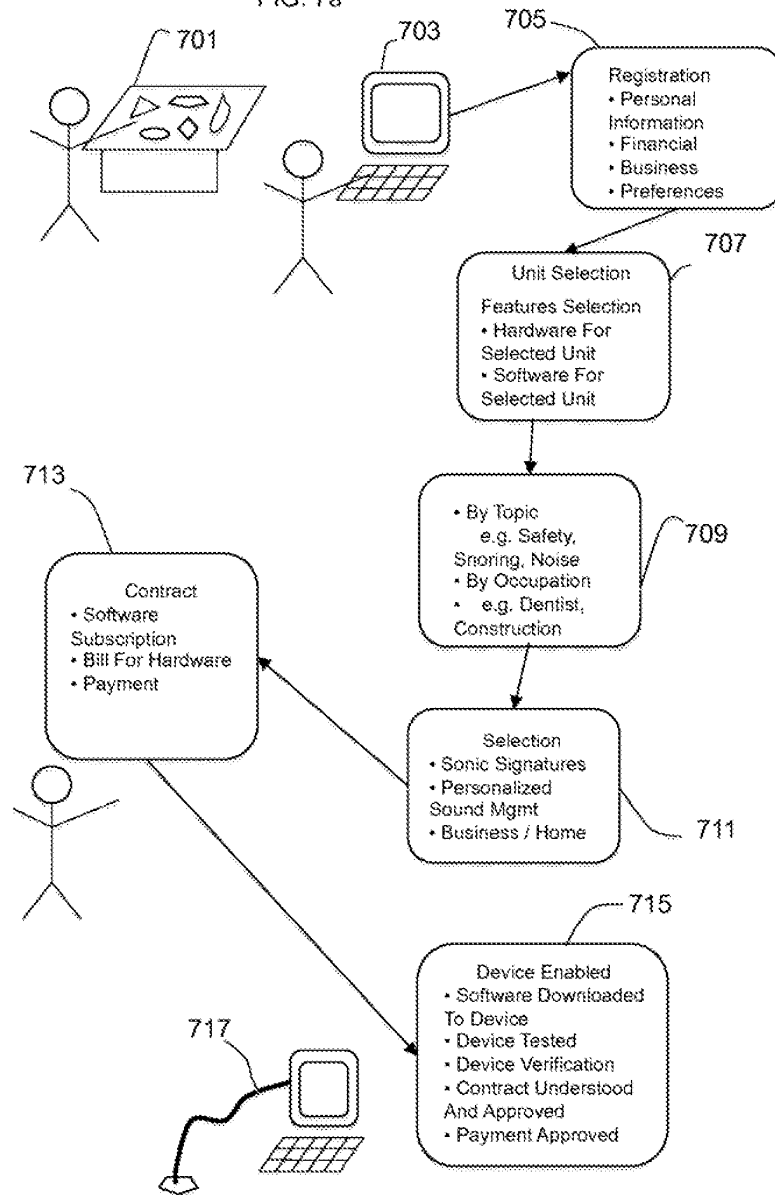
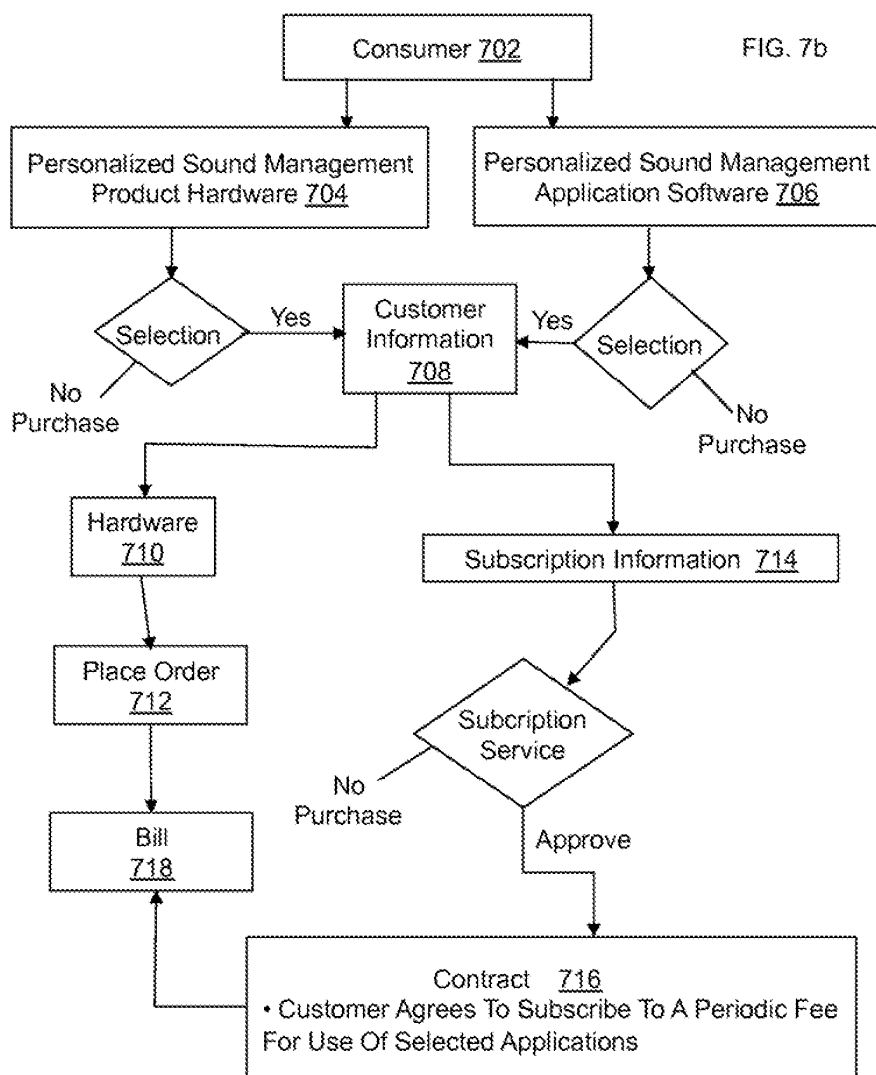


FIG. 7b



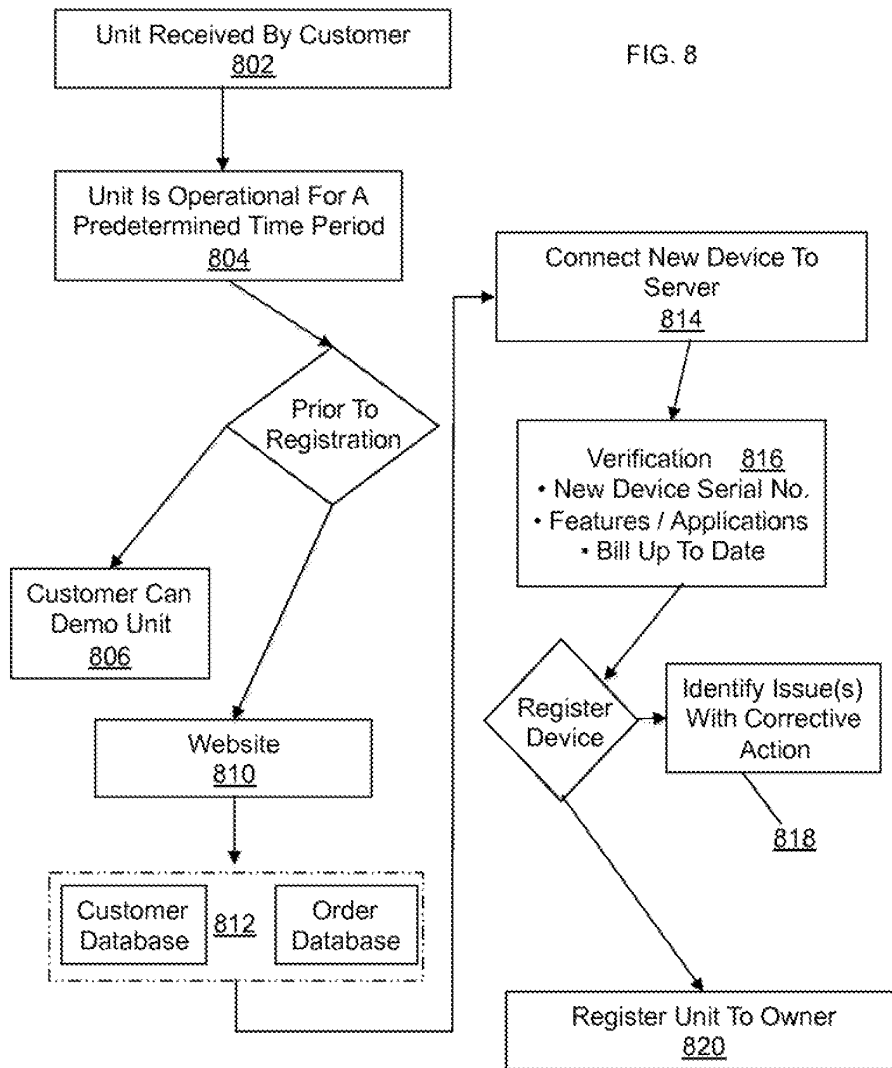
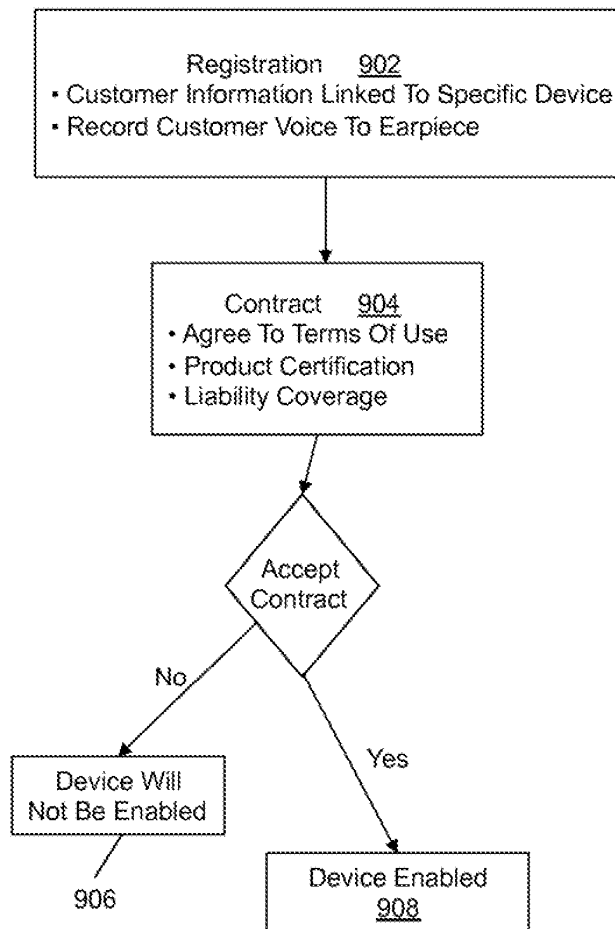


FIG. 9



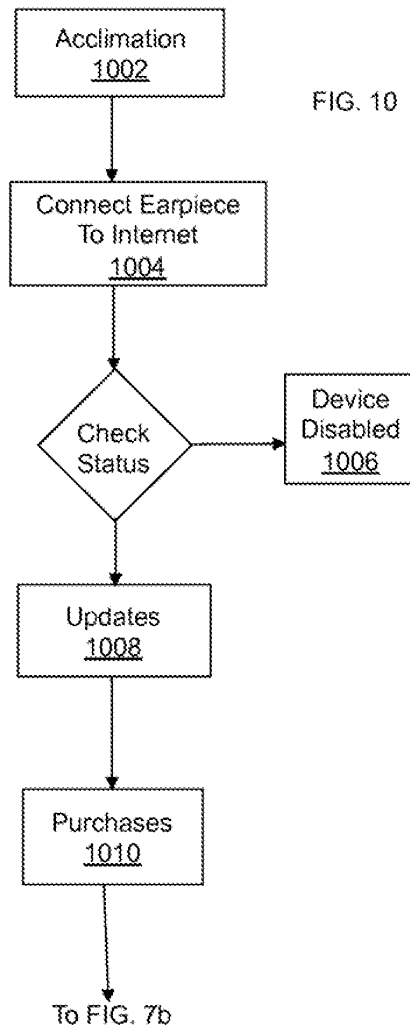


FIG. 10

FIG. 11

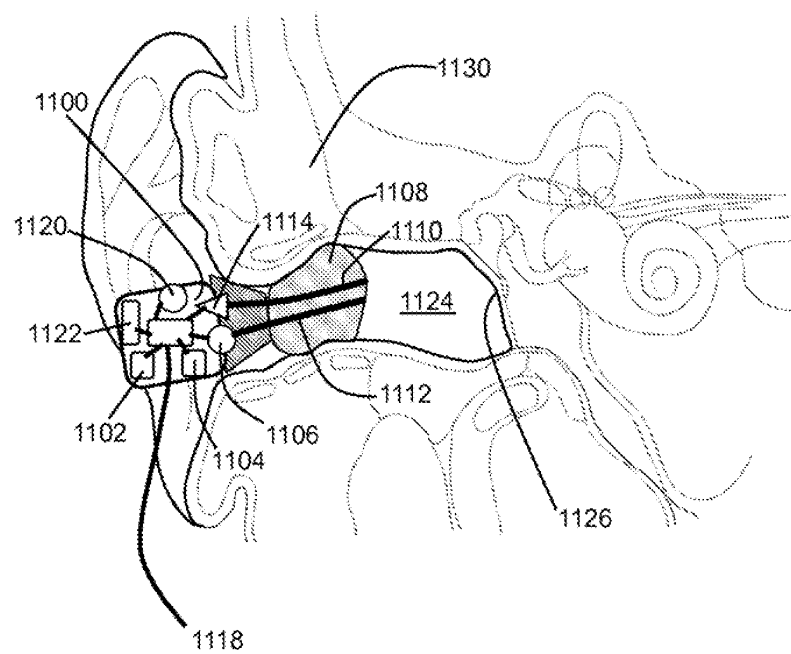


FIG. 12

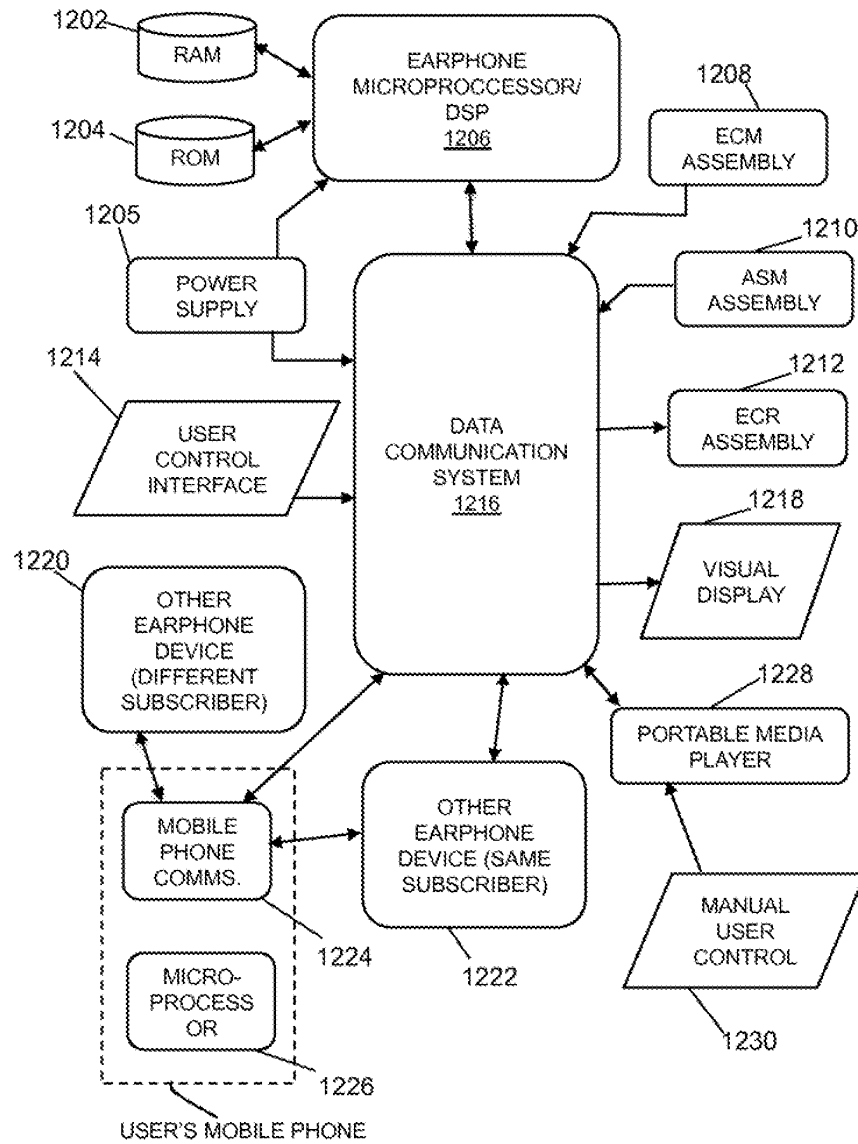


FIG. 13

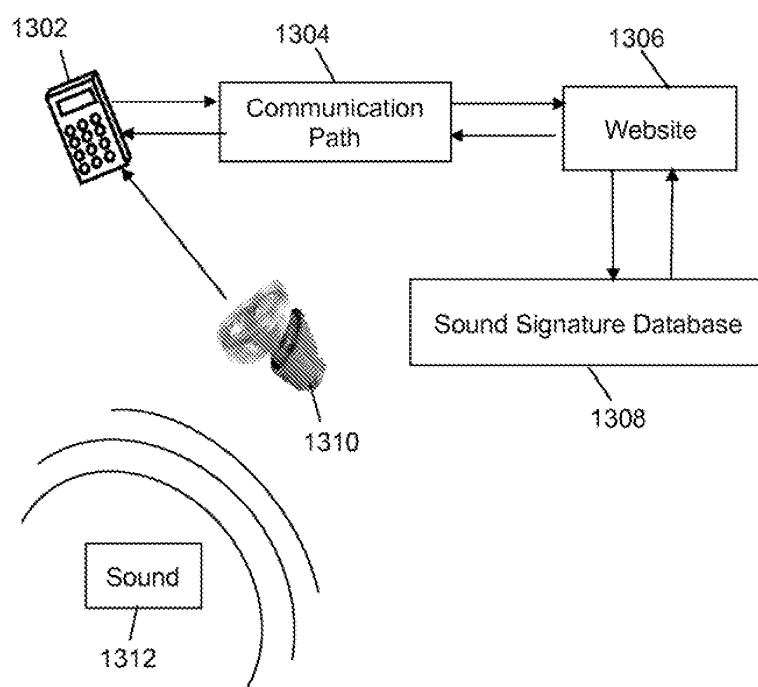
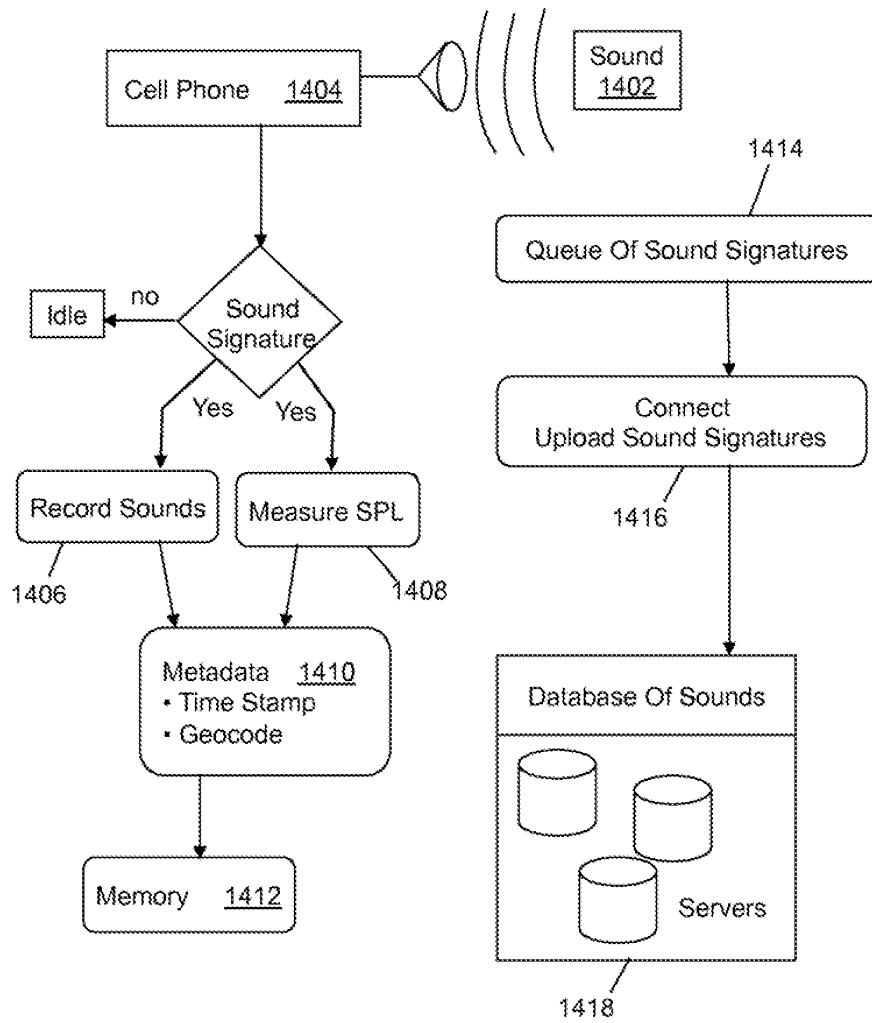


FIG. 14



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

DECLARATION (37 CFR 1.63) FOR UTILITY OR DESIGN APPLICATION USING AN APPLICATION DATA SHEET (37 CFR 1.76)

Title of Invention	Personalized Sound Management and Method
---------------------------	--

As the below named inventor, I hereby declare that:

This declaration is directed to: ☐ The attached application, or ☒ United States application or PCT international application number 14/846,994 filed on 09-07-2015

The above-identified application was made or authorized to be made by me.

I believe that I am the original inventor or an original joint inventor of a claimed invention in the application.

I hereby acknowledge that any willful false statement made in this declaration is punishable under 18 U.S.C. 1001 by fine or imprisonment of not more than five (5) years, or both.

WARNING:

Petitioner/applicant is cautioned to avoid submitting personal information in documents filed in a patent application that may contribute to identity theft. Personal information such as social security numbers, bank account numbers, or credit card numbers (other than a check or credit card authorization form PTO-2038 submitted for payment purposes) is never required by the USPTO to support a petition or an application. If this type of personal information is included in documents submitted to the USPTO, petitioners/applicants should consider redacting such personal information from the documents before submitting them to the USPTO. Petitioner/applicant is advised that the record of a patent application is available to the public after publication of the application (unless a non-publication request in compliance with 37 CFR 1.213(a) is made in the application) or issuance of a patent. Furthermore, the record from an abandoned application may also be available to the public if the application is referenced in a published application or an issued patent (see 37 CFR 1.14). Checks and credit card authorization forms PTO-2038 submitted for payment purposes are not retained in the application file and therefore are not publicly available.

LEGAL NAME OF INVENTOR

Inventor: John P. Keady Date (Optional): _____

Signature: /John P. Keady/

Note: An application data sheet (PTO/SB/14 or equivalent), including naming the entire inventive entity, must accompany this form or must have been previously filed. Use an additional PTO/AIA/01 form for each additional inventor.

This collection of information is required by 35 U.S.C. 115 and 37 CFR 1.63. The information is required to obtain or retain a benefit by the public which is to file (and by the USPTO to process) an application. Confidentiality is governed by 35 U.S.C. 122 and 37 CFR 1.11 and 1.14. This collection is estimated to take 1 minute to complete, including gathering, preparing, and submitting the completed application form to the USPTO. Time will vary depending upon the individual case. Any comments on the amount of time you require to complete this form and/or suggestions for reducing this burden, should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, U.S. Department of Commerce, P.O. Box 1450, Alexandria, VA 22313-1450. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. SEND TO: Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450.

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

Privacy Act Statement

The Privacy Act of 1974 (P.L. 93-579) requires that you be given certain information in connection with your submission of the attached form related to a patent application or patent. Accordingly, pursuant to the requirements of the Act, please be advised that: (1) the general authority for the collection of this information is 35 U.S.C. 2(b)(2); (2) furnishing of the information solicited is voluntary; and (3) the principal purpose for which the information is used by the U.S. Patent and Trademark Office is to process and/or examine your submission related to a patent application or patent. If you do not furnish the requested information, the U.S. Patent and Trademark Office may not be able to process and/or examine your submission, which may result in termination of proceedings or abandonment of the application or expiration of the patent.

The information provided by you in this form will be subject to the following routine uses:

1. The information on this form will be treated confidentially to the extent allowed under the Freedom of Information Act (5 U.S.C. 552) and the Privacy Act (5 U.S.C. 552a). Records from this system of records may be disclosed to the Department of Justice to determine whether disclosure of these records is required by the Freedom of Information Act.
2. A record from this system of records may be disclosed, as a routine use, in the course of presenting evidence to a court, magistrate, or administrative tribunal, including disclosures to opposing counsel in the course of settlement negotiations.
3. A record in this system of records may be disclosed, as a routine use, to a Member of Congress submitting a request involving an individual, to whom the record pertains, when the individual has requested assistance from the Member with respect to the subject matter of the record.
4. A record in this system of records may be disclosed, as a routine use, to a contractor of the Agency having need for the information in order to perform a contract. Recipients of information shall be required to comply with the requirements of the Privacy Act of 1974, as amended, pursuant to 5 U.S.C. 552a(m).
5. A record related to an International Application filed under the Patent Cooperation Treaty in this system of records may be disclosed, as a routine use, to the International Bureau of the World Intellectual Property Organization, pursuant to the Patent Cooperation Treaty.
6. A record in this system of records may be disclosed, as a routine use, to another federal agency for purposes of National Security review (35 U.S.C. 181) and for review pursuant to the Atomic Energy Act (42 U.S.C. 218(c)).
7. A record from this system of records may be disclosed, as a routine use, to the Administrator, General Services, or his/her designee, during an inspection of records conducted by GSA as part of that agency's responsibility to recommend improvements in records management practices and programs, under authority of 44 U.S.C. 2904 and 2908. Such disclosure shall be made in accordance with the GSA regulations governing inspection of records for this purpose, and any other relevant (*i.e.*, GSA or Commerce) directive. Such disclosure shall not be used to make determinations about individuals.
8. A record from this system of records may be disclosed, as a routine use, to the public after either publication of the application pursuant to 35 U.S.C. 122(b) or issuance of a patent pursuant to 35 U.S.C. 151. Further, a record may be disclosed, subject to the limitations of 37 CFR 1.14, as a routine use, to the public if the record was filed in an application which became abandoned or in which the proceedings were terminated and which application is referenced by either a published application, an application open to public inspection or an issued patent.
9. A record from this system of records may be disclosed, as a routine use, to a Federal, State, or local law enforcement agency, if the USPTO becomes aware of a violation or potential violation of law or regulation.

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

DECLARATION (37 CFR 1.63) FOR UTILITY OR DESIGN APPLICATION USING AN APPLICATION DATA SHEET (37 CFR 1.76)

Title of Invention	Personalized Sound Management and Method
As the below named inventor, I hereby declare that: This declaration is directed to: ☐ The attached application, or ☒ United States application or PCT international application number <u>14/846,994</u> filed on <u>09-07-2015</u> The above-identified application was made or authorized to be made by me. I believe that I am the original inventor or an original joint inventor of a claimed invention in the application. I hereby acknowledge that any willful false statement made in this declaration is punishable under 18 U.S.C. 1001 by fine or imprisonment of not more than five (5) years, or both. WARNING: Petitioner/applicant is cautioned to avoid submitting personal information in documents filed in a patent application that may contribute to identity theft. Personal information such as social security numbers, bank account numbers, or credit card numbers (other than a check or credit card authorization form PTO-2038 submitted for payment purposes) is never required by the USPTO to support a petition or an application. If this type of personal information is included in documents submitted to the USPTO, petitioners/applicants should consider redacting such personal information from the documents before submitting them to the USPTO. Petitioner/applicant is advised that the record of a patent application is available to the public after publication of the application (unless a non-publication request in compliance with 37 CFR 1.213(a) is made in the application) or issuance of a patent. Furthermore, the record from an abandoned application may also be available to the public if the application is referenced in a published application or an issued patent (see 37 CFR 1.14). Checks and credit card authorization forms PTO-2038 submitted for payment purposes are not retained in the application file and therefore are not publicly available.	
LEGAL NAME OF INVENTOR Inventor: <u>Steven Goldstein</u> Date (Optional): _____ Signature: <u>/Steven Goldstein/</u>	
Note: An application data sheet (PTO/SB/14 or equivalent), including naming the entire inventive entity, must accompany this form or must have been previously filed. Use an additional PTO/AIA/01 form for each additional inventor.	

This collection of information is required by 35 U.S.C. 115 and 37 CFR 1.63. The information is required to obtain or retain a benefit by the public which is to file (and by the USPTO to process) an application. Confidentiality is governed by 35 U.S.C. 122 and 37 CFR 1.11 and 1.14. This collection is estimated to take 1 minute to complete, including gathering, preparing, and submitting the completed application form to the USPTO. Time will vary depending upon the individual case. Any comments on the amount of time you require to complete this form and/or suggestions for reducing this burden, should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, U.S. Department of Commerce, P.O. Box 1450, Alexandria, VA 22313-1450. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. SEND TO: Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450.

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

PERSONALIZED SOUND MANAGEMENT AND METHOD

CROSS-REFERENCE TO RELATED APPLICATIONS

[0001] This application is a continuation of U.S. Application Ser. No. 16/671,689, filed 1 Nov. 2019, which is a continuation of U.S. application Ser. No. 14/846,994, filed 7 Sep. 2015. U.S. application Ser. No. 14/846,994 is a continuation of U.S. application Ser. No. 12/560,097 filed on 15 Sep. 2009 and claims the benefit of U.S. provisional patent application No. 61/098,914 filed 22 Sep. 2008. The disclosure of the aforementioned applications are all incorporated herein by reference in their entireties.

FIELD OF THE INVENTION

[0002] The invention relates in general to methods of managing sound, and particularly though not exclusively, is related to personalized sound management.

BACKGROUND OF THE INVENTION

[0003] The world of two hundred years ago is substantially different than the present day earth. Similarly, the acoustic environment that surrounds us is also changing. For example, the sounds of a large city have changed as the mode of transportation transitioned from walking and horse and buggy, to cars, subways, and airplanes.

[0004] In general, humans are continuously inundated by a diversity of sounds. Many of the sounds are not critical to our lives but our brain processes these sounds and tries to distinguish between them. Background sound levels can also make it difficult to hear sounds that are important. Too much acoustic information can cause an auditory overload that can impact both the health and safety of an individual.

SUMMARY

[0005] The invention relates in general to methods and system for implementing a suite of personalized sound applications for modifying a user's acoustic environment and more particularly, though not exclusively, to facilitating the adoption of the technology, ensuring the technology functions properly, protecting both the manufacturers and consumer, and providing user selection and control over the management of sound.

[0006] At least one exemplary embodiment is directed to a method of personalized sound management comprising the steps of: selecting at least one of a plurality of personalized sound management applications through a client system where the user selects the at least one of the plurality of personalized sound management applications from a website; accepting a subscription contract for using the at least one of the personalized sound management applications; and loading the selected at least one of the plurality of applications from a server system to a device where the device has at least one microphone, at least one speaker, and a processor configured to identify sonic signatures where each sonic signature is identified using a Gaussian mixture model.

[0007] At least one exemplary embodiment is directed to a method of implementing personalized sound

management comprising the steps of: recording sound with a microphone of a communication device; analyzing the sound for acoustic information relevant for personalized sound management applications; storing a sonic signature in a memory of the communication device; calculating a sound pressure level of the sonic signature; and attaching and storing metadata related to the sonic signature and sound pressure level including a time stamp and geocode.

BRIEF DESCRIPTION OF THE DRAWINGS

[0008] Exemplary embodiments of the present invention will become more fully understood from the detailed description and the accompanying drawings, wherein:

[0009] FIG. 1 illustrates a block diagram of the interaction of personalized sound management in accordance with at least one exemplary embodiment;

[0010] FIG. 2 illustrates a block diagram of a partial list of applications for personalized sound management in accordance with at least one exemplary embodiment;

[0011] FIG. 3 illustrates a block diagram of the interaction of a personalized management enabled device with other devices in accordance with at least one exemplary embodiment;

[0012] FIG. 4 illustrates a flow chart of a process of providing personalized sound management in accordance with at least one exemplary embodiment;

[0013] FIG. 5 illustrates a flow chart of an application testing in accordance with at least one exemplary embodiment;

[0014] FIG. 6 illustrates a flow chart of the testing of a personal sound management device in accordance with at least one exemplary embodiment;

[0015] FIGS. 7a and 7b are diagrams illustrating a consumer purchase process in accordance with at least one exemplary embodiment;

[0016] FIG. 8 illustrates a flow chart of registering a new device that includes personalized sound management applications in accordance with at least one exemplary embodiment;

[0017] FIG. 9 illustrates a flow chart of enabling the new device in accordance with at least one exemplary embodiment;

[0018] FIG. 10 illustrates a flow chart of updating a unit or device in accordance with at least one exemplary embodiment;

[0019] FIG. 11 illustrates a diagram of a device for implementing personalized sound management in accordance with at least one exemplary embodiment;

[0020] FIG. 12 illustrates a block diagram of a device for implementing personalized sound management in accordance with at least one exemplary embodiment;

[0021] FIG. 13 illustrates a diagram of a communication device or earpiece configured to provide sonic signatures to a sonic signature database in accordance with at least one exemplary embodiment; and

[0022] FIG. 14 illustrates a block diagram of a cell phone capturing a sonic signature and providing the sonic signature to a database of sounds in accordance with at least one exemplary embodiment.

DETAILED DESCRIPTION OF EXEMPLARY EMBODIMENTS OF THE PRESENT INVENTION

[0023] The following description of exemplary embodiment(s) is merely illustrative in nature and is in no way intended to limit the invention, its application, or uses.

[0024] Processes, techniques, apparatus, and materials as known by one of ordinary skill in the art may not be discussed in detail but are intended to be part of the enabling description where appropriate. For example specific computer code may not be listed for achieving each of the steps discussed, however one of ordinary skill would be able, without undue experimentation, to write such code given the enabling disclosure herein. Such code is intended to fall within the scope of at least one exemplary embodiment.

[0025] Additionally, the sizes of structures used in exemplary embodiments are not limited by any discussion herein (e.g., the sizes of structures can be macro (centimeter, meter, millimeter, micro (micrometer), nanometer size and smaller).

[0026] Notice that similar reference numerals and letters refer to similar items in the following figures, and thus once an item is defined in one figure, it may not be discussed or further defined in the following figures.

[0027] In all of the examples illustrated and discussed herein, any specific values, should be interpreted to be illustrative only and non-limiting. Thus, other examples of the exemplary embodiments could have different values.

[0028] FIG. 1 is a diagram of personal sound management in accordance with at least one exemplary embodiment. In our global community 100, each person is unique. The differences between individuals can be genetic, cultural, environmental, personal, or physical to name just a few. The combination of these traits is what makes us unique. One of the main senses a human relies on is our auditory sense. Hearing impacts every aspect of our life from communication to safety. How each individual perceives and uses sound is also unique.

[0029] From an acoustic perspective, sound pressure levels have been rising steadily. The diversity of sounds is also increasing. The human brain continuously processes the acoustic information provided by the ears. Both the sound pressure levels and the sound diversity puts increasing strain on a person to determine what they need to hear versus what they are hearing. Ultimately, this "acoustic overload" can

manifest itself in physical ailments and health risks such as stress, sleeplessness, and depression.

[0030] A person 102 has an acoustic space 104 from which a majority of sounds they receive emanate. Some of the sounds are useful to person 102 and some sounds may have no use. Acoustic space 104 can be large or small. Acoustic space 104 will change with time and location. For example, acoustic space 104 can be a room, a stadium, a forest, an automobile, a plane, or the ear canal of person 102. Personalized sound management (PSMTM) 106 is the ability to modify what is received from acoustic space 104 thereby tailoring or personalizing the received acoustic information to meet the needs of person 102.

[0031] Devices 108 are a source of acoustic information within acoustic space 104. In general, device(s) 108 have a speaker, a microphone, or one or more of both. In general, application hardware and software 110 is incorporated in, although can be external also, device(s) 108 to allow personalization of acoustic space 104. Person 102 selects the applications and controls device(s) 108 to modify acoustic space 104 to meet their personal needs and wants. The benefit and utility of personalizing and managing sound received by person 102 will be disclosed in more detail.

[0032] FIG. 2 is a diagram illustrating a partial list of applications for personalized sound management in accordance with at least one exemplary embodiment. A user 202 has an acoustic space 204 that includes both real sounds and potential sounds. In many cases, acoustic space 204 can be inundated with a variety of sounds not under control of user 202. This lack of control over acoustic information and sound within acoustic space 204 can make for a reduction in quality of life, loss of efficiency, or more seriously affecting user's 202 health and safety.

[0033] In at least one exemplary embodiment, a user 202 selects 201 at least one personalized sound management application from a personalized sound management applications list 206. Although only a partial list, applications such as Safe SpaceTM 216, EarGuardTM 218, Quiet CallTM 220, Ear StickyTM 230, HearableTM 222, Always On-RecordingTM 224, EarblissTM 226, Hear & TellTM 232, and Ear MailTM 228 will be used to illustrate how acoustic space 204 is personalized and managed for the benefit of user 202. A more detailed explanation of personalized sound management applications 206 will be described.

[0034] The selected applications of user 202 are loaded into ROM 212. An operating system 208 is configured operably with device 210 and ROM 212. Operating system 208, in conjunction with personalized sound management applications 206, provides an interface to the user for personalized sound management 214 to meet user needs to manage user acoustic space 202 and for controlling device 210.

[0035] ROM 212 can be read only memory such that the selected applications from personalized sound management list 206 cannot be tampered with or rewritten. However in at least one exemplary embodiment ROM 212 can also be memory that can be read and written to so that a user can change settings. Alternately, ROM 212 can be other types of memory such as fe-ram, phase change memory, magneto-resistive memory, hard drive, sram, dram, eprom, eeprom, and other non-volatile or read only memories where the selected applications are secure from any type of downloading, tampering, or modification through physical or software protection. Monitoring of ROM 212 and the selected

applications can also be added where notification is sent or device 210 is disabled when an improper action is detected. ROM 212 ensures that an application will operate as disclosed for user 202.

[0036] Components of device 210 can be built in a single unit or operatively coupled units. For example, multiple devices of 210 can be wired, optically connected, wirelessly connected or a combination thereof. Operating system 208 can be run remotely to operate device 210 or reside within device 210. Similarly, ROM 212 can be located in device 210 or remote to device 210. In at least one exemplary embodiment, operating system 208 resides in ROM 212. Device 210 typically has at least one microphone or at least one speaker, or both. The at least one microphone provides acoustic information for use in conjunction with personalized sound management applications. The at least one speaker provides acoustic information to user 202 and acoustic space 204. Device 210 has a microprocessor (not shown) for running applications 206. In at least one exemplary embodiment the microprocessor is dedicated to running personalized sound management applications 206.

[0037] In general, personalized sound management applications are customizable point solutions that allow user 202 to handle a variety of tasks associated with managing acoustic space 204. The selection of personalized sound management applications will depend on the person, the device, and the acoustic space being managed. Non-limiting examples of devices that can use personalized sound management applications with the appropriate hardware and operating system, are earpieces, media devices, and vehicles.

[0038] Described hereinbelow are brief overviews of the user selected personalized sound management applications:

[0039] Safe Space™ 216 is an "intelligent hearing" application that detects and outputs a response based on the identification of a recognized sound. The concept of recognizing sounds is described as Sonic Signature Detection. Safe Space™ 216 also includes a user defined hierarchy and can provide responses based on the hierarchy.

[0040] A brief example is provided of how Safe Space™ 216 manages the acoustic space corresponding to the interior of an automobile. As is well known, automobiles are designed to have a quiet interior space. Sound insulation is deliberately placed around the car interior to attenuate sounds coming from the car exterior. Furthermore, automobile drivers often listen to high volume music while driving. This combination makes it difficult to hear sounds such as emergency vehicles. People often get seriously injured because they hear the emergency vehicle when it is in close proximity to the vehicle and panic causing an accident. All descriptions below describing personalized sound management applications assume that the device using the application has incorporated within it the hardware and software required to run the application and perform the application function.

[0041] In this example, Safe Space™ 216 detects emergency vehicle horns when they are a substantial distance away. In at least one exemplary embodiment, a microphone is exterior to the car and can pick up sounds in the ambient or car exterior. Sonic signatures related to emergency vehicles such as fire trucks, ambulances, and police cars are stored in the system. Safe Space™ 216 analyses sounds from the microphone. A response is provided if one of the stored sonic signatures is detected. In at least one

exemplary embodiment, upon detecting a fire truck siren, Safe Space™ 216 can initiate playing the identified signal through the car stereo system for the car driver to hear and respond to. In at least one exemplary embodiment, Safe Space™ 216 can calculate the direction, distance, and street (through GPS) of the approaching emergency vehicle. The information is then provided visually or vocally to the driver. For example, the car stereo automatically turns down the music and states through the speaker system that an ambulance is coming east bound on 3rd Street or an ambulance is approaching from the right.

[0042] EarGuard™ 218 is a personalized sound management application that improves listening quality and safety. Hearing disorders are increasing at a very high rate. Many people live in an environment such as a noisy urban environment or an industrial manufacturing area where sound pressure levels are consistently high. Moreover, people themselves are subjecting themselves to loud and sustained sounds. Examples of extreme or sustained sound exposure are portable media players using earbuds, sport shooting, and rock concerts. The trend is a growing population of people that have or will have hearing problems.

[0043] The ear is a very sensitive instrument having a large dynamic range that allows us to hear sounds ranging from a whisper to a shout. Subjecting the ear to man-made cacophony is now known to metabolically exhaust the highly specialized sensory cells in the inner ear, causing them to die and be replaced by scar tissue in the hearing organ. Ear Guard™ 218 is an application that monitors the sound exposure of the user and protects the ear from damage.

[0044] Briefly, Earguard™ 218 improves listening quality and safety by employing a personal hearing zone that measures sound levels within the ear and in one exemplary embodiment an intelligent level control to protect against over amplification. Earguard™ 218 includes a sound pressure level (SPL) dose management system. The SPL dose management system takes into account both transient and long term sound. In at least one exemplary embodiment, when sound at the user's eardrum is above a certain threshold known to begin the process of metabolically exhausting the ear, the metric known as SPL Dose increases. The SPL dose decreases when sound is below that threshold according to a recovery function that mirrors the recovery of the ear from excessive sound exposure. In at least one exemplary embodiment, Earguard™ 218 will indicate to the user damage to the ear is likely if the sound exposure is continued. In this scenario, the user has the control to take the appropriate action to protect his/her ears.

[0045] In at least one exemplary embodiment, an intelligent level adjustment system is a personalized sound management application that automatically estimates the preferred listening level of an audio content signal (e.g. speech or music audio from a device) depending on an analysis of the level, other acoustic features of the ambient environment, and an analysis of the audio content signal. Thus, a human-machine relationship is nurtured with this bi-directional control flow from human to the intelligent level adjustment system and from intelligent level adjustment system to the human user.

[0046] A substantial benefit of an application such as Earguard™ 218 is the protection of the ear from damage. Furthermore, this safeguard if propagated will prevent hearing loss thereby reducing the financial burden on the economy in years to come for the individual, business, and government for

hearing loss remedies. Thus, using Earguard™ 218 could not only stem the growth in hearing related problems but greatly reduce it over the years to come.

[0047] Quiet Call™ 220 is an application that allows user 202 having heard a voice message to respond to the remote caller through a non-verbal means. An example of a non-verbal response is a key-pad entered text message. The entered text message is converted to a speech audio message and is sent to the remote caller. The caller then receives the speech audio message.

[0048] An example of the utility of Quiet Call™ 220 is illustrated when user 202 is in an important business meeting but is required to provide input to another remote meeting. User 202 receives the voice message sent from someone in the remote meeting. User 202 responds by entering the response through his/her phone keypad; the text is converted to voice and sent to the person at the remote meeting who sent the original message. User 202 does not have to interrupt the meeting to listen to the voice message nor to reply. Thus, the meeting attended by user 202 can move forward with little or no loss of momentum that would occur if the meeting was disrupted by the call.

[0049] Hearable™ 222 is a speech enhancement application that improves voice communication. For example, Hearable™ 222 can be used with an earpiece device having at least two microphones, an ambient sound microphone for receiving sounds in the ambient environment and an ear canal microphone for receiving sounds in the ear canal. A common use for the earpiece would be with a communication device such as a cell phone or other phone system. The earpiece using the Hearable™ 222 application would normally use the ambient sound microphone for receiving and transmitting the user's spoken voice. In this mode, the user's voice will be natural sounding and easily recognizable on the receiving end.

[0050] In a noisy environment it can be difficult to carry on a telephone conversation. The ambient sound microphone will pick up the voice and the noise in the ambient environment. The earpiece will switch to the ear canal microphone when the ambient sound microphone detects a high background noise level. The user's voice is readily picked up by the ear canal microphone but the noise in the ambient environment is substantially reduced. Switching to the ear canal microphone allows the receiving party to clearly hear the user's voice. The problem with using the ear canal microphone is that user's voice received in the ear canal sounds different because of frequency roll off in the upper spectrum of the voice range. Although the user can be heard clearly, the user's voice may not sound right to the receiving end.

[0051] Hearable™ 222 is a personalized sound management application that improves the sound quality of the user's voice. Hearable™ 222 uses a combination of the sound received by the ambient sound microphone and the ear canal microphone to create a more natural sounding voice. The combination of the two signals is a function of the background noise level. Explaining further the signal from the ambient sound microphone is used less as the background noise level increases. Hearable™ 222 allows a user to have a conversation in a noisy environment while providing a high quality voice signal that is intelligible and recognizable at the receiving end.

[0052] Always On-Recording™ 224 is a personalized sound application that acts as its name implies. A

device using the Always On-Recording™ 224 application is recording the most current audio information for user recall. The recording is stored in a buffer that will allow the user to immediately access the audio information. The buffer will have a finite amount of storage. The recording time will be a function of the buffer or memory available for the Always On-Recording™ 224 application.

[0053] Always On-Recording™ 224 provides utility for short durations of recording. For example, in an application where a user is receiving information such as a phone number or driving directions. The user knows that the device employing Always On-Recording™ 224 has the stored acoustic information and can immediately listen-again to the buffer contents thereby repeating the phone number or driving directions. Similarly, if the user was discussing a contract term and wanted to know exactly what the person said, the user could immediately re-listen to make sure that what they thought they heard is exactly what they heard.

[0054] Earbliss™ 226 is a personalized sound management application to provide acoustic isolation from someone who snores while allowing other sounds to be heard. A large percentage of the population suffers though sleepless nights because of the sounds generated by people with sleep apnea and more generally due to loud snoring. Moreover, sleep deprivation can have serious consequences related to health and disposition.

[0055] Earbliss™ 226 is a sleep zone technology that utilizes sonic signature detection to insulate sleep partners against intrusion from snoring while still providing awareness of priority sounds. In this example, a sonic signature is acoustic information related to the sounds of a person snoring. In at least one exemplary embodiment, Earbliss™ 226 is an application that is used in conjunction earpieces.

[0056] Sealing the ear canal with ear plugs will attenuate the snoring but also blocks out all sounds. Hearing is one of the most vital senses that we have. Under normal conditions we cannot turn off our hearing which allows us to wake in a critical situation. Ear plugs will block out sounds of consequence. For example, the user may not hear their baby crying or a child leaving their room.

[0057] Earbliss™ 226 enables a user to attenuate snoring while hearing other sounds around them. The earpieces fit in the ear canal of the user to seal or partially seal the ear canal. The earpieces have an ambient sound microphone for receiving acoustic information from the ambient environment and an ear canal receiver for providing sound to the user's ear canal. As mentioned previously, the earpieces will have a sonic signature related to snorer's snoring stored in memory in the device.

[0058] The ambient sound microphone picks up all sounds in the ambient environment including the snorer's snoring. The earpiece processes all the acoustic information coming from the ambient sound microphone and looks for signals similar to stored sonic signatures. Pattern recognition approaches are applied based on the known sonic signatures to detect the snoring sounds from their corresponding sonic signatures. More specifically, sonic signatures can then be compared to learned models to identify a corresponding snoring sound. Once identified the snoring sound is suppressed and not output to the ear canal by the ear canal receiver. Thus, the wearer of the earpieces does not hear the snoring.

[0059] Conversely, sounds in the ambient environment that are not recognized through the processing

of acoustic information by the earpieces can be passed transparently to the ear canal receiver for reproduction within the ear canal. In this mode, the sound produced in the ear canal sufficiently matches the ambient sound outside the ear canal, thereby providing a "transparency" effect other than the suppressed sonic signature (snoring). The earpieces can also enhance sound. For example, the earpieces having sonic signatures related to a fire truck siren or a baby crying can detect either signal and then amplify the signal (fire truck siren, baby crying) so as to make the wearer of the earpieces aware of the signal's detection. Thus, Earbliss™ 226 modifies the acoustic environment of the user to eliminate what does not need to be heard while allowing the user to be aware of other sounds in a normal context.

[0060] Ear Mail™ 228 is a personalized sound management application for converting text to voice. In particular, Ear Mail™ 228 provides great utility to users of email and text messaging although not limited to these examples. Email and text messaging is becoming a very popular form of communication among a large portion of the population. It is not always convenient or in some cases not prudent to review written text depending on the situation.

[0061] Ear Mail™ 228 converts the text of a message or email to a speech audio message using a text to speech algorithm. The converted speech audio message is replayed through a loudspeaker coupled to a device using the Ear Mail™ 228 application. For example, Ear Mail™ 228 used in a smart phone coupled to the stereo system of a car through a blue tooth connection could playback the text or emails through the car speakers. The user could hear their messages while driving safely down the road.

[0062] Ear Sticky™ 230 is a personalized sound management application for recording information that can be saved and used for future use. In at least one exemplary embodiment, Ear Sticky™ 230 is a mobile communication application that can be used in a device such as a cell phone or an earpiece that is operably coupled to other devices. Ear Sticky™ 230 can record communication through a device or sounds in the ambient environment. Sounds in the ambient environment are recorded by an ambient sound microphone.

[0063] In a first example of an Ear Sticky™ 230 application, a conversation between a husband and wife occurs and a list of items to pick up at several stores is disclosed. The user of Ear Sticky™ 230 does not need to write down or remember this list. The conversation is being recorded and stored in a buffer. The user activates Ear Sticky™ 230 to store the recorded conversation to be reviewed at a later time. Thus, the user of Ear Sticky™ 230 could recall and listen to the list on the way home to ensure that the right items are picked up at the appropriate store.

[0064] In a second example of an Ear Sticky™ 230 application, a device records with an ambient sound microphone. For example, the user of Ear Sticky™ 230 comes up with a great concept to solve a problem he or she has been working on for some time. The user can enable Ear Sticky™ 230 and uses the ambient sound microphone to record his or her voice to convey the idea, concept, or thoughts and store it for review at a later time. In general, Ear Sticky™ 230 provides utility and convenience in storing and recalling sounds in one's acoustic space.

[0065] Hear & Tell™ 232 is a personalized sound management application for recording a sound,

training a Gaussian mixture model to learn features of the sound and then storing the Gaussian mixture model in memory of the device. A user of Hear & Tell™ 232 can record the sound or provide a sound, called herein as a sonic signature. The device is operably coupled to at least one microphone to compare sounds received from the microphone against the stored sonic signature. The device can perform an operation that modifies the user's acoustic space 204 once a sound is identified as being similar to a sonic signature. Examples of several operations the device can perform are passing the detected signal through to the user, boosting the sound such that the user is made aware of the detected sound, rejecting the sound so the user does not hear the detected sound, attenuating the detected sound, and replacing the detected sound with an alternate sound to name.

[0066] The Hear & Tell™ 232 application will store a Gaussian mixture model (GMM) for every sonic signature that it has been trained to recognize. Each GMM is completely specified by a mixture of mean vectors, a mixture of covariance matrices, and a mixture of weights.

[0067] An example of a warning sound (e.g. siren of emergency vehicle) will be used to further illustrate the Hear & Tell™ 232 learning application. Each GMM provides a model for the distribution of the feature statistics for each warning sound in a multi-dimensional space. Upon presentation of a new feature vector, the likelihood of the presence of each warning sound can be calculated. In at least one exemplary embodiment, each warning sound's GMM is evaluated relative to its anti-model, and a score related to the likelihood of that warning sound is computed in order to determine if a sound is detected. A threshold can be applied directly to this score to decide whether the warning sound is present or absent. Similarly, a sequence of scores can be relayed and used in a more complex rule set to determine absence or presence of the sound. Thus, Hear & Tell™ 232 allows a user to store, model, and train a device for sonic signatures under user control and selection thereby allowing a user to modify their acoustic space through the detection of a sound and response by the device.

[0068] In general, personalized sound management applications are customizable point solutions that allow user 202 to handle a variety of tasks associated with managing acoustic space 204. The selection of personalized sound management applications will depend on the person, the device, and the acoustic space being managed. Examples of devices that can use personalized sound management applications with the appropriate hardware and operating system, but not limited to these examples, are earpieces, media devices, and vehicles.

[0069] As described hereinabove, a suite of personalized sound management applications 206 are provided. The user 202 can select the desired applications and have control over their acoustic space 204. The selected applications are stored in ROM 212. Under user control, user 202 selects the parameters of personalized sound management applications 206 using operating system 208 for implementing applications 206 in device 210 for managing acoustic space 204 based on the individual's needs and wants.

[0070] FIG. 3 is a diagram illustrating a module 300 for implementing personalized sound management in accordance with at least one exemplary embodiment. Module 300 comprises an H-Chip™ 302, a ROM 304, an operating system 306, and user selected personalized sound management applications 308. In at least one exemplary embodiment, module 300 comprises the H-Chip™ 302 with ROM 304 built into H-Chip™ 302. Both operating system 306 and user selected personalized sound management applications

308 are stored on ROM 304. Alternately, H-Chip™ 302 and ROM 304 can be separate chips allowing for a larger block of memory.

[0071] H-Chip™ 302 is a microprocessor, DSP, or logic circuit that implements personalized sound management applications 308. H-Chip™ 302 is optimized for low power dissipation while running user selected personalized sound management applications 308. In at least one exemplary embodiment, H-Chip™ 302 can be a dedicated engine for running applications 308.

[0072] Module 300 comprises an application engine (firmware) and a dedicated processor that simplifies the integration of user selected and user controlled personalized sound management applications 308 into a device. In an exemplary embodiment, module 300 is integrated into each device in devices 314. Devices 314 typically, although not always have at least one microphone and at least one speaker. User 310 in conjunction with module 300 can personalize how each device manages sound to the user.

[0073] An additional aspect of module 300 is that a third party manufacturer merely builds the acoustic portion of their device around module 300. In an exemplary embodiment, a manufacturer does not and cannot modify operating system 306 and user selected personalized sound management applications 308. Thus, the manufacturer saves time, effort, and money through the seamless integration module 300 into a single hardware solution for maximum transportability into 3.sup.rd party form factors.

[0074] FIG. 4 is a diagram illustrating a process of providing personalized sound management in accordance with at least one exemplary embodiment. In general, the technology related to providing personalized sound management comprises hardware components and software. In at least one exemplary embodiment, the hardware 402 comprises transducers 404 and H-Chip™ 406.

[0075] Transducers 404 are speaker and microphones for respectively providing and receiving sound in an acoustic space. Depending on the application, the size and form factor of transducers 404 may be a critical design parameter. Transducers 404 can be a speaker for providing high fidelity sound to enhance a user's experience. Similarly, transducers 404 can be a microphone for receiving acoustic information and in some cases can pick up sounds inaudible to the user.

[0076] H-Chip™ 406 can be a microprocessor, digital signal processor, logic circuit, or applications specific integrated circuit for use implementing the software applications listed hereinabove and other programs related to personalized sound management. H-Chip™ 406 includes operating system 408 specific for managing the device as it relates to personalized sound management and allows user control to adjust the parameters of each application for their specific needs.

[0077] Hardware 402 can be integrated into existing devices or next generation devices for adding utility, providing safety, and allowing personalization of a user's acoustic space. Providing hardware 402 enables device manufacturers 410 to rapidly integrate the technology into their products. This will quicken the adoption cycle of the technology for the benefit of the general public in health and safety, and for the individual through personalization. Hardware 402 can be a circuit board to which transducers 404 and H-Chip™ 406 are operatively attached.

[0078] Device manufacturers 410 can provide their own hardware 414 or use transducers 404 and H-Chip™ 406. The operating system and application software is incorporated 412 and stored in read only memory (ROM). In at least one exemplary embodiment, operating system 408 and the application software can be stored in ROM. Using read only memory for storage prevents device manufacturers 410 or consumers from tampering with the software code thereby maintaining the integrity of the system and how it performs for the user. Note herein when referring to ROM storage, at least one exemplary embodiment can include RAM or other read/write storage methods.

[0079] People in the consumer product industry have stated that any new product and even old products in the hands of consumers may produce liability issues that companies associated with the product have to deal with. This often delays an introduction of a product or adds substantial cost to a product launch. In at least one exemplary embodiment, device manufacturers 410 provide their product for certification 416. In at least one exemplary embodiment, certification 416 is performed by an independent company from device manufacturers 410. Certification 416 is a process whereby a new product is exhaustively tested to ensure the device will perform to specification under a variety of conditions and tolerances. In particular, certification 416 tests the operating system and the device performance in implementing the applications related to personal sound management. Should the device not pass certification testing, it can be repaired or redesigned. The repaired or redesigned device can then undergo certification 416 to determine if it meets the test specifications.

[0080] In at least one exemplary embodiment, an insurance policy 418 may be provided covering the device manufacturers 410 using operating system 408, hardware 402, and the application software. This provides substantial benefits in that the device manufacturers 410 can deploy the technology with less risk. Moreover, each company providing devices will know that the personalized sound management system is similar or identical to others in the market. As mentioned hereinabove, the operating system and application software can be stored in ROM ensuring it cannot be rewritten. Additional measures can be taken to determine if the software is being used out of context and shutting down the operation of the device.

[0081] Once tested and certified, device manufacturers 410 can manufacture, market, and sell devices with personalized sound management 424 and be covered from a liability perspective under provisions in the insurance policy 418. A consumer purchases 420 a certified device and may also be covered under the same insurance policy 418 or may have a second policy directed to the consumer. Consumer protected 422 under insurance policy 418 and having certification 416 will instill consumer confidence to the quality and reliability of the device. This will be discussed in greater detail hereinbelow. Thus, this process is very efficient in creating manufacturer adoption of the personalized sound management technology while protecting both device manufacturers 410 and the consumer.

[0082] FIG. 5 is a diagram illustrating application testing in accordance with at least one exemplary embodiment. Device manufacturers 502 develop, prototype, and manufacture products 506. Products 506 include hardware and operating system 504 for running and performing Personalized Sound Management (PSM™) applications 508.

[0083] In at least one exemplary embodiment, hardware and operating system 504 is capable of running

all personalized sound management applications 508. Products 506 may or may not use all of personalized sound management applications 508. Similarly, an end user or customer of products 506 may or may not use all of personalized sound management applications 508.

[0084] Hardware and operating system 504 of products 506 are loaded with all personalized sound management applications 508. The hardware and operating system 504 are exercised in testing 510 to ensure that it can run personalized sound management applications 508 per specification. Product 506 may or may not be tested for all personalized sound management applications 508 depending on the capability of the device. Products 506 will be tested 510 for the implementation of all personalized sound management applications it is capable of running to meet user specifications for the product (i.e. product certification 512). In at least one exemplary embodiment, should a product run only a subset of personalized sound management applications, the product can be designed and tested to lock out the running of applications not specified for the particular product (even though hardware and operating system 504 can run personalized sound management applications 508).

[0085] A scale of economy for developing and manufacturing hardware and operating system 504 is achieved by having a number of different device manufacturers 502 standardize on the engine (hardware and operating system 504) for implementing personalized sound management. Consistency of product, ability to expand scope of product, and lowering cost through volume manufacturing are all achieved by this methodology. In the example where liability insurance may be purchased by the product certification company (or other company) testing 510 all personalized sound management applications 508 in products 506 ensures that hardware and operating system 504 perform per specification independent of the product it is placed in. Furthermore, having little or no variation on the operation of hardware and operating system 504 and personalized sound management applications 508 minimizes risk. An added benefit is that a large statistical database of diversified products is generated that will allow improvements to managing personalized sound management devices to improved device performance as well as lower liability risk. The consumer benefits by having a highly exercised and stable product that improves their health, safety, and quality of life.

[0086] FIG. 6 is a diagram illustrating testing of a personalized sound management product 602 in accordance with at least one exemplary embodiment. In at least one exemplary embodiment, testing of all products incorporating personalized sound management applications are tested by a single entity. Personalized sound management product 602 can be developed and manufactured by a number of different companies. As previously mentioned, this allows the single entity, should it so desire to purchase a liability insurance policy that covers the manufacturers making personalized sound management product 602 and consumers using personalized sound management product 602.

[0087] Personalized sound management product 602 is tested by certification laboratory 604. In at least one exemplary embodiment, certification laboratory 604 is independent from the different manufacturers that develop personalized sound management product 602 thereby providing unbiased testing. Testing 614 of hardware 606, software 608, and manufacturing 610 are performed on personalized sound management product 602. Testing 614 is related to operation and performance of personalized sound management applications. Hardware testing includes the processor, transducers, and other elements, which implement the personalized sound management of the device. Testing of

software 608 includes the operating system and personalized sound management applications. Testing 614 includes reliability 616 and quality 618 testing. Testing 614 can also include human testing because in some embodiments, personalized sound management product may be worn in an orifice of the human body.

[0088] Upon passing testing 614 the personalized sound management product 602 is certified by certification laboratory 604. A product certified 620 can include some form of warranty, indemnification, and liability insurance for the device. Problems or issues with personalized sound management product 602 are reported to the company should it fail for any reasons. Corrective action can be taken and the device retested to determine if the issue has been resolved.

[0089] In at least one exemplary embodiment, certification laboratory 604 or its parent company will brand the product by placing a trademark or company logo on the approved personalized sound management product 602. The trademark or logo represents the incorporation of its personalized sound management technology in the product (hardware, software, and intellectual property) as well as the certification indicating the quality and reliability of the device.

[0090] FIG. 7a is a diagram illustrating a consumer purchase process for a personalized sound management product in accordance with at least one exemplary embodiment. A consumer reviews a number of different devices such as earpieces in a display area. The display area allows the consumer to look, feel, and touch the hardware. The consumer focuses on an earpiece 701 in the display area and wants to learn more about the device.

[0091] A sales person can demonstrate earpiece 701 allowing the consumer to test the functions and performance of the device. A demonstration room or test environment can be used to illustrate performance differentiation when compared to other earpieces. In at least one exemplary embodiment, earpiece 701 is an in-ear device that has a removable and disposable sealing section. This allows consumer testing using earpiece 701 while maintaining a sanitary condition by disposing of the sealing section after each test session.

[0092] The consumer indicates to the sales person that he or she would like to purchase earpiece 701. The sales person accesses a computer that is coupled to server system for completing a purchase transaction. The consumer provides registration information that is entered into a database in a step 703. The consumer or the sales person can enter the information into the database. The registration information 705 comprises information such as personal, financial, business, and preference. Personal information relates to data such as age, sex, home address, telephone number, email address, which identifies the consumer. Financial information relates the consumer's ability to pay such as credit history, credit card for billing, job information, and banking institutions. Business information relates to a business purchase of the component. Similar to above, business identification and business financial information would be entered with the purchase. Preferences relate to things such as how the consumer wants to be contacted (email, phone), do they want to be made aware of upgrades for their device, and other products they might have interest in. Other information or user experiences could also be collected during the registration process.

[0093] The unit selected by the consumer is then entered into the system in a step 707. In at least one exemplary embodiment, the system identifies the unit and provides a listing of the hardware, software, and subsystems that work with the earpiece 701. The consumer can look at the options available in a step 709 and select among these options. In at least one exemplary embodiment, the selection process can be facilitated by topic, occupation, or other characteristics by providing a list of typical user features applied to earpiece 701. For example, the consumer is purchasing earpiece 701 for a multimedia player. Earpiece 701 provides a substantial improvement in noise attenuation, musical clarity, definition, and dynamic range. The consumer is interested in the safety aspect (and selects this topic on the kiosk) provided by earpiece 701 in alerting the user to an emergency event. For example, earpiece 701 can detect and make the user aware of sirens, emergency sounds, alarms, etc. that would be difficult to hear when listening to music. The consumer by looking at the "safety" topic can select appropriate applications software and sonic signatures to alert the user of a safety situation for their specific device. The consumer can continue to look through other topics and select hardware and software that supplements and implements the desired user experience.

[0094] As mentioned previously, the options can be provided in a step 709 in many different formats. Another format of providing options is by occupation. For example, a dentist may be provided a package to outfit the entire office and patients. The earpieces substantially reduce noise related to drilling which are both a psychological barrier for dentistry and a hearing loss mechanism for people working in a dentist office. The occupation package can provide wireless communication between devices allowing dentists, assistants, and patients to talk or listen to music even in a noisy environment. Replaceable in-ear sealing sections would allow the staff to maintain sanitary conditions with each new patient. After reviewing the consumer selects the appropriate hardware and software to personalize their sound space (on the kiosk or computer) in a step 711.

[0095] In at least one exemplary embodiment, the selected application software provided to earpiece 701 is a subscription whereby the consumer pays a monthly fee to use the applications. Alternately, the selected application software can be a license or purchase associated with the earpiece 701 whereby a one time fee is paid. The consumer can discuss the terms of the agreement with the sales person or review the contract on the computer. If the consumer approves, the contract is signed or accepted and an initial payment is made for the hardware and software in a step 713. The consumer can have the subscription payment automatically billed to a credit card or other automatic payment methodology to ensure uninterrupted service.

[0096] The purchased earpiece is then connected via a wired or wireless connection to download the selected software and enabled in a step 715. A wired connection 717 such as a mini USB cable is shown in the illustration. Wired connection 717 connects to a server system having the appropriate software. In at least one exemplary embodiment, the selections from step 711 can be stored in memory and used to direct the downloading of software to the device, verify the software can be used in the device, and that the appropriate software has been loaded.

[0097] FIG. 7b is a diagram illustrating a consumer purchase process for a personalized sound management product in accordance with at least one exemplary embodiment. A consumer 702 can purchase personalized sound management product hardware 704 and personalized sound management

application software 706. Software 706 works with hardware 704 to personalize and manage sound for consumer 702 for providing utility, safety, and health benefits.

[0098] Hardware 704 can range from a complete product such as a communication device, sound device, or earpiece to ancillary components for enhancing the look of the device or adding further hardware features. In the event that consumer 702 purchases hardware 704, customer information 708 is required to continue with purchase. In general, customer name, address, personal information and financial information are typically required to purchase hardware 704. Other information can also be collected through a questionnaire or some form of incentive. Should customer information 708 exist and consumer 702 is in good stead then generating customer information 708 is not required and the order process continues. Any issue that occurs in checking customer information 708 will be brought up for rectification to consumer 702. The hardware 710 that consumer 702 selected is verified and place order 712 is performed.

[0099] Personalized sound management application software 706 is a suite of applications that consumer 702 selects for their specific needs. Once customer information 708 has been established, consumer 708 is provided subscription information 714. Use of personalized sound management application software 706 is based on a periodic fee or subscription (for example, a monthly fee). Subscription information 714 informs consumer 702 as to the periodic subscription fees associated with the software 706, terms of use, bundled packages of applications, and other pertinent information to complete the decision process. Should consumer 702 approve of the terms, a contract 716 is provided to the customer to accept or decline. A bill 718 is generated when an order is placed either through purchasing hardware 710, accepting a subscription to personalized sound management application software 706, or both. In at least one exemplary embodiment, the purchase process is web based allowing consumer 702 to purchase from a client system via a communication path such as the internet or communication network.

[0100] FIG. 8 is a diagram illustrating registering a new device that includes personalized sound management applications in accordance with at least one exemplary embodiment. A new device or unit is received by a customer 802. The manufacturer has loaded the preordered personalized sound management applications chosen by customer 802 into the unit. Typically, customer 802 is going to want to try the unit shortly after receiving it (e.g., the unit is operational for a predetermined period of time 804, for example 1 week). In at least one exemplary embodiment, customer 802 can try the unit for a predetermined time period 804. In general, the time period 804 (for example, 15-30 minutes) is long enough for customer 802 to get a feel for the unit but is not a useful length of time. Furthermore, the unit will notify customer 802 through a transducer on the unit that they must register the device and that the unit will not be usable after the predetermined time period. Note that in at least one exemplary embodiment the customer would have the opportunity to demo certain features (806) not purchased.

[0101] In at least one exemplary embodiment, a website 810 is a portal to register the unit purchased by customer 802. Website 810 can have a web page devoted to registering new devices to simplify the process. Customer 802 may log in (if an account already exists) or provide personal information related to the registering process. A database 812 is accessed that includes both customer and order information in one or more databases. In at least one exemplary embodiment, the unit is in

communication with the device manufacturer server 814 through website 810 or coupled thereto through a customer system.

[0102] Verification 816 verifies that all information is correct and that there are no pending issues 818 with a corrective action identified. The verification process 816 can checks things like device serial number, features and applications ordered by customer 802, personal/financial information. Once verification 816 is complete, it is determined at step 817 whether to register the device. Step 817 proceeds to step 820 if there are no pending issues 818. Registration 820 registers the unit to the owner after verification 816 is complete.

[0103] FIG. 9 is a diagram illustrating enabling a device in accordance with at least one exemplary embodiment. In general, registration 902 links customer information to a device as disclosed in FIG. 8. The registration process includes a comprehensive legally-compliant, state-specific Informed Consent system for collecting and storing the Informed Consent of users.

[0104] In at least one exemplary embodiment, the device will have at least one microphone. In the process of registration 902 the customer voice is recorded by the device. The customer voice can be stored on the device and to the customer database. The customer voice can be used for a number of applications including voice verification to use the device thereby acting as a deterrent for others to use or steal the device.

[0105] As mentioned in FIG. 8 the unit or device can be enabled for a predetermined time period. Prior to enabling the new device, a contract 904 is provided for customer review. The contract outlines the terms of use for using the device and that the product had been certified through a rigorous testing process. In at least one exemplary embodiment, liability coverage may be provided to the customer if the contract is accepted. Having the liability coverage in conjunction with the certification process is powerful in building consumer confidence about personalized sound management.

[0106] At step 905, it is determined whether the contract is accepted. The new device is not enabled 906 if the customer does not accept contract 904. The new device is enabled 908 if the customer accepts contract 904. In at least one exemplary embodiment, the registration and enabling of the unit is through a client system coupled to the business server. Thus, the unit is enabled remotely.

[0107] FIG. 10 is a diagram illustrating updating a unit or device in accordance with at least one exemplary embodiment. The device is enabled for use. In general, instructions or an operational video may be provided for a user to get acquainted with the device. Even with this help, a device may have so many features and applications that the user could get overwhelmed or frustrated trying to understand and operate the unit. In some cases, a user may not want even try to learn how to operate all the features and initially start out with the application that provides significant utility to the user. The user may never address learning how to use all the capabilities of the device. Moreover, misuse of a device can lead to dangerous operating conditions that could cause a serious or harmful situation.

[0108] Acclimation 1002 is a process to ensure that a user of a device appreciates the entire feature set but more particularly, enables the features in a way that ensures proper usage in a safe and structured

manner. In at least one exemplary embodiment, acclimation 1002 comprises two components, a learning module and a reminder module. The learning module is a system that "teaches" the user of the device the functional components of the device. In at least one exemplary embodiment, the learning module may incorporate a learning system that evaluates the user in the domain of a particular competency before certain functions or features of the device are enabled. For example, features of the device are enabled sequentially, either automatically after the user has utilized a particular function for a predetermined time (thereby showing competency in using the feature) or following a user competency evaluation, which can be invoked either manually (when the user is confident in using the feature) or automatically.

[0109] The reminder module may or may not be used in acclimation 1002. The reminder serves to remind the user of the correct usage of features and also serves to remind the user of other features on the device which the user may not have used in a given time period. In at least one exemplary embodiment an evaluation is invoked based on a predetermined time period. The evaluation may be for a single function or feature or a combination of different functions. The predetermined time period before evaluating can vary depending on the function. Alternatively, the evaluation may be invoked based on a particular recent event, such as a software upgrade, or a detected change in user usage. If the user passes the evaluation, the evaluation may be repeated, the relevant learning mode for the corresponding function to which the users competency was evaluated may be repeated, or the corresponding function to which the users competency was evaluated may be disabled. Thus, acclimation 1002 allows a user to learn the device at a friendly pace, ensures that the user does know how to use a feature, and protects the user from using the device in a manner that could be harmful.

[0110] The device can be coupled 1004 from a client system to the business server to update software on the device or purchase new hardware and software. As disclosed hereinabove, the user information is checked to determine if there are any issues that need to be rectified (e.g. missed payment, user does not match to device, etc. . . .). In the event that the issues cannot be rectified the device is disabled in a step 1006. In at least one exemplary embodiment, the user information, device, and personalized sound management applications correlate. The server checks for updates 1008 for the device and downloads updates to the device. The user goes through a similar process as described in FIGS. 7A-7B for a hardware or software purchase 1010 including agreeing to a contract to subscribe and contract to terms of use as described in FIG. 9.

[0111] FIG. 11 is a diagram illustrating a device for implementing personalized sound management in accordance with at least one exemplary embodiment. The device is generally indicated as an earpiece that partially seals or seals a user's ear canal 1124 and is constructed and operates in accordance with at least one exemplary embodiment of the invention. As illustrated, the earpiece comprises an electronic housing unit 1100 and a sealing unit 1108. The earpiece depicts an electro-acoustical assembly for an in-the-ear acoustic assembly, as it would typically be placed in an ear canal 1124 of a user 1130. The earpiece can be an in the ear earpiece, behind the ear earpiece, receiver in the ear, partial-fit device, or any other suitable earpiece type. The earpiece can partially or fully occlude ear canal 1124, and is suitable for use with users having healthy or abnormal auditory functioning.

[0112] The earpiece includes an Ambient Sound Microphone (ASM) 1120 to capture ambient sound, an

Ear Canal Receiver (ECR) 1114 to deliver audio to an ear canal 1124, and an Ear Canal Microphone (ECM) 1106 to capture and assess a sound exposure level within the ear canal 1124. The earpiece can partially or fully occlude the ear canal 1124 to provide various degrees of acoustic isolation. In at least one exemplary embodiment, the assembly is designed to be inserted into the user's ear canal 1124, and to form an acoustic seal with the walls of the ear canal 1124 at a location between the entrance to the ear canal 1124 and the tympanic membrane 1126 (or ear drum). In general, such a seal is typically achieved by means of a soft and compliant housing of sealing unit 1108.

[0113] Sealing unit 1108 is an acoustic barrier having a first side corresponding to ear canal 1124 and a second side corresponding to the ambient environment. In at least one exemplary embodiment, sealing unit 1108 includes an ear canal microphone tube 1112 and an ear canal receiver tube 1110. Sealing unit 1108 creates a closed cavity of approximately 5 cc between the first side of sealing unit 1108 and the tympanic membrane 1126 in ear canal 1124. As a result of this sealing, the ECR (speaker) 1114 is able to generate a full range bass response when reproducing sounds for the user. This seal also serves to significantly reduce the sound pressure level at the user's eardrum 1126 resulting from the sound field at the entrance to the ear canal 1124. This seal is also a basis for a sound isolating performance of the electro-acoustic assembly.

[0114] In at least one exemplary embodiment and in broader context, the second side of sealing unit 1108 corresponds to the earpiece, electronic housing unit 1100, and ambient sound microphone 1120 that is exposed to the ambient environment. Ambient sound microphone 1120 receives ambient sound from the ambient environment around the user.

[0115] Electronic housing unit 1100 houses system components such as a microprocessor 1116, memory 1104, battery 1102, ECM 1106, ASM 1120, ECR 1114, and user interface 1122. Microprocessor 1116 (or processor 1116) can be a logic circuit, a digital signal processor, controller, or the like for performing calculations and operations for the earpiece. Microprocessor 1116 is operatively coupled to memory 1104, ECM 1106, ASM 1120, ECR 1114, and user interface 1122. A wire 1118 provides an external connection to the earpiece. Battery 1102 powers the circuits and transducers of the earpiece. Battery 1102 can be a rechargeable or replaceable battery.

[0116] In at least one exemplary embodiment, electronic housing unit 1100 is adjacent to sealing unit 1108. Openings in electronic housing unit 1100 receive ECM tube 1112 and ECR tube 1110 to respectively couple to ECM 1106 and ECR 1114. ECR tube 1110 and ECM tube 1112 acoustically couple signals to and from ear canal 1124. For example, ECR 1114 outputs an acoustic signal through ECR tube 1110 and into ear canal 1124 where it is received by the tympanic membrane 1126 of the user of the earpiece. Conversely, ECM 1106 receives an acoustic signal present in ear canal 1124 through ECM tube 1112. All transducers shown can receive or transmit audio signals to a processor 1116 that undertakes audio signal processing and provides a transceiver for audio via the wired (wire 1118) or a wireless communication path.

[0117] The earpiece can actively monitor a sound pressure level both inside and outside an ear canal 1124 and enhance spatial and timbral sound quality while maintaining supervision to ensure safe sound reproduction levels. The earpiece in various embodiments can conduct listening tests, filter sounds in

the environment, monitor warning sounds in the environment, present notification based on identified warning sounds, maintain constant audio content to ambient sound levels, and filter sound in accordance with a Personalized Hearing Level (PHL).

[0118] The earpiece can generate an Ear Canal Transfer Function (ECTF) to model the ear canal 1124 using ECR 1114 and ECM 1106, as well as an Outer Ear Canal Transfer function (OETF) using ASM 1120. For instance, the ECR 1114 can deliver an impulse within the ear canal 1124 and generate the ECTF via cross correlation of the impulse with the impulse response of the ear canal 1124. The earpiece can also determine a sealing profile with the user's ear to compensate for any leakage. It also includes a Sound Pressure Level Dosimeter to estimate sound exposure and recovery times. This permits the earpiece to safely administer and monitor sound exposure to the ear.

[0119] In at least one exemplary embodiment, the earpiece has a number of sonic signatures stored in memory. ASM 1120 is providing acoustic information from the ambient environment to processor 1116. Processor 1116 analyses the acoustic information for a sound similar to the sonic signature. Once identified, the earpiece will provide a response to the sound based on the application. In a first exemplary embodiment, the earpiece will reduce music or telephone call (or the dominant source of sound being provided by the earpiece) and amplify the identified signal (ambulance or police car) thereby notifying the user of the approaching vehicle. In a second exemplary embodiment, the earpiece will tell the user (through a synthesized voice) that an ambulance or police car is approaching including the direction of the vehicle. The earpiece can also provide the identified signal with the voice warning. Other variations are possible.

[0120] Conversely, the earpiece can perform the opposite operation. The earpiece can identify a signal similar to the sonic signature and then attenuate it before providing it through ECR 1114. For example, the user of the earpiece is a gun enthusiast. The user downloads a sonic signature related to a gun shot. The earpiece upon identifying the sound of the gun shot would attenuate the portion of the acoustic information provided by ASM 1120 similar to the sonic signature of the gun shot while allowing other signals to come through. Thus, the user could engage in a conversation at the gun range with the gun shot sounds attenuated while passing the conversation through the earpiece thereby protecting his ear from the loud sounds in this environment and being able to hear the conversation with more clarity.

[0121] In at least one exemplary embodiment, the earpiece can manually or automatically record, measure sound pressure levels, attach metadata (including time stamp and geocode), and upload the information when a communication path is present to a sound database. The earpiece is capable of running personalized sound management software disclosed herein. Moreover, hardware ingredients such as the transducers (ECR 1114, ASM 1120, and ECM 1106), processor 1116, and sealing unit 1108 are provided to manufacturers as disclosed in FIG. 3 for allowing a variety of companies to manufacture devices of their own earpiece designs. It should be noted that although an earpiece is used as an example of a personalized sound management device the components can be used in other communication devices and sound devices to personalize control of the sound.

[0122] In at least one exemplary embodiment, sealing section 1108 is a replaceable unit. Sealing section 1108 can pull out and be replaced as a unit. Sealing section 1108 performance can degrade over time

due to particulate build up. There may also be sanitary or health reasons for replacing sealing section 1108 periodically. In at least one exemplary embodiment, sealing section 1108 replacement parts can be provided as part of a periodic subscription fee to a user, purchased over the counter in a store, or purchased through a web environment.

[0123] FIG. 12 is a block diagram of a device for implementing personalized sound management in accordance with at least one exemplary embodiment. A power supply 1205 powers components of the earpiece including microprocessor/DSP 1206 (or processor 1206) and a data communication system 1216. As illustrated, the earpiece can include the processor 1206 operatively coupled through a data communication system 1216 to an ASM 1210, an ECR 1212, and ECM 1208. Data communication system 1216 can include one or more Analog to Digital Converters and Digital to Analog Converters (DAC). The processor 1206 can utilize computing technologies such as a microprocessor, Application Specific Integrated Chip (ASIC), and/or digital signal processor (DSP) with associated Random Access Memory (RAM) 1202 and Read Only Memory 1204. Other memory types such as Flash, non-volatile memory, SRAM, DRAM or other like technologies can be used for storage with processor 1206. The processor 1206 can also include a clock to record a time stamp.

[0124] In general, a data communication system 1216 is a communication pathway to components of the earpiece and components external to the earpiece. The communication link can be wired or wireless. In at least one exemplary embodiment, data communication system 1216 is configured to communicate with ECM assembly 1208, ASM assembly 1210, visual display 1218, and user control interface 1214 of the earpiece. As shown, user control interface 1214 can be wired or wirelessly connected. In at least one exemplary embodiment, data communication system 1216 is capable of communication to devices exterior to the earpiece such as the user's mobile phone 1232, a second earpiece 1222, and a portable media player 1228. Portable media player 1228 can be controlled by a manual user control 1230.

[0125] The user's mobile phone includes a mobile phone 1232 communication system 1224. A microprocessor 1226 is operatively coupled to mobile phone communication system 1224. As illustrated multiple devices can be wirelessly connected to one another such as an earpiece 1220 worn by another person to the user's mobile phone 1232. Similarly, the user's mobile phone 1232 can be connected to the data communication system 1216 of the earpiece as well as the second earpiece 1222. This connection would allow one or more people to listen and respond to a call on the user's mobile phone 1232 through their respective earpieces.

[0126] As illustrated, a data communication system 1216 can include a voice operated control (VOX) module to provide voice control to one or more subsystems, such as a voice recognition system, a voice dictation system, a voice recorder, or any other voice related processor. The VOX module can also serve as a switch to indicate to the subsystem a presence of spoken voice and a voice activity level of the spoken voice. The VOX can be a hardware component implemented by discrete or analog electronic components or a software component. In one arrangement, the processor 1206 can provide functionality of the VOX by way of software, such as program code, assembly language, or machine language.

[0127] ROM 1204 can be used to store personalized sound management applications to minimize the possibility of modification and tampering of the code. The RAM 1202 can also store program instructions for execution on the processor 1206 as well as captured audio processing data. For instance, memory RAM 1202 and ROM 1204 can be off-chip and external to the processor 1206 and include a data buffer to temporarily capture the ambient sound and the internal sound, and a storage memory to save from the data buffer the recent portion of the history in a compressed format responsive to a directive by the processor. The data buffer can be a circular buffer that temporarily stores audio sound at a current time point to a previous time point. It should also be noted that the data buffer can in one configuration reside on the processor 1206 to provide high speed data access. The storage memory can be non-volatile memory such as SRAM to store captured or compressed audio data. The non-volatile memory could also be used to store sonic signatures.

[0128] Data communication system 1216 can include an audio interface operatively coupled to the processor 1206 and the VOX to receive audio content, for example from portable media player 1228, cell phone 1232, or any other communication device, and deliver the audio content to the processor 1206. The processor 1206 responsive to detecting voice-operated events from the VOX can adjust the audio content delivered to the ear canal of the user of the earpiece. For instance, the processor 1206 (or the VOX of data communication system 1216) can lower a volume of the audio content responsive to detecting an event such as a sonic signature for transmitting the acute sound to the ear canal of the user. The processor 1206 by way of the ECM 1208 can also actively monitor the sound exposure level inside the ear canal and adjust the audio to within a safe and subjectively optimized listening level range based on voice operating decisions made by the VOX of data communication system 1216.

[0129] The earpiece and data communication system 1216 can further include a transceiver that can support singly or in combination any number of wireless access technologies including without limitation Bluetooth™, Wireless Fidelity (WiFi), Worldwide Interoperability for Microwave Access (WiMAX), and/or other short or long range communication protocols. The transceiver can also provide support for dynamic downloading and uploading over-the-air to the earpiece. It should be noted also that next generation access technologies also can be applied to the present disclosure.

[0130] Data communication system 1216 can also include a location receiver that utilizes common technology such as a common GPS (Global Positioning System) receiver that can intercept satellite signals and therefrom determine a location fix of the earpiece and provide a geocode as an identifier for a recording or measurement such as sound pressure level.

[0131] The power supply 1205 can utilize common power management technologies such as replaceable batteries, supply regulation technologies, and charging system technologies for supplying energy to the components of the earpiece and to facilitate portable applications. A motor (not shown) can be a single supply motor driver coupled to the power supply 1205 to improve sensory input via haptic vibration. As an example, the processor 1206 can direct the motor to vibrate responsive to an action, such as a detection of a warning sound or an incoming voice call.

[0132] The earpiece can further represent a single operational device or a family of devices configured in a master-slave arrangement, for example, a mobile device and an earpiece. In the latter embodiment,

the components of the earpiece can be reused in different form factors for the master and slave devices.

[0133] FIG. 13 is a diagram of a communication device 1302 or earpiece 1310 configured to provide sonic signatures to sonic signature database 1308 in accordance with at least one exemplary embodiment. Collecting a large number of sounds around the world is a daunting task. As mentioned previously, no group or business entity would have the ability to acoustically map the world on a continuous basis. In at least one exemplary embodiment, the collection of sonic signatures is achieved by mobilizing as many people as possible by making it simple to capture and provide a sound for sonic signature database 1308. This is achieved by adapting a common device having a potential of reaching billions of people for manually or automatically capturing sonic signatures and providing them to database 1308.

[0134] In at least one exemplary embodiment, communication device 1302 is a mobile communication device having a microphone for receiving sound. Examples of a communication device 1302 are a phone, cell phone, PDA, computer, two way radio, smart phone, and earpiece. Earpiece 1310 includes a microphone for capturing sound and the circuitry disclosed in FIG. 12. Earpiece 1310 is operably configured for recording sound and measuring sound pressure levels. The acoustic information received from the microphone of earpiece 1310 is recorded to memory residing in earpiece 1310 and tagged with metadata including a time stamp and geocode. The sound pressure level (SPL) is measured from the microphone signal through analog or digital signal processing typically before any audio processing occurs within earpiece 1310. The SPL measurement of this recorded event is associated to the stored recording and metadata. Similarly, communication device 1302 is adapted for capturing sound 1312 including recording, measuring sound pressure level, storing, and tagging with metadata (including a time stamp and geocode). In at least one embodiment, communication device 1302 could have additional circuitry similar to that in FIG. 12 in the device specifically for generating a sonic signature database. Alternately, the circuitry within communication device 1302 can be adapted for recording sound and measuring sound pressure level. In particular, mechanical aspects of the communication device such as microphone placement, microphone porting, as well as electronic audio processing (automatic gain control, equalization, etc. . . .) is taken into account for ensuring an accurate sound pressure level measurement and recording.

[0135] In at least one exemplary embodiment, a user having communication device 1302 manually or automatically captures and provides a sonic signature to a sonic signature database 1308. For example, a microphone on communication device 1302 is always enabled for receiving sound. The sound can be stored in a buffer. The sound in the buffer is analyzed and based on a variety of criteria can be configured to be provided to database 1308. For example, criteria such as sound pressure level, time, frequency of sound, geographic location, or recognition of a sound (sonic signature detection) are but a few of the parameters that could be used to determine that the sound in the buffer is worthy of saving. Metadata is automatically attached such as a time stamp and geocode but the user can also add information. In at least one exemplary embodiment, a communication path 1304 is opened and a link is made to website 1306 and more particularly to database 1308 where the stored sounds can be automatically uploaded. In at least one exemplary embodiment, the sonic signature, sound pressure level, and metadata could be immediately sent if a communication path 1304 is available to save

memory. Further communication between website 1308 and the user of communication device 1302 or earpiece 1310 can take place to edit, identify, describe, and format the provided sound 1312 at a more convenient time. It should be noted that video information that includes audio information can also be provided in similar fashion as disclosed hereinabove. The audio information from the video can be used for sonic signature database 1308.

[0136] Earpiece 1310 and communication device 1302 can be operably coupled together. A priority could be set up such that earpiece 1310 is the primary recorder of sound 1312 when enabled by the user. Earpiece 1310 can be used with other devices for example a portable media player. Earpiece 1310 can automatically or manually record, measure SPL, and tag metadata of sound 1312 as described hereinabove. The sonic signatures stored in earpiece 1310 could be sent to website 1306 and sonic signature database 1308 if earpiece 1310 is coupled to a communication path 1304 or through another device to which it is operably coupled that has a communication path. Alternately, the sonic signatures could be uploaded via website 1306 and sonic signature database 1308 at a more convenient time, for example a wired or wireless link to the user's personal computer at home, allowing the user to also provide additional metadata before providing the information. Thus, a common device has been provided that is adapted for capturing, storing, measuring SPL, adding metadata including a time stamp and geocode, and uploading the acoustic information to a database thereby including the broadest number of people across the largest geographic area for sound collection on a continuous basis.

[0137] FIG. 14 is a block diagram illustrating a cell phone 1404 capturing a sonic signature and providing the sonic signature to a database of sounds 1418 in accordance with at least one exemplary embodiment. Cell phone 1404 is enabled for capturing a sonic signature via an exclusive button or through an automatic process. In at least one exemplary embodiment, the user can select whether a sound is recorded, a sound pressure level measurement is recorded, or both are acquired. A default can be that both are acquired automatically.

[0138] A sound 1402 is received by a microphone on cell phone 1404 and stored in a buffer in a record sounds step 1406. The sound in the buffer is analyzed and determined to be saved. The sound pressure level (SPL) of the sonic signature is measured or calculated in a measure SPL step 1408. The user can also manually enter metadata 1410 via a keyboard to a metadata table or can enter vocal description in an attached audio stream. Metadata 1410 includes a time stamp and a geocode corresponding to the sonic signature.

[0139] In at least one exemplary embodiment, the sonic signature, sound pressure level, and metadata can be stored in memory 1412 that resides on cell phone 1404. A queue of sonic signatures 1414 can be stored in memory 1412 for uploading at an appropriate time. The user can initiate uploading of the queue of sonic signatures 1414 to database of sounds 1418 when a communication path is completed. In at least one exemplary embodiment, cell phone 1404 can automatically connect 1416 to servers in database of sounds 1418 and upload queue of sonic signatures 1414 when a communication path is enabled. Although stored on database of sounds 1418, there may be an iterative process to determine if the sonic signatures are in the correct format or are unique enough to be permanently stored. Thus, a large database of sounds 1418 can be collected world wide by an automatic process using a common device such as a cell phone that could not be accomplished by direct means. In at least one exemplary

embodiment, the database of sounds 1418 is used in conjunction with personalized sound management applications configured to provide sonic signatures for identifying and providing a response to the identified sound.

[0140] To encourage retailers to actively engage and participate in selling Hearium Labs branded products, a business model has been developed based on an annuity revenue sharing methodology. Through this patent pending approach, for the first time, retailers, operators and other suppliers will be able to carry a single audio earpiece or other device in their stores that can be sold to a wide and deep range of consumers. Utilizing an "iPod/iTunes" approach, suppliers will earn profit off the sale of the hardware in store and Personalized Sound Management applications at and after the point of sale. As the consumer continues to personalize their earpiece or device over time, the supplier will earn residuals of up to 50% of the application revenues through a co-operative sharing program between them and Hearium Labs.

[0141] To accomplish this, Hearium Labs has enabled the hardware solution to work off of a webified environment that is being architected with commercial flexibility for consumer driven point of sale purchase and activation. This approach allows for the Personalized Sound Management applications to be remotely downloaded and activated on the hardware through any Internet equipped PC and web-based browser. Consumers will thus be able to "enhance" their devices by adding both purchased and subscription applications and personalize their experience with technology designed to acclimate devices to the wearer and their environment.

[0142] In general, a process has been provided that eliminates barriers for mass adoption of a new technology. The result is that the technology can be provided by a number of manufacturers thereby having ubiquitous availability at release. Universal compatibility is also provided by using the same hardware and software in each new product having personalized sound management. Certification ensures that each device is manufacturable and performs to specification. Manufacturers and consumers benefit because liability coverage may be provided. Consumers can adapt to the technology rapidly through an acclimation process.

[0143] While the present invention has been described with reference to exemplary embodiments, it is to be understood that the invention is not limited to the disclosed exemplary embodiments. The scope of the following claims is to be accorded the broadest interpretation so as to encompass all such modifications and equivalent structures and functions.

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

APPLICATION NO. : UNKNOWN CONFIRMATION NO. unknown
APPLICATION OF : Steven Goldstein
DATE FILED : 16 Mar. 2021
EXAMINER : UNKNOWN
TC/A.U. : UNKNOWN
DOCKET : CONT-16671689
TITLE : PERSONALIZED SOUND MANAGEMENT AND METHOD

TRANSMITTAL WITH CONTINUATION

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

Date: 16 Mar. 2021

Sir:

Please find herein an application for a continuation claiming priority to 16/671,689, filed 1 Nov. 2019. Support for the claims filed with the continuation can be found in paragraphs [0093], [0126], and [0128].

Respectfully submitted,
TECHIYA LLC

Date: March 16, 2021

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and Chief Technical Officer
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Reg. No. 56,389
571-606-1291

SCORE Placeholder Sheet for IFW Content

Application Number: 17203731

Document Date: 03/16/2021

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