

**TITLE: Power Control for Battery Powered Personal Area Network Device
System and Method**

5 **PRIORITY STATEMENT**

 This application claims priority to U.S. Provisional Patent Application No. 62/211,767, filed August 29, 2016, hereby incorporated by reference in its entirety.

BACKGROUND

10 **I. Field of the Disclosure**

 The present invention relates to wireless electronics and battery systems. More specifically, but not exclusively, the present invention relates to wireless earpieces that manage and extend battery life.

15 **II. Description of the Art**

 The growth of wearable devices is increasing exponentially. This growth is fostered by the decreasing sizes of microprocessors, circuit boards, chips, and other components. Wearable devices are necessarily dependent upon their batteries in order to complete their desired function. The overall utility of wearable devices is directly
20 proportional to the battery life of the devices. If the battery life is poor, the user interface and user experiences suffers as too much time and attention are required for retrieving the device, recharging or replacing the battery, and repositioning the wearable device. Operation and conservation of the battery life of the wearable device may be further complicated if the there is no inclusion of an on/off button or switch to conserve precious
25 battery life.

SUMMARY OF THE DISCLOSURE

The illustrative embodiments provide a system and method for managing wireless earpieces. Circuitry of the wireless earpieces are powered utilizing a high power mode in response to detecting a magnetic field is not applied to one or more of the wireless earpieces. The power sent to the circuitry of the wireless earpieces is altered to a low power mode in response to detecting the magnetic field is applied to one or more of the wireless earpieces.

Another embodiment provides a wireless earpiece. The wireless earpiece includes circuitry for operating the wireless earpiece. The wireless earpiece also includes a battery for powering the circuitry of the wireless earpiece. The wireless earpiece further includes a reed switch connecting the battery to the circuitry. The reed switch connects the circuitry to the battery when a magnetic field is not detected. The reed switch disconnects the circuitry from the battery when a magnetic field is detected.

Yet another embodiment provides a wireless earpiece comprising a processor for executing a set of instructions and a memory for storing the set of instructions. The set of instructions are executed to power circuitry of the wireless earpiece in a high power mode utilizing an onboard battery in response to a reed switch not detecting a magnetic field and powering the circuitry to a low power mode in response to detecting the magnetic field is applied to the reed switch.

According to another aspect, a smart case including a smart case housing, a first receptacle for receiving a left earpiece disposed within the smart case housing, a second receptacle for receiving a right earpiece disposed within the smart case housing, and a first interface associated with the first receptacle for electrically connecting the smart case to the left earpiece. The smart case further includes a second interface associated with the second receptacle for electrically connecting the smart case to the right earpiece, and an intelligent control disposed within the smart case housing and operatively connected to the first interface and the second interface. The smart case may include at least one manual input operatively connected to the intelligent control. The smart case may include at least one display operatively connected to the intelligent control. The smart case may include a

display that is moveably connected to the smart case housing such that the display transitions from a first position to a second position.

5 **BRIEF DESCRIPTION OF THE DRAWINGS**

Illustrated embodiments of the present invention are described in detail below with reference to the attached drawing figures, which are incorporated by reference herein, and where:

Fig. 1 is a pictorial representation of a smart case and wireless earpieces in
10 accordance with an illustrative embodiment;

Fig. 2 is a top view of the smart case of FIG. 1 in accordance with an illustrative embodiment;

Fig. 3 is a side view of the smart case of FIG. 1 in accordance with an illustrative embodiment; and

15 Fig. 4 is a block diagram of a smart case in accordance with an illustrative embodiment; and

Fig. 5 is a flowchart of a process for utilizing wireless earpieces with a smart case in accordance with an illustrative embodiment.

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DETAILED DESCRIPTION OF THE DISCLOSURE

The illustrative embodiments provide a system, method, and wireless earpieces for managing and preserving battery life. The wireless earpieces may interact with a smart case to perform various actions. For example, the smart case may be utilized to preserve
25 the battery life of the wireless earpieces by interacting with the wireless earpieces while in a low power mode or state. In addition, the smart cases may ensure that the wireless earpieces are charged to a desired level. Charging may be performed utilizing contact or wirelessly (e.g., inductive charging). The smart case may communicate with the wireless earpieces through physical interactions (e.g., magnetic contact points, physical switches,

etc.) or through wireless connections, standards, or protocols (e.g., near field communications, Bluetooth, Wi-Fi, etc.). The wireless earpieces may upload, synchronize, or store biometric and performance data associated with the wireless earpieces and/or associated user to the smart case.

5 In one embodiment, a reed switch may be utilized in the wireless earpieces to activate and deactivate each of the wireless earpieces. The reed switch is an electrical switch operated by an applied magnetic field. The magnetic field may be provided by a magnet of the smart case thereby turning the wireless earpieces on and off. The integration of the reed switches in the wireless earpieces may reduce the need for costly device
10 components or interfaces. As a result, the weight and footprint of the wireless earpieces may be reduced significantly while increasing the ease of use for the users of the wireless earpieces.

Turning now to Figs. 1-3, these figures show a pictorial representation of a smart case 102 and wireless earpieces 142, 144 in accordance with an illustrative embodiment.
15 The smart case 102 may be an open or enclosed case for securing, charging, and managing the wireless earpieces 142, 144. The wireless earpieces 142, 144 may be referred to as a pair (wireless earpieces) or singularly (wireless earpiece). The description may also refer to components and functionality of each of the wireless earpieces 142, 144 collectively or individually. In one embodiment, the wireless earpieces 142, 144 include a set of left and
20 right ear pieces configured to fit into a user's ears. The wireless earpieces 142, 144 may be configured to play music or audio, receive and make phone calls or other communications, read user biometrics and actions (e.g., heart rate, motion, sleeping, etc.).

In another embodiment, the wireless earpieces 142, 144 may represent wireless devices that may be ingested or implanted into a user. For example, the smart case 102
25 may be configured to work with an endoscopic pill, pacemaker, tracking device, contact lenses, oral implants, bone implants, artificial organs, or so forth. The smart case 102 may act as a logging tool for receiving information, data, or measurements made by the wireless devices. For example, the smart case 102 may be attached to a belt or worn by the user to download data from the wireless device(s) in real-time. As a result, the smart case 102

may be utilized to store, charge, and synchronize data for the wireless earpieces 142, 144 in any number of embodiments.

The smart case 102 encloses a battery, and various other circuitry (not shown). The battery of the smart case 102 may be utilized to charge the wireless earpieces 142, 144 through direct contact or wirelessly. As a result, the smart case 102 may act as a custom charger for ensuring the proper power management and functionality of the wireless earpieces 142, 144. For example, the battery of the smart case 102 may be utilized to charge the wireless earpieces 142, 144 any number of times before the smart case 102 and corresponding battery may require charging. In one embodiment, the smart case 102 may include one or more solar panels, or surfaces configured to charge the smart case 102 utilizing ambient or direct sunlight. The smart case 102 ensures that the duty cycle of the wireless earpieces 142, 144 are maximized by properly maintaining power levels. For example, the smart case 102 may keep the wireless earpieces 142, 144 fully charged during a time period of inactivity, such as before being purchased (e.g., on a shelf or as part of inventory) or once purchased.

In one embodiment, the smart case 102 include a frame 103. The frame 103 is a support structure for the components of the smart case 102 and may be formed of a rigid plastic, polymer, or other similar material. However, any number of other suitable materials, such as composites, rubber, wood, metal, or so forth, may be utilized. The frame 103 defines receptacles 104, 106 that are configured to receive the wireless earpieces 142, 144, respectively. In one embodiment, the receptacles 104, 106 are shaped to fit the external size, shape, and configuration of the wireless earpieces 142, 144.

As a result, an interference fit may secure the wireless earpieces 142, 144 within the frame 103 while the smart case 102 is being moved or otherwise utilized. In one embodiment, the smart case 102 may include a hinged, magnetic, sleeve, or snap on lid or cover that may cover the wireless earpieces 142, 144 when positioned within the receptacles 104, 106 of the smart case 102. For example, the cover may make the smart case 102 waterproof and further secure the wireless earpieces 142, 144. In another embodiment, the smart case 102 may also include a removable cover (e.g., neoprene, zip

up, snapping, etc.). In yet another embodiment, the cover encases a screen, such as a touch screen. The screen may roll, bend or adapt to the shape and configuration of the smart case 102. The touch screen may also be transparent. The screen may be movably connected to the to the smart case to transition from a first position to a second position by sliding,
5 gliding or through other movement.

The smart case includes interfaces 108, 110 within the receptacles 104, 106. The interfaces 108, 110 are hardware interfaces for electrically connecting the wireless earpieces 142, 144 to the smart case 102. The interfaces 108, 110 may include any number of contact points, busses, wires, or other physical connectors for interfacing the wireless
10 earpieces 142, 144, with the smart case 102. The interfaces 108, 110 may alternatively include inductive chargers for charging the wireless earpieces 142, 144. In one embodiment, the interfaces 108, 110 are magnetic for automatically coupling with contact points or interfaces of the wireless earpieces 142, 144. In another embodiment, the interfaces 108, 110 may represent male (or alternatively female) connectors for interfacing
15 with the wireless earpieces 142, 144, such as micro-USB, or other developing miniature external connectors. The interfaces 108, 110 may be utilized to charge the wireless earpieces 142, 144. Wireless charging is also contemplated utilizing an inductive charger integrated in the smart case 102 or other charging devices compatible with the wireless earpieces 142, 144. The interfaces 108, 110 may also be utilized to synchronize data
20 between the wireless earpieces 142, 144.

In one embodiment, the interfaces 108, 110 may each include a magnet that activates the corresponding reed switch (i.e., reed switch 146 described below) to power off or initiate a low power mode (e.g., lower power state or mode) for one or both of the wireless earpieces 142, 144 when one or more of the wireless earpieces 142, 144 are placed
25 within the receptacles 104, 106. In another embodiment, the wireless earpieces 142, 144 and the smart case 102 may interact to control a device reset function. For example, the wireless earpieces 142, 144 may synchronize captured data with the smart case 102 before moving to a low power mode in anticipation of being charged. A switch may be activated mechanically, magnetically, inductively, electrically, or wirelessly to move the wireless

earpieces 142, 144 to a low power mode in anticipation of being charged. Control of the wireless earpieces 142, 144 may be independent for each of the wireless earpieces 142, 144, subject to control one of the wireless earpieces designated as a master device, controlled by the smart case, or may be shared between devices.

5 The smart case 102 may also include a port 112. The port 112 may be utilized to interface with the smart case 102. For example, the port 112 may be utilized with a connector to charge the battery of the smart case 102. The port 112 may also be utilized to download or upload data stored by the smart case 102 that may have previously been stored in the wireless earpieces 142, 144. The port 112 may be a miniaturized port, such as
10 USB Type C, micro-USB, or other miniaturized port suitable for connecting to another electronic device, such as a wall charger, desktop computer, laptop, or wireless device (e.g., smart phone, tablet, etc.). In another embodiment, the smart case 102 may include a dedicated port for charging, such as for receiving a male direct-current (DC) connector.

 In one embodiment, the interfaces, 108, 110 or another portion of the smart case
15 102 as well as the wireless earpieces 142, 144 may include a near field communication (NFC) chip for communications. For example, NFCs may be utilized to determine the wireless earpieces 142, 144 are proximate the smart case 102 for performing power management as is herein described. NFC may also be utilized to identify the wireless earpieces 142, 144 associated with a particular smart case 102. In other embodiments,
20 different communications protocols (e.g., Bluetooth, Wi-Fi, etc.), standards, or passive readers (e.g., radio frequency identification tags, etc.) may be utilized for the wireless earpieces 142, 144 to communicate with the smart case 102. For example, the wireless earpieces 142, 144 may initiate a change in a power state in response to being placed in or near the smart case 102. The smart case 102 may be programmed with a threshold distance
25 (e.g., 10 cm, 1 foot, etc.) to determine when the wireless earpieces 142, 144 are proximate the smart case 102 or may rely on the inherent maximum communications distances of the wireless standard or protocol being utilized (e.g., NFC, RFID, etc.). In another embodiment, biometric readings, such as heart beat or temperature may be utilized by the wireless earpieces 142, 144 and smart case 102 to alter the power mode or status of the

wireless earpieces 142, 144, as well as the smart case 102 (e.g., may be placed in a low power mode). For example, if the wireless earpieces 142, 144 are near the smart case 102 and no heart beat is detected, the smart case 102 may send a command for the wireless earpieces 142, 144 to shut themselves down or enter a low power mode with minimum
5 functionality. In one embodiment, power to onboard sensory arrays may be terminated and only essential functions remain on. For example, in the low power mode allows charging of the wireless earpieces 142, 144 and/or smart case 102 and uploads/downloads to the wireless earpieces 142, 144 while in the low power mode.

The wireless earpieces 142, 144 may each include a reed switch 146. The reed
10 switch 146 may operate in a closed mode 148 when no magnetic field is present or in an open mode 150 when a magnetic field is present. The magnetic field may be supplied by one or more magnets of the smart case, such as magnet 114. As a result, the reed switch 146 may be in the closed mode 148 when outside the smart case 102 and in the open mode 150 when in the smart case 102.

In one embodiment, the magnet 114 may be integrated in a sidewall of the
15 receptacle 104. Each of the receptacles 104, 106 may include magnets for the wireless earpieces 142, 144. As a result, proximity to the magnet 114 and reed switch 146 may engage the reed switch 146 to the open mode 150. As a result, the wireless earpiece 142 may be charged by the smart case. Removal of the wireless earpiece 142 disengages the
20 reed switch 146 resulting in the wireless earpiece 142 functioning under its own power.

In another embodiment, the magnet 114 may be integrated in the interface 108. For example, the interface 108 may include magnetic contacts that engage the reed switch 146. The reed switch 146 may be positioned anywhere on or within the wireless earpiece 142. Similarly, the magnet 114 may be positioned anywhere within the smart case 102 (or
25 integrated with any component) that allows the magnet 114 to interact with the reed switch 146 when the wireless earpiece 142 is seated within the receptacle 104. The case may have at least one button 119 or other manual input. The button may be touch sensitive, lighted, or mechanical. There also may be a light such as a LED in that location.

In another embodiment, each of the wireless earpieces 142, 144 may include a magnet so that the wireless earpieces 142, 144 may be positioned together to turn off the wireless earpieces 142, 144 when not in use. For example, the magnets and reed switches may be positioned to simultaneously deactivate the wireless earpieces 142, 144. The magnets may also serve another purpose in allowing the wireless earpieces 142, 144 to be stuck to metal objects (e.g., desk, refrigerator, decorations, etc.) when not in use to prevent the wireless earpieces 142, 144 from being dropped or lost.

Fig. 4 is a block diagram of a smart case 402 in accordance with an illustrative embodiment. FIG. 4 shows a wireless environment 400 in which wireless earpieces 401 communicate with and are stored within the smart case 402. The smart case 402 may have any number of configurations and include various circuitry, connections, and other components. The smart case 402 is one potential embodiment of the smart case 102 of FIGs. 1-3.

In one embodiment, the smart case 402 may include a battery 404, a logic engine 406, a memory 408, interfaces 410, 411, a transceiver 412, and a magnet 414. The battery 404 is a power storage device configured to charge the power storage system of the wireless earpieces 401 once or multiple times. In other embodiments, the battery 404 as well as the batteries of the wireless earpieces 401 may represent a fuel cell, thermal electric generator, piezo electric charger, solar charger, ultra-capacitor, or other existing or developing power storage technologies.

In another embodiment, the smart case 402 may include a touch interface or display. The touch interface may indicate the status of the smart case 402. For example, a light may indicate the battery status of the smart case 402 as well as connected wireless earpieces 401, download/synchronization status (e.g., synchronizing, complete, last synchronization, etc.), or other similar information.

The battery 404 may itself be charged through an interface 410. The interface 410 is a hardware interface for connecting the smart case to a power supply or other electronic device. The interfaces 410 may be utilized for charging as well as communications with

externally connected devices. For example, the interface 410 may represent a mini-USB, micro-USB or other similar miniature standard connector.

The interface 411 is hardware interface for connecting and communicating with the wireless earpieces 401. The interface 411 may include any number of pins, arms, or
5 connectors for electrically interfacing with the contacts or other interface components of the wireless earpieces 401. In one embodiment, the interface 411 is a magnetic interface that automatically couples to contacts or an interface of the wireless earpieces 401. In another embodiment, the interface 411 may include a wireless inductor for charging the wireless earpieces 401 without a physical connection.

10 The logic engine 406 is the logic that controls the operation and functionality of the smart case 402. The logic engine 406 may include circuitry, chips, and other digital logic. The logic engine 406 may also include programs, scripts, and instructions that may be implemented to operate the logic engine 406. The logic engine 406 may represent hardware, software, firmware, or any combination thereof. In one embodiment, the logic
15 engine 406 may include one or more processors, such as microprocessors. The logic engine 406 may also represent an application specific integrated circuit (ASIC) or field programmable gate array (FPGA).

For example, a processor included in the logic engine 406 is circuitry or logic enabled to control execution of a set of instructions. The processor may be one or more
20 microprocessors, digital signal processors, application-specific integrated circuits (ASIC), central processing units, or other devices suitable for controlling an electronic device including one or more hardware and software elements, executing software, instructions, programs, and applications, converting and processing signals and information, and performing other related tasks. The processor may also manage transmission and reception
25 of audio and data, GPS information, wireless LAN, GSM, or LTE, SIM or data cards, or so forth. The processor may be a single chip or integrated with other computing or communications elements of the smart case 402.

The memory 408 is a hardware element, device, or recording media configured to store data for subsequent retrieval or access at a later time. The memory 408 may be static

or dynamic memory. The memory 408 may include a hard disk, random access memory, quantum computing drive, cache, removable media drive, mass storage, or configuration suitable as storage for data, instructions, and information. In one embodiment, the memory 408 and the logic engine 406 may be integrated. The memory may use any type of volatile
5 or non-volatile storage techniques and mediums. The memory 408 may store information related to the status of the smart case 402 as well as the wireless earpieces 401.

The transceiver 412 is a component comprising both a transmitter and receiver which may be combined and share common circuitry on a single housing. The transceiver 412 may communicate utilizing Bluetooth, Wi-Fi, ZigBee, ANT+, near field
10 communications, wireless USB, infrared, mobile body area networks, ultra-wideband communications, cellular or other suitable radio frequency standards, networks, protocols, or communications. The transceiver 412 may also be a hybrid transceiver that supports a number of different communications. For example, the transceiver 412 may communicate with the wireless earpieces 401 utilizing NFC or various Bluetooth communications.

15 The components of the smart case 402 may be a multi-layer printed circuitry board (PCB) electrically connected utilizing any number of wires, contact points, leads, busses, wireless interfaces, or so forth. In addition, the smart case 402 may include any number of computing and communications components, devices or elements which may include busses, motherboards, circuits, ports, interfaces, cards, converters, adapters, connections,
20 transceivers, displays, antennas, and other similar components.

Although not specifically shown, the smart case 402 may communicate with any number of other networks or devices to log information. For example, the smart case 402 may access a portal to store information related to the data acquired by the wireless earpieces 401 and/or smart case 402. The portal may be a web site that functions as a
25 central point of access to information on the Internet or an intranet. The portal may be accessed from any computing or communications system or device enabled to communicate through a network connection. For example, information accessed by the portal may be stored on a server and an associated database. In another embodiment, the smart case 402 may include a port for receiving a data or communication card (e.g., SIM

card, micro SD card, etc.). The data or communications cards may be utilized to store information and may be utilized for data communications.

The wireless earpieces 401 may include components similar to those shown for the smart case 402 that are miniaturized and compacted to fit within the three dimensional footprint of the wireless earpieces 401. Although not shown, the wireless earpieces 401 may include circuitry for operating the device including a logic engine (e.g., microprocessor), memory, and transceiver all of which are powered by an onboard battery.

In one embodiment, the wireless earpieces 401 may each include a reed switch 416. The reed switch 416 may initiate a low power mode of the wireless earpieces 402 when activated (e.g., opened) by the magnet 414 of the smart case 402. As a result, the wireless earpieces 401 may move to a lower power mode when positioned within the smart case 402. Similarly, the reed switch 416 may initiate a self-power (or high power) mode when deactivated (e.g., closed) by the magnet 414 of the smart case 402. During the low power mode, the wireless earpieces 401 may synchronize data with the memory 408 of the smart case 402. In addition, the wireless earpieces may perform maintenance of a real-time clock and maintain other essential onboard software programs. The wireless earpieces 401 may also perform hardware and software verification upon moving to or from a high power mode to ensure proper operation of the wireless earpieces 401. In another embodiment, activation of the reed switch 416 by the magnet 414 may move the wireless earpieces 401 to their lowest power mode during which minimal required functions may be performed (e.g., software updates, data synchronization, clock updates, etc.). As a result, the wireless earpieces 416 may be fully activated and ready for use when positioned in a user's ears. The reed switch 416 allows precise initiation and deactivation of the onboard battery in order to maintain optimal levels of onboard power.

Fig. 5 is a flowchart of a process for utilizing a wireless earpieces with a smart case in accordance with an illustrative embodiment. In one embodiment, the processes of FIG. 5 may be implemented by one or more wireless earpieces interfacing or coupling with a smart case. The smart case may interact with the wireless earpieces individually or as a unit. In one example, the smart case may only interact with a master earpiece with

subsequent control signals and commands relayed by the master wireless earpiece to the slave or subservient wireless earpiece.

5 In one embodiment, the process may begin with the wireless earpiece determining whether a magnetic field is present (step 502). In one embodiment, the determination of step 502 may be made based on the interaction of a magnet (or magnetic field) with a reed switch of the wireless earpiece. In another embodiment, logic or a processor may also be utilized to determine if the magnetic field is present. The magnet may be a permanent magnet, electromagnet, temporary, or hybrid magnet.

10 If the magnetic field is not present, the wireless earpiece remains powered on as the reed switch remains closed (step 504). When the reed switch is closed the onboard battery of the wireless earpiece powers and operates the wireless earpiece to ensure full functionality. In one embodiment, if the wireless earpieces has gone from detecting the magnetic field to not detecting the magnetic field (e.g., wireless earpieces was removed from the smart case), a startup process for the wireless earpiece may be initiated. For
15 example, the battery may power the circuitry of the wireless earpiece executing a boot up program and preparing the wireless earpiece for operation.

Next, the wireless earpiece operates utilizing the onboard battery (step 506). During step 504, the wireless earpiece operates normally with the onboard battery powering the circuitry and components of the wireless earpiece. For example, the wireless
20 earpiece may communicate with another electronic device, such as a cell phone, laptop, gaming device, music player, or so forth, to make calls, play music or sounds, or otherwise interact. The wireless earpiece may continuously determine whether the magnetic field is present.

If the magnetic field is determined to be present in step 502, the reed switch is
25 opened by the magnetic field (step 508). The reed switch is opened automatically based on its nature and configuration when the magnetic field is present. In one embodiment, the wireless earpiece may move to a low power mode in order to preserve battery life when in the reed switch is activated potentially indicating that the wireless earpiece is within the smart case. The wireless earpiece may alternatively enter a reduced power mode, sleep, or

other mode. The wireless earpiece may also send a command or communication to the second wireless earpiece to change power mode or otherwise act in response to the reed switch being opened. In one embodiment, by moving the device to a low power mode, the wireless earpiece, the wireless earpiece is prepared to be charged. In another embodiment, the wireless earpieces may enter a low power mode in response to detecting proximity to the smart case before entering a low power mode based on activation of the reed switch by a magnet of the smart case.

Next, the wireless earpiece couples to the smart case (step 510). The coupling of the smart case and the wireless earpiece may be based on contact, proximity, or short-range wireless communications. The wireless earpiece may connect to or link with the smart case utilizing points of contact, male and female connectors, or so forth. For example, magnetic contacts may be utilized between the smart case and wireless earpiece to provide a physical interface. The wireless earpieces may utilize contacts to preserve the waterproof nature of the wireless earpieces. During step 510, communications between the wireless earpiece and smart case may also be initiated. For example, data from the wireless earpiece may be synchronized to the smart case.

In another embodiment, the wireless earpiece may be detected wirelessly. For example, the wireless earpiece may be detected by the smart case utilizing a NFC signal, radio frequency identification tag, or other short range communications signal. In one embodiment, the wireless earpiece may be required to be within a threshold distance (e.g., 10 feet, 10cm, etc.) to be detected by the smart case. Once the wireless earpiece is proximate the smart case, the smart case may begin to implement any number of actions for the wireless earpiece as well as the smart case. For example, the wireless earpiece may begin a move to a low power mode in anticipation of being coupled to the smart case or may enter a low power mode.

Next, the wireless earpiece charges the onboard battery based on power provided by the smart case (step 512). During step 512, the wireless earpiece may determine whether a charge is required for the wireless earpiece. For example, a charge threshold may be utilized by the battery. If a charge is not required, the wireless earpiece does not

receive power from the smart case. In one embodiment, the wireless earpiece may automatically charge the onboard battery in response to determining the battery status is anything less than 95%. The wireless earpiece may also charge the onboard battery in response to a designated time period elapsing, such as two days, to ensure the batteries are
5 fully functional and kept at full capacity. Maintenance of the batteries may be particularly important when being stored after manufacturing, during a sales period, or during extended periods of non-use. Although referred to as batteries, the batteries for each of the wireless earpieces may represent ultra-capacitors, fuel cells, heat pump power generators, or other power storage or generation devices.

10 In another embodiment, during step 510 or 512 the wireless earpiece may download or synchronize data with the smart case. The data may include biometric information (e.g., pulse rate, oxygenation, distance travelled, calories burned, etc.), exercise information, commands received, and other data logged by sensors (e.g., heart rate monitor, pulse oximeter, accelerometers, gyroscopes, etc.) of the wireless earpiece or otherwise
15 determined. The data may represent user data or data about the performance of the wireless earpieces. In one embodiment, only new data gathered by the wireless earpieces may be synchronized to the smart case. The data may also include medical information, such as blood measurements, voice data (e.g., jitter/shimmer rates), temperature, chemical levels (e.g., sodium, glucose, etc.), ambient environment information (e.g., temperature,
20 altitude, barometric readings, speed, etc.) captured audio or video, or so forth.

During any of steps 508-510, the wireless earpiece may enter a power saver or low power mode. During the power saver mode the wireless earpiece may utilize minimal power to maintain functionality and alert status of the wireless earpiece. For example, the wireless earpiece may be configured to communicate with one or more other external
25 devices, such as the smart case, another pair of wireless earpieces, mobile devices, personal computers, routers, or so forth. Location data of the user may be shared with other external devices and corresponding applications. In the power saver mode the wireless earpiece minimizes power utilization while still exerting full control over the power utilization, charging, and synchronization of the wireless earpieces. The low power mode maintains

the earpieces with minimal functionality to charge and synchronize data as well as other designated functions that may be set by user preferences, default, program updates from a central location, or so forth. As a result, the battery of the wireless earpieces may be maintained in an optimal state. In addition, the transition from the low power mode to a
5 high power mode may be implemented upon detecting the wireless earpieces have been removed from the smart case.

The illustrative embodiments are not to be limited to the particular embodiments described herein. In particular, the illustrative embodiments contemplate numerous variations in the type of ways in which embodiments may be applied. The foregoing
10 description has been presented for purposes of illustration and description. It is not intended to be an exhaustive list or limit any of the disclosure to the precise forms disclosed. It is contemplated that other alternatives or exemplary aspects are considered included in the disclosure. The description is merely examples of embodiments, processes or methods of the invention. It is understood that any other modifications, substitutions,
15 and/or additions may be made, which are within the intended spirit and scope of the disclosure. For the foregoing, it can be seen that the disclosure accomplishes at least all of the intended objectives.

The previous detailed description is of a small number of embodiments for implementing the invention and is not intended to be limiting in scope. The following
20 claims set forth a number of the embodiments of the invention disclosed with greater particularity.

What is claimed is:

1. A method for managing wireless earpieces, comprising:
powering circuitry of the wireless earpieces utilizing a high power mode in
5 response to detecting a magnetic field is not applied to one or more of the
wireless earpieces; and
altering the power sent to the circuitry of the wireless earpieces to a low power
mode in response to detecting a magnetic field is applied to one or more of the
wireless earpieces.
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2. The method of claim 1, further comprising:
operating the wireless earpieces utilizing an onboard battery in response to
detecting the magnetic field is not applied to one or more of the wireless
earpieces.
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3. The method of claim 1, further comprising:
charging an onboard battery of the wireless earpieces in response to detecting a
magnetic field is applied to the wireless earpieces.
- 20 4. The method of claim 1, wherein the magnetic field is applied by a magnet of a
smart case configured to receive the wireless earpieces.
5. The method of claim 1, wherein the magnetic field is detected by a reed switch of
the wireless earpieces.
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6. The method of claim 1, further comprising:
coupling the wireless earpieces to interfaces of a smart case, wherein the smart case
applies a magnetic field to one or more of the wireless earpieces.

7. The method of claim 1, wherein the magnetic field is detected by a reed switch integrated in magnetic contacts that interface with a smart case for securing the wireless earpieces.
- 5 8. The method of claim 1, further comprising:
synchronizing data between the wireless earpieces and a smart case in response to detecting the magnetic field.
9. The method of claim 1, wherein the low power mode is a power saver mode.
- 10 10. A wireless earpiece, comprising:
circuitry operating the wireless earpiece;
a battery powering the circuitry of the wireless earpiece; and
a reed switch connecting the battery to the circuitry, wherein the reed switch
15 connects the circuitry to the battery when a magnetic field is not detected, and
wherein the reed switch disconnects the circuitry from the battery when a
magnetic field is detected.
11. The wireless earpiece of claim 10, wherein the magnetic field is applied by a smart
20 case configured to receive the wireless earpiece, and wherein the smart case
powers the wireless earpiece when received in the smart case.
12. The wireless earpiece of claim 10, further comprising:
magnetic contacts in connection with the circuitry and the battery that interface
25 with a smart case to charge the battery.
13. The wireless earpiece of claim 12, wherein the wireless earpiece synchronizes data
with the smart case.

14. The wireless earpiece of claim 10, wherein the wireless earpiece alters a power level of the wireless earpiece in response to the reed switch detecting the magnetic field.
- 5 15. The wireless earpiece of claim 10, wherein the wireless earpiece updates software of the wireless earpiece in response to detecting the magnetic field.
16. The wireless earpiece of claim 10, wherein the circuitry includes logic that alters a power state of the wireless earpiece in response to detecting the magnetic field and a startup process in response to not detecting the magnetic field after having detected the magnetic field.
- 10
17. A system comprising the wireless earpiece of claim 10, wherein the wireless earpiece is a left earpiece and a smart case for charging the left earpiece, the smart case comprising:
- 15 a smart case housing;
a first receptacle for receiving the left earpiece disposed within the smart case housing;
a second receptacle for receiving a right earpiece disposed within the smart case housing;
a first interface associated with the first receptacle for electrically connecting the smart case to the left earpiece;
- 20 a second interface associated with the second receptacle for electrically connecting the smart case to the right earpiece;
an intelligent control disposed within the smart case housing and operatively connected to the first interface and the second interface.
- 25
18. The system of claim 17 wherein the smart case further comprises a display.
19. The system of claim 18 wherein the display is moveably connected to the smart case to transition from a first position to a second position.

20. The system of claim 19 wherein the smart case further comprises at least one manual input for receiving user input to provide additional functionality.

5

ABSTRACT OF THE DISCLOSURE

A system and method for managing wireless earpieces. Circuitry of the wireless earpieces are powered utilizing a high power mode in response to detecting a magnetic field is not applied to one or more of the wireless earpieces. The power sent to the
5 circuitry of the wireless earpieces is altered to a low power mode in response to detecting the magnetic field is applied to one or more of the wireless earpieces.

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

Application Data Sheet 37 CFR 1.76		Attorney Docket Number	BRAGI GmbH-P0017
		Application Number	
Title of Invention	Power Control for Battery Powered Personal Area Network Device System 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.)
--------------------------	---

Inventor Information:

Inventor	1				Remove	
Legal Name						
Prefix	Given Name	Middle Name	Family Name	Suffix		
	Eric	Christian	Hirsch			
Residence Information (Select One) US Residency ☒ Non US Residency Active US Military Service						
City	München	Country of Residence ⁱ		DE		
Mailing Address of Inventor:						
Address 1		Sendlinger St 7				
Address 2						
City	München	State/Province				
Postal Code	80331	Country ⁱ	DE			
Inventor	2				Remove	
Legal Name						
Prefix	Given Name	Middle Name	Family Name	Suffix		
	Peter	Vincent	Boesen			
Residence Information (Select One) US Residency ☒ Non US Residency Active US Military Service						
City	München	Country of Residence ⁱ		DE		
Mailing Address of Inventor:						
Address 1		Sendlinger St 7				
Address 2						
City	München	State/Province				
Postal Code	80331	Country ⁱ	DE			
All Inventors Must Be Listed - Additional Inventor Information blocks may be generated within this form by selecting the Add button.						
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Correspondence Information:

Application Data Sheet 37 CFR 1.76		Attorney Docket Number	BRAGI GmbH-P0017
		Application Number	
Title of Invention	Power Control for Battery Powered Personal Area Network Device System 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	133690		
Email Address	docketing@goodhue.com	Add Email	Remove Email

Application Information:

Title of the Invention	Power Control for Battery Powered Personal Area Network Device System and Method		
Attorney Docket Number	BRAGI GmbH-P0017	Small Entity Status Claimed	☒
Application Type	Nonprovisional		
Subject Matter	Utility		
Total Number of Drawing Sheets (if any)		Suggested Figure for Publication (if any)	

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	133690		

Application Data Sheet 37 CFR 1.76		Attorney Docket Number	BRAGI GmbH-P0017
		Application Number	
Title of Invention	Power Control for Battery Powered Personal Area Network Device System and Method		

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)
	Claims benefit of provisional	62211767	2015-08-29
Additional Domestic Benefit/National Stage Data may be generated within this form by selecting the Add button.			Add

Foreign Priority Information:

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)ⁱ 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 ⁱ	Filing Date (YYYY-MM-DD)	Access Code ^j (if applicable)	Remove
Additional Foreign Priority Data may be generated within this form by selecting the Add button.				Add

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	BRAGI GmbH-P0017
		Application Number	
Title of Invention	Power Control for Battery Powered Personal Area Network Device System 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	BRAGI GmbH-P0017
		Application Number	
Title of Invention	Power Control for Battery Powered Personal Area Network Device System 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	Remove
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	BRAGI GmbH	
Mailing Address Information For Applicant:		
Address 1	Sendlinger St 7	
Address 2		
City	München	State/Province
Country	DE	Postal Code
Phone Number		Fax Number
Email Address		
Additional Applicant Data may be generated within this form by selecting the Add button. Add		

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.

Application Data Sheet 37 CFR 1.76		Attorney Docket Number	BRAGI GmbH-P0017
		Application Number	
Title of Invention	Power Control for Battery Powered Personal Area Network Device System and Method		

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.				
				Remove
If the Assignee or Non-Applicant Assignee is an Organization check here.				☐
Prefix	Given Name	Middle Name	Family Name	Suffix
Mailing Address Information For Assignee including Non-Applicant Assignee:				
Address 1				
Address 2				
City		State/Province		
Country ⁱ		Postal Code		
Phone Number		Fax Number		
Email Address				
Additional Assignee or Non-Applicant Assignee Data may be generated within this form by selecting the Add button.				Add

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 D. GOODHUE/		Date (YYYY-MM-DD)	2016-08-23
First Name	John	Last Name	Goodhue	Registration Number
				47603
Additional Signature may be generated within this form by selecting the Add button.				Add

Application Data Sheet 37 CFR 1.76		Attorney Docket Number	BRAGI GmbH-P0017
		Application Number	
Title of Invention	Power Control for Battery Powered Personal Area Network Device System and Method		

This collection of information is required by 37 CFR 1.76. 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 23 minutes to complete, including gathering, preparing, and submitting the completed application data sheet 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.**

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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.

1/5

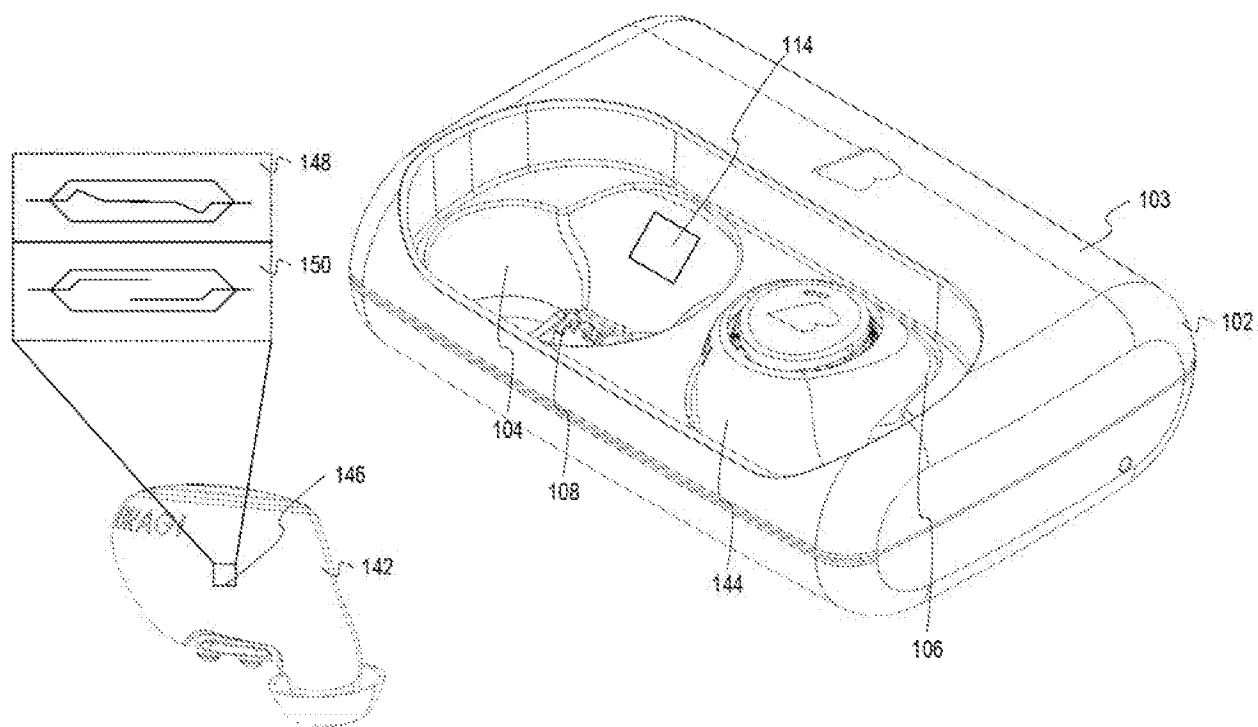


FIG. 1

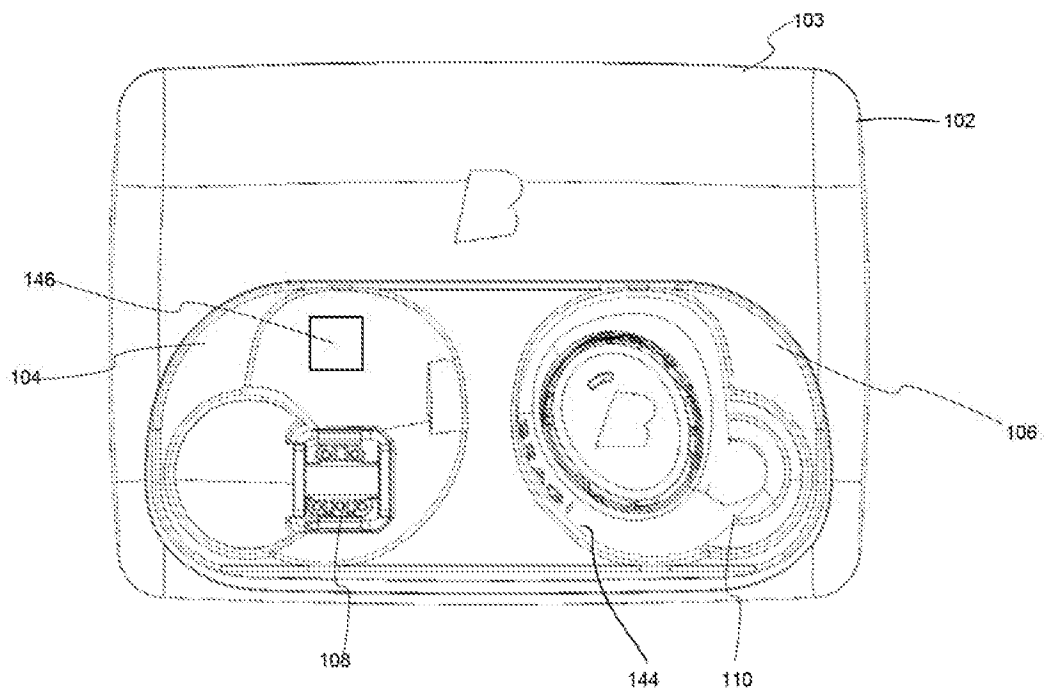


FIG. 2

3/5

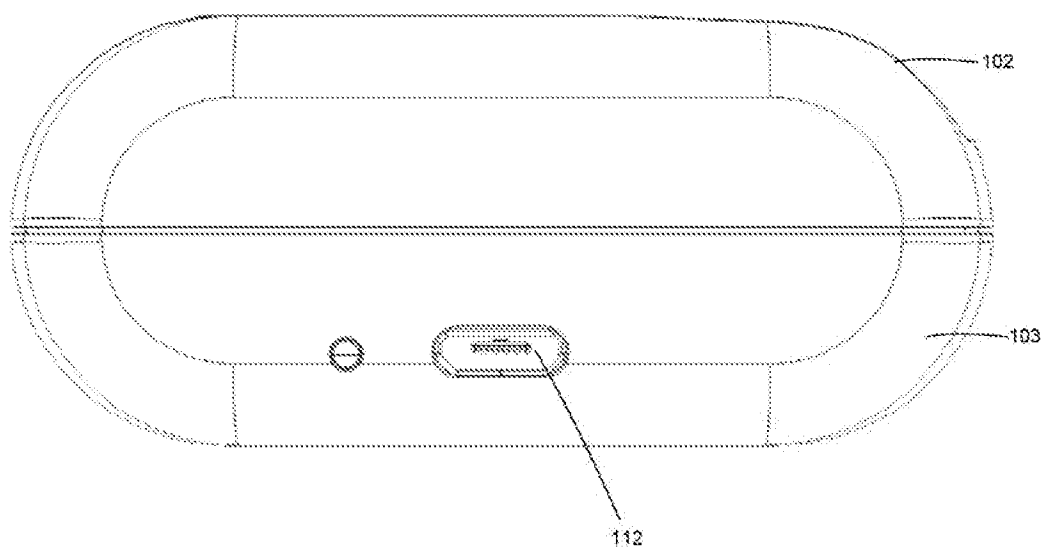


FIG. 3

4/5

400

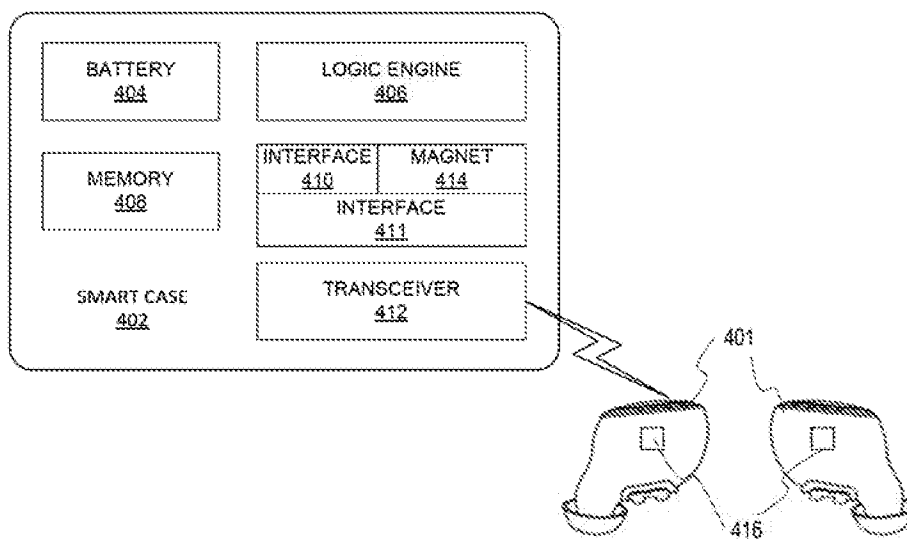
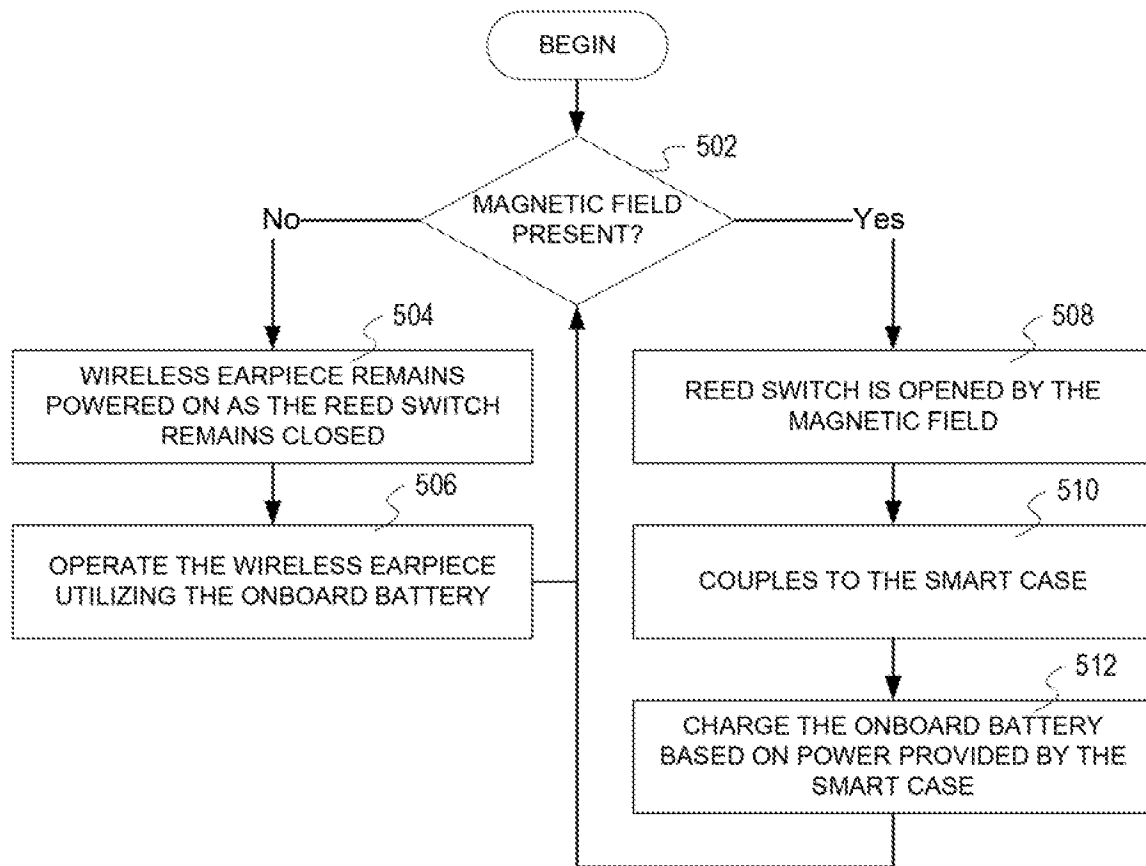


FIG. 4



Electronic Patent Application Fee Transmittal

Application Number:

Filing Date:

Title of Invention:

Power Control for Battery Powered Personal Area Network Device System and Method

First Named Inventor/Applicant Name:

Eric Christian Hirsch

Filer:

John Darrell Goodhue/Ashlyn Nguyen

Attorney Docket Number:

BRAGI GmbH-P0017

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	70	70
Utility Search Fee	2111	1	300	300
Utility Examination Fee	2311	1	360	360

Pages:

Claims:

Miscellaneous-Filing:

Late Filing Fee for Oath or Declaration	2051	1	70	70
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Petition: Page 35 of 270

Description	Fee Code	Quantity	Amount	Sub-Total in USD(\$)
Patent-Appeals-and-Interference:				
Post-Allowance-and-Post-Issuance:				
Extension-of-Time:				
Miscellaneous:				
Total in USD (\$)				800

Electronic Acknowledgement Receipt

EFS ID:	26727796
Application Number:	15245031
International Application Number:	
Confirmation Number:	1285
Title of Invention:	Power Control for Battery Powered Personal Area Network Device System and Method
First Named Inventor/Applicant Name:	Eric Christian Hirsch
Customer Number:	133690
Filer:	John Darrell Goodhue/Ashlyn Nguyen
Filer Authorized By:	John Darrell Goodhue
Attorney Docket Number:	BRAGI GmbH-P0017
Receipt Date:	23-AUG-2016
Filing Date:	
Time Stamp:	19:16:32
Application Type:	Utility under 35 USC 111(a)

Payment information:

Submitted with Payment	no
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File Listing:

Document Number	Document Description	File Name	File Size(Bytes)/ Message Digest	Multi Part /.zip	Pages (if appl.)
1		Bragi_ID_0017_SPEC.pdf	6124711	yes	21
			f5b9eca79affee9777f43d7deba86e401a1d32d6		

	Multipart Description/PDF files in .zip description				
	Document Description		Start	End	
	Specification		1	16	
	Claims		17	20	
	Abstract		21	21	
Warnings:					
Information:					
2	Application Data Sheet	BRAGIGmbH-P0017_ADS.pdf	1822868	no	8
			696bd7c6845373b066eba3ac2f12a4d4f532e568		
Warnings:					
Information:					
3	Drawings-only black and white line drawings	BRAGIGmbH-P0017_FIGS.pdf	346389	no	5
			05c8608f0f0276ec93ac64f69b68f29eda7744ed		
Warnings:					
Information:					
4	Fee Worksheet (SB06)	fee-info.pdf	37024	no	2
			deac1023dad549abf6d99deb822a4768db9e50ee		
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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.

INFORMATION DISCLOSURE STATEMENT BY APPLICANT (Not for submission under 37 CFR 1.99)	Application Number		15245031
	Filing Date		2016-08-23
	First Named Inventor	Eric Christian Hirsch	
	Art Unit		
	Examiner Name		
	Attorney Docket Number	BRAGI GmbH-P0017	

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	3934100	A	1976-01-20	Harada	Entire Document
	2	4150262	A	1979-04-17	Ono	Entire Document
	3	4334315	A	1982-06-08	Ono et al.	Entire Document
	4	4375016	A	1983-02-22	Harada	Entire Document
	5	4588867	A	1986-05-13	Konomi	Entire Document
	6	4654883	A	1987-03-31	Iwata	Entire Document
	7	4682180	A	1987-07-21	Gans	Entire Document
	8	4791673	A	1988-12-13	Schreiber	Entire Document

**INFORMATION DISCLOSURE
STATEMENT BY APPLICANT**
(Not for submission under 37 CFR 1.99)

Application Number		15245031
Filing Date		2016-08-23
First Named Inventor	Eric Christian Hirsch	
Art Unit		
Examiner Name		
Attorney Docket Number	BRAGI GmbH-P0017	

9	4865044	A	1989-09-12	Wallace et al.	Entire Document
10	5191602	A	1993-03-02	Regen et al.	Entire Document
11	5201007	A	1993-04-06	Ward et al.	Entire Document
12	5280524	A	1994-01-18	Norris	Entire Document
13	5295193	A	1994-03-15	Ono	Entire Document
14	5298692	A	1994-03-29	Ikeda et al.	Entire Document
15	5343532	A	1994-08-30	M. Wilbert Shugart	Entire Document
16	5363444	A	1994-11-08	Norris	Entire Document
17	5497339	A	1996-03-05	Bernard	Entire Document
18	5606621	A	1997-02-25	Reiter et al.	Entire Document
19	5613222	A	1997-03-18	Guenther	Entire Document

**INFORMATION DISCLOSURE
STATEMENT BY APPLICANT**
(Not for submission under 37 CFR 1.99)

Application Number		15245031
Filing Date		2016-08-23
First Named Inventor	Eric Christian Hirsch	
Art Unit		
Examiner Name		
Attorney Docket Number	BRAGI GmbH-P0017	

20	5692059	A	1997-11-25	Kruger	Entire Document
21	5721783	A	1998-02-24	Anderson	Entire Document
22	5749072	A	1998-05-05	Mazurkiewicz et al.	Entire Document
23	5771438	A	1998-06-23	Palermo et al.	Entire Document
24	5802167	A	1998-09-01	Hong	Entire Document
25	5929774	A	1999-07-27	Charlton	Entire Document
26	5933506	A	1999-08-03	Aoki et al.	Entire Document
27	5949896	A	1999-09-07	Nageno et al.	Entire Document
28	5987146	A	1999-11-16	Pluvinae et al.	Entire Document
29	6339754	B1	2002-01-15	Flanagan et al.	Entire Document
30	6021207	A	2000-02-01	Puthuff et al.	Entire Document

**INFORMATION DISCLOSURE
STATEMENT BY APPLICANT**
(Not for submission under 37 CFR 1.99)

Application Number		15245031
Filing Date		2016-08-23
First Named Inventor	Eric Christian Hirsch	
Art Unit		
Examiner Name		
Attorney Docket Number	BRAGI GmbH-P0017	

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Application Number		15245031
Filing Date		2016-08-23
First Named Inventor	Eric Christian Hirsch	
Art Unit		
Examiner Name		
Attorney Docket Number	BRAGI GmbH-P0017	

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	2	BRAGI Is On Facebook (2014)	
	3	BRAGI UPDATE - Arrival Of Prototype Chassis Parts - More People - Awesomeness (5/13/2014)	
	4	BRAGI UPDATE - Chinese New Year, Design Verification, Charging Case, More People, Timeline(3/6/2015)	
	5	BRAGI UPDATE - First Sleeves From Prototype Tool - Software Development Kit (6/5/2014)	
	6	BRAGI UPDATE - Let's Get Ready To Rumble, A Lot To Be Done Over Christmas (12/22/2014)	

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7	BRAGI UPDATE - Memories From April - Update On Progress (9/16/2014)
8	BRAGI UPDATE - Memories from May - Update On Progress - Sweet (10/13/2014)
9	BRAGI UPDATE - Memories From One Month Before Kickstarter - Update On Progress (7/10/2014)
10	BRAGI UPDATE - Memories From The First Month of Kickstarter - Update on Progress (8/1/2014)
11	BRAGI UPDATE - Memories From The Second Month of Kickstarter - Update On Progress (8/22/2014)
12	BRAGI UPDATE - New People @BRAGI- Prototypes (6/26/2014)
13	BRAGI UPDATE - Office Tour, Tour To China, Tour to CES (12/11/2014)
14	BRAGI UPDATE - Status On Wireless, Bits and Pieces, Testing-Oh Yeah, Timeline(4/24/2015)
15	BRAGI UPDATE - The App Preview, The Charger, The SDK, BRAGI Funding and Chinese New Year (02/11/2015)
16	BRAGI UPDATE - What We Did Over Christmas, Las Vegas & CES (01/19/2014)
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18	BRAGI UPDATE-Alpha 5 and Back To China, Backer Day, On Track(5/16/2015)	
19	BRAGI UPDATE-Beta2 Production and Factory Line(8/20/2015)	
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22	BRAGI UPDATE-Developer Units Started Shipping and Status (10/19/2015)	
23	BRAGI UPDATE-Developer Units, Investment, Story and Status(11/2/2015)	
24	BRAGI UPDATE-Getting Close(8/6/2014)	
25	BRAGI UPDATE-On Track, Design Verification, How It Works and What's Next(7/15/2015)	
26	BRAGI UPDATE-On Track, On Track and Gems Overview (6/24/2015)	
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Attorney Docket Number	BRAGI GmbH-P0017

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34	The Dash + The Charging Case & The BRAGI News (2/21/14)
35	The Dash-A Word From Our Software, Mechanical and Acoustics Team + An Update (3/11/2014)
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International Application Number:	
Confirmation Number:	1285
Title of Invention:	Power Control for Battery Powered Personal Area Network Device System and Method
First Named Inventor/Applicant Name:	Eric Christian Hirsch
Customer Number:	133690
Filer:	John Darrell Goodhue/Ashlyn Nguyen
Filer Authorized By:	John Darrell Goodhue
Attorney Docket Number:	BRAGI GmbH-P0017
Receipt Date:	30-AUG-2016
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Application Type:	Utility under 35 USC 111(a)

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Powered headset accessory devices

WO 2014043179 A2

ABSTRACT

A device for coupling to a connector on an ear cup of a headset includes a mating connector corresponding to the connector of the headset. The mating connector includes a crossover conductor coupled to a first and a second terminal within the mating connector. One or more accessory circuits is provided by the device, including a lamp configured to direct light onto a surface external to the device or a position detection circuit usable to adjust three-dimensional audio signals to account for the direction the user is looking.

DESCRIPTION

POWERED HEADSET ACCESSORY DEVICES

BACKGROUND

[0001] This disclosure relates to providing powered accessory devices for headsets.

[0002] U.S. Patent Publication 2010/0260361, fully incorporated herein by reference, describes a headset with a modular connection allowing a down-cable, optionally supporting a boom microphone, to be connected to either ear cup, with a crossover plug connected to the opposite ear cup to connect an audio signal provided by the down-cable to the acoustic driver in the ear cup to which the plug is connected. Figures 1 A and 1 B are derived from figures 1 and 4 of that publication. As shown in figure 1 A, the system incorporates a headset assembly 10, a down-cable assembly 20 and a crossover plug 30. The headset assembly 10 incorporates a first ear cup 12a having an acoustic driver 14a and a connector 16a (both seen more clearly in figure 1 B), a second ear cup 12b having an acoustic driver 14b and a connector 16b, and a headband 18 that couples together the ear cups 12a and 12b. The down-cable assembly 20 incorporates an electrically conductive cable 22, an upper coupling 24 to couple one end of the conductive cable 22 to either of the connectors 16a and 16b, a communications microphone 26a, a microphone boom 26b coupling the microphone 26a to the upper coupling 24, and a lower coupling 28 for connecting the other end of the conductive cable 22 to another device (not shown) such as an aircraft communications panel, a mobile phone, or a portable radio. The plug 30 is able to be coupled to either of the connectors 16a and 16b.

[0003] As shown in figure 1 B, multiple electrical conductors (e.g., electrical cabling or other form of electrical conductors) are carried by the headband 18 to convey electrical signals between the earpieces 12a and 12b. Power and ground conductors 40 and 42 are connected to corresponding conductors 50 and 52 in the upper coupling 24 of the down-cable 20 via terminals 60a and 62a in the connector 16a. The power and ground conductors 40 and 42 are also connected to power and ground terminals 60b and 62b in the second ear cup 12b so that the down-cable 20 can be connected to that ear cup instead and still provide power

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Applicant	Bose Corporation
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CLAIMS (1)

1. WHAT IS CLAIMED IS:

1. A device (102) for coupling to a connector (16a, 16b) on an ear cup (12a, 12b) of a headset (10), the device comprising:
 - a mating connector (101) corresponding to the connector of the headset, the mating connector including a crossover conductor (46) coupled to a first and a second terminal within the mating connector;
 - a power conductor and a ground conductor coupled to respective third and fourth terminals in the mating connector; and
 - an accessory electronic device (100, 102) powered by power received from the headset over the third and fourth terminal within the mating connector.
2. The device of claim 1, wherein the accessory electronic device comprises a lamp (122) configured to direct light onto a surface external to the device.
3. The device of claim 1, further comprising:
 - a battery compartment having positive and negative terminals for coupling to a battery, and
 - a power conductor and a ground conductor coupling power and ground terminals of the accessory device to the positive

to the headset. The power and ground conductors 40 and 42 provide power to first power electronics 64a in the first ear cup 12a and second power electronics 64b in the second ear cup 12b. A crossover conductor 44 is connected to crossover terminals 66a and 66b in

corresponding ear cup connectors 16a and 16b, but is not electrically coupled to anything else within either ear cup. The connectors 16a and 16b have left and right audio signal terminals 68a and 68b, respectively, coupled to the acoustic transducers 14a and 14b.

[0004] In the example of figure 1 B, a crossover conductor 46 in the crossover plug 30 connects the crossover terminal 66b to the right audio signal terminal 68b in connector 16b. In the upper coupling 24 of the down-cable 20, a left audio conductor 54 is coupled to the left audio signal terminal 68a in the connector 16a, while a right audio conductor 56 is connected to the crossover terminal 66a, from which the crossover conductor 44 conducts the right audio signal to the crossover terminal 66b in the connector 16b. In this way, the crossover conductor 46 couples the right audio from the crossover terminal 66b to the right audio terminal 68b. If the down-cable 20 and crossover plug 30 were reversed, the right audio conductor 56 would be connected directly to the right audio terminal 68b to deliver audio signals to the right transducer 14b (via the power electronics 64b), while the crossover conductors 44 and 46 would couple the left audio signals from the left audio conductor 54 to the left audio terminal 68a through the crossover terminals 66a and 66b. This allows the down-cable 20 to be connected to either ear cup, without having to provide both left and right signals across the headband, and without any need to detect which side the down cable is connected to.

[0005] The design described in publication 2010/0260361 is implemented commercially in the A20[®] Aviation Headset from Bose[®] Corporation of Framingham, Massachusetts.

SUMMARY

[0006] In general, in one aspect, a device for coupling to a connector on an ear cup of a headset includes a mating connector corresponding to the connector of the headset, the mating connector including a crossover conductor coupled to a first and a second terminal within the mating connector, and a lamp configured to direct light onto a surface external to the device.

[0007] Implementations may include one or more of the following. A power conductor and a ground conductor may couple power and ground terminals of the lamp to third and fourth terminals in the mating connector. A battery compartment may have positive and negative terminals for coupling to a battery, and a power conductor and a ground conductor coupling power and ground terminals of the lamp to the positive and negative battery terminals. A second power conductor and a second ground conductor may couple the positive and negative battery terminals of the lamp to third and fourth terminals in the mating connector. A body may house the mating connector, with a boom extending from the body including a first aperture through which light from the lamp may exit the boom and a cover, rotatable around the boom and having a second aperture, blocks the first aperture when the cover is in a first rotation position and aligns the second aperture with the first aperture when the cover is in a second rotation position, and a switch is electrically coupled to the lamp and mechanically coupled to the cover, such that rotating the cover between the first and second rotation positions activates the switch to turn the lamp on when the cover is in the second rotation position and off when the cover is in the first rotation position.

[0008] In general, in one aspect, a device for coupling to a connector on an ear cup of a headset includes a mating connector corresponding to the connector of

and negative battery terminals

4. The device of claim 1, further comprising:

a body housing the mating connector;

a boom extending from the body, the boom comprising:

a first aperture through which light from the lamp may exit the

boom;

a cover, rotatable around the boom and having a second aperture, such that the cover blocks the first aperture when the cover is in a first rotation position and aligns the second aperture with the first aperture when the cover is in a second rotation position; and a switch, electrically coupled to the lamp and mechanically coupled to the cover, such that rotating the cover between the first and second rotation positions activates the switch to turn the lamp on when the cover is in the second rotation position and off when the cover is in the first rotation position.

The device of claim 1, wherein the accessory electronic device

comprises:

a position sensor (202) for determining a position of the device; and a data connection (206) outputting data from the position sensor.

The device of claim 5, further comprising:

a second position sensor for determining a position of the device on a second axis, orthogonal to a first axis on which the first position sensor determines position.

The device of claim 6, wherein the first and second position sensors comprise gyroscopes responsive to rotation around the respective first and second axes.

The device of claim 6, wherein the first and second position sensors comprise accelerometers responsive to displacement along the respective first and second axes.

The device of claim 6, wherein the first and second position sensors comprise magnetometers responsive to changes in magnetic fields associated with movement of the device around the respective first and second axes.

A system for providing directional audible information to a user, the system comprising:

a headset (10) having a first ear cup (12a) having a first connector

(16a) and a second ear cup (12b) having a second connector (16b), both of the first and the second connectors being operable for connection to an aircraft radio;

an acoustic imaging system operable to receive a sound signal and first data identifying a first directional location;

the headset, the mating connector including a crossover conductor coupled to a first and a second terminal within the mating connector, a position sensor for determining a position of the device, and a data connection outputting data from the position sensor.

[0009] Implementations may include one or more of the following. A second position sensor may determine a position of the device on a second axis, orthogonal to a first axis on which the first position sensor determines position. The first and second position sensors may include gyroscopes responsive to rotation around the respective first and second axes. The first and second position sensors may include accelerometers responsive to displacement along the respective first and second axes. The first and second position sensors may include magnetometers responsive to changes in magnetic fields associated with movement of the device around the respective first and second axes.

[0010] In general, in one aspect, a system for providing directional audible information to a user includes a headset having a first ear cup having a first connector and a second ear cup having a second connector, both of the first and the second connectors being operable for connection to an aircraft radio. An acoustic imaging system is operable to receive a sound signal and first data identifying a first directional location, relative to a first external reference, associated with the sound, receive second data identifying a direction the user may be looking relative to a second external reference, generate binaural audio signals that represent the sound at a second directional location when perceived by the user, the second directional location corresponding to the first directional location and adjusted according to the direction the user may be looking, such that the user perceives the direction of the source of the sound to be at the first directional location relative to the first external reference, and output the binaural audio signals. An accessory device for coupling to either of the first or the second connector of the headset includes a mating connector corresponding to the connectors of the headset, the mating connector including a crossover conductor coupled to a first and a second terminal within the mating connector, a position sensor for determining a position of the accessory device, and a data connection outputting data from the position sensor to the acoustic imaging system. The data from the position sensor includes the second data representative of the direction the user may be looking relative to the external reference.

[0011] Implementations may include one or more of the following. The acoustic imaging system may be coupled to the aircraft radio, and the system may be configured to mix the binaural audio signals output by the acoustic imaging system with communications audio signals from the radio and deliver the mixed signals to the headset. The binaural audio signals output by the acoustic imaging system may be provided to the headset independently of signals from the aircraft radio. The accessory device may include a second data connection receiving the binaural audio signals from the acoustic imaging system and an audio output for providing the binaural audio signals to the headset through the mating connector. The accessory device may include a wireless transmitter for communication with the acoustic imaging system, and the acoustic imaging system may include a wireless receiver for communication with the accessory device. The first and second data may include two-dimensional location data. The two-dimensional location data may a horizontal angle away from a vertical origin of the first or second external reference, and a vertical angle away from a horizontal angle of the first or second external reference. The first external reference may be the Earth, the vertical origin of the first external reference may be a line parallel to gravity and ahead of the direction an aircraft may be traveling, and the horizontal origin of the first external reference may be the horizon. The second external reference may be an aircraft in which the user is located, the vertical origin of the second external reference may be a line directly in front of the aircraft and vertical

relative to a first external reference, associated with the sound,

receive second data identifying a direction the user is looking

relative to a second external reference,

generate binaural audio signals that represent the sound at a

second directional location when perceived by the user, the second directional location corresponding to the first directional location and adjusted according to the direction the user is looking, such that the user perceives the direction of the source of the sound to be at the first directional location relative to the first external reference, and

output the binaural audio signals; and

an accessory device for coupling to either of the first or the second connector of the headset, the accessory device comprising:

a mating connector corresponding to the connectors of the headset, the mating connector including a crossover conductor coupled to a first and a second terminal within the mating connector;

a position sensor for determining a position of the accessory device; and

a data connection outputting data from the position sensor to the acoustic imaging system;

wherein the data from the position sensor comprises the second data representative of the direction the user is looking relative to the external reference. The system of claim 10, wherein the acoustic imaging system is

coupled to the aircraft radio, and the system is configured to mix the binaural audio signals output by the acoustic imaging system with communications audio signals from the radio and deliver the mixed signals to the headset.

12. The system of claim 10, wherein the binaural audio signals output by the acoustic imaging system are provided to the headset independently of signals from the aircraft radio.

13. The system of claim 12, wherein the accessory device further

comprises:

a second data connection receiving the binaural audio signals from the acoustic imaging system; and

an audio output for providing the binaural audio signals to the headset through the mating connector

14. The system of claim 10, wherein:

the accessory device further comprises a wireless

when the aircraft is level, and the horizontal origin of the second external reference may be in a plane intersecting the user's ears and perpendicular to gravity when the aircraft is level.

[0012] In general, in one aspect, a device for coupling to a connector on an ear cup of a headset includes a mating connector corresponding to the connector of the headset, the mating connector including a crossover conductor coupled to a first and a second terminal within the mating connector, and a wireless transceiver coupled to a third and a fourth terminal within the mating conductor.

[0013] In general, in one aspect, a device for coupling to a connector on an ear cup of a headset includes a mating connector corresponding to the connector of the headset, the mating connector including a crossover conductor coupled to a first and a second terminal within the mating connector, and a portable power supply coupled to a third and a fourth terminal within the mating conductor.

[0014] Advantages include the ability to provide modular accessories to a headset without requiring cumbersome attachment mechanisms. Power may be provided from the headset to the accessory, from the accessory to the headset, or shared between them.

[0015] Other features and advantages will be apparent from the description and the claims.

BRIEF DESCRIPTION OF THE DRAWINGS

[0016] Figure 1 A shows a headset with a cable and terminator that can be attached to either ear cup.

[0017] Figure 1 B shows a schematic diagram of example wiring for the headset of figure 1 A.

[0018] Figures 2, 4, 5, 6, 7, 8, 9, 10, and 11 show schematic diagrams of modular accessories and their connection to a headset like that of figure 1 A.

[0019] Figures 3A, 3B, and 3C show an example of a modular accessory for use with a headset like that of figure 1 A.

DESCRIPTION

[0020] Additional capabilities may be added to a headset through the use of modular accessories that connect in place of the crossover plug described above. In figure 1 B, note that power and ground conductors 40 and 42 are connected to corresponding terminals 60a, 60b, 62a, and 62b in each ear cup, but are not used by the crossover plug 30. As shown in figure 2, a modular accessory 100 with an appropriate mating connector 101 housing the crossover cable 46 and connected in place of the crossover plug 30 may use the power available from the power and ground terminals 60b and 62b (or terminals 60a and 62a if connected to the first ear cup) for its own operation. Alternatively, the modular accessory 100 may provide power to the headset via those same conductors, in place of, or to supplement, the power provided by the down-cable 20. Several such accessories are described below. In other examples, the power available from the headset is insufficient to power the accessory, which supplies its own power, but is used to confirm for the accessory that the headset is in use. In still other examples, the power from the headset isn't needed by the accessory at all, but the connector 16a or 16b provides a useful attachment point for the accessory.

[0021] One type of accessory for this application is a reading lamp 102, as shown in figures 3A, 3B, 3C, and 4. For aviation headsets, such as the headset 104, pilots or passengers may need to view flight documents, e.g., a chart 106, and instrumentation, e.g., a control panel 108, in dark cockpits. Providing a small lamp 102 connected directly to the headset 10 keeps the light focused on whatever the user is looking at. Using the attachment point provided by the connector 16a or 16b (fig. 1 B) provides a more elegant and simple solution than other means of attaching a lamp to the headset, such as zip ties, glue, or hook-and-loop fasteners. It also leaves the user with one fewer piece of equipment to keep track of. A LED light source 110 will generally be sufficient, while having a low enough power requirement to either be powered by the headset power or by a small on-board battery 112. In particular, a red LED will help retain the user's dark-adapted vision and may be compatible with military night vision goggle systems.

[0022] A switch 114 is included which allows the user to turn the lamp on and off as needed. In some examples, the light

transmitter for

communication with the acoustic imaging system; and

the acoustic imaging system further comprises a wireless receiver for communication with the accessory device.

15. The system of claim 10, wherein the first and second data comprise two-dimensional location data.

16. The system of claim 15, wherein the two-dimensional location data comprise a horizontal angle away from a vertical origin of the first or second external reference, and a vertical angle away from a horizontal angle of the first or second external reference.

17. The system of claim 16, where the first external reference comprises the Earth, the vertical origin of the first external reference comprises a line parallel to gravity and ahead of the direction an aircraft is traveling, and the horizontal origin of the first external reference is the horizon.

18. The system of claim 16, where the second external reference is an aircraft in which the user is located, the vertical origin of the second external reference is a line directly in front of the aircraft and vertical when the aircraft is level, and the horizontal origin of the second external reference is in a plane intersecting the user's ears and perpendicular to gravity when the aircraft is level.

source 110 is located at the end of a short boom 116, and the switch 114 is connected to a rotatable section 118 at the end of the boom. Turning the rotatable section 118 (arrow 120 in figure 3B) turns the lamp 102 on and off. In some examples, the light source 110 may be part of the rotatable section 118 and rotate with it, or it may be located within the rotatable section and exposed or concealed by an aperture such as a window 122 in the rotatable section 118. The act of rotating the section 118 then serves to expose or conceal the light source 110, along with activating the switch 114 to turn it on when exposed and off when concealed. This provides a more intuitive interface to the user than a traditional push-button or toggle switch, in which the operation of the switch has no natural relationship to the state of the lamp.

[0023] Another type of accessory that may be coupled to the headset 10 through the connector 16a or 16b is a head-tracking sensor module. As shown in figure 5, a head tracking sensor module 200 includes sensors 202, such as gyroscopes, accelerometers, or magnetic field sensors, that measure the one-, two-, or three-dimensional angle of the headset, from which the direction the user is looking may be inferred. In a one-dimensional example, the rotation of the user's head in a horizontal plane is measured, i.e., how far left or right the user is looking. A second dimension would typically be elevation from the horizontal plane, i.e., how far up or down from the horizon the user is looking. In some examples, a third dimension, the side-to-side tilt of the user's head could also be measured. The sensor data is provided to an external processing system 204 through a data connection, such as a wireless link 206.

[0024] This information can then be used by two- or three-dimensional acoustic imaging systems to modify the sounds sent to the headset 10 so that the intended two- or three-dimensional position of a sound, relative to the vehicle, is adjusted to compensate for the actual direction the user is facing. For example, if an audible warning indicating the presence of another aircraft is meant to be positioned at 45 degrees to the right, relative to the aircraft's heading (the direction the aircraft is pointing), but the pilot is already looking 30 degrees to the right, then the sound should be delivered to the headset so that the pilot perceives it to be 15 degrees farther to the right of where he is facing. Vertical information, if present in the audio system and measured by the sensor module 200, can be similarly compensated. In some examples, vertical distance is provided as the relative elevation distance between the two aircraft. This may be combined with the lateral distance between them (absolute or projected into a horizontal plane, such as the ground) to compute the angle up or down at which the other aircraft can be observed.

[0025] In the example of figure 5, the external processing system 204 is connected to the aircraft's warning system 208 and radio 210. The processing system 204 receives the audio signals and intended position data from the warning system 208 and the actual head position information from the sensor module 200 (plus any available information about the aircraft's heading, such as from a GPS system 212), and modifies the audio signals based on the transfer function of the headset 10 so that the sounds will be heard from the correct location. It then provides the modified audio signals to the radio 210 for delivery to the headset.

[0026] Alternatively, the headset 10 may be directly connected to the external processing system 204 through its down-cable 20, such that the audio from the radio 210 is mixed with the modified directional audio signals within the external processing system 204 and delivered to the headset 10 by the processing system 204. In this embodiment, the wireless link 206 may be omitted, as the data from the sensors 202 can be delivered to the processing system 204 via the down-cable 20, for example by modulating it onto the power line 40 in the headset.

[0027] In some examples, directional information for warning sounds is delivered to an aircraft based on the direction the aircraft is moving (its "ground track"), which may not match the aircraft's actual heading (i.e., due to crosswinds adding a sideways component to the aircraft's movement), let alone the direction the pilot is facing within the aircraft. In such a situation, the audio system may compensate for both the aircraft's real heading relative to its ground track as well as the pilot's head position relative to the aircraft heading.

[0028] Similar systems may be used on ground vehicles, such as to warn a driver about nearby vehicles or to inform a gunner of the direction of a target, and on ships for similar purposes, when the available directional information is based on the heading of the vehicle or weapons platform, but the user may be looking another direction. A further example is use by a dismounted soldier, who may have a sniper-detection or other combat information system located in a backpack or otherwise on his body that produces audible indications of the direction of threats or squad mates. Adjusting audio warnings based on the direction the soldier is looking relative to the position of the detection system allows him to immediately know which direction the threat is located in. Similarly, if the relative position of other soldiers communicating over a radio is known, their voices can be delivered to the soldier's headset in the correct spatial position, helping maintain situational awareness. In a civilian context, such a system may be used to help a crane operator keep track audibly of the direction of a spotter communicating from the ground, to name one example.

[0029] As with the lighting example, using the connector on the headset minimizes the amount of equipment the user must have attached to his head or helmet, while allowing the headset itself to remain relatively simple, that is, the sensors and

related circuitry do not need to be integrated into the headset. If power available to the headset, such as from a vehicle intercom to which it is attached, is sufficient to power the sensor system, then the power and ground lines 40 and 42 may be used. If that power is not sufficient, or not always available, as in the case of a dismounted soldier using a portable radio, then an on-board battery 214 within the sensor module 200 may provide the required power.

[0030] Additional accessories that may make use of a connection socket on a headset are shown in figures 6 through 11. In these figures, we refer to the ear cup 12, connector 16, and components including driver 14, ANR circuit 64, audio conductor 119, and terminals 60, 62, 66, and 68 generically, without specifying the right or left ear cup. Some figures also show additional signal terminals between the headset and the accessory - while minimizing changes to the headset provides the advantages discussed above, additional accessory features may be enabled by increasing the connectivity between the accessory and the headset, such as providing a data channel between processors located in each. In some examples, the audio and other signals between the headsets may be digitized and multiplexed, allowing the number of wires in the headband to be kept low.

[0031] In figure 6, an accessory 300 includes a battery circuit 302 coupled to the power and ground terminals, and optionally a power switch 304 to control whether power is provided or a power supply circuit 306 to control the flow of voltage and current between the battery and the headset. Such a battery circuit may be combined with any of the other accessories discussed here, or may be the entire purpose of the accessory device. Additional features may include a charge indicator light 308, and external charging contacts or plug 310 for recharging the battery. An accessory with such a battery circuit may be used with a variety of other accessories by plugging the accessory with the battery circuit 302 into one ear cup and the other accessory into the other. The battery accessory may also be used on its own to power the ANR circuits of a headset that doesn't otherwise need to be plugged in. In some examples, two accessories with batteries may be used, one attached to each ear cup, to further extend the time in which the headset can be operated. When the headset is plugged into a power supply through the down cable, the power supply circuit 306 may use that power to recharge the battery circuit 302.

[0032] In figure 7, a biometric monitoring accessory 350 includes biometric or environmental sensors 352 that measure, for example, blood or

atmospheric oxygen levels and heart rate of the user. When a processor 354 determines that the sensor data indicates a problem, such as hypoxia or CO poisoning, it injects a warning signal into the crossover conductor 48, causing the warning to be output by the acoustic driver 14 of the ear cup 12 the monitoring accessory 350 is coupled to. Atmospheric sensors may also be used to derive air pressure in the environment of the headset (i.e., in a cockpit), and adjust performance of the headset, such as by compensating noise cancellation filters based on the speed of sound in the actual cockpit pressure environment. The accessory 350 may make such adjustments itself, if it has appropriate connections to the headset electronics, or it may simply communicate the available data to another controller.

[0033] In some applications, a number of headsets are connected to an aircraft intercom, so that the passengers can communicate with the pilot. In figure 8, a wireless communication accessory 400 includes a short-range two-way radio 402 that allows the passengers' headsets to communicate with each other and the pilot over a local wireless network, avoiding the need to plug into or even provide wired connections to the aircraft intercom at passenger seating positions. In some examples, the radio circuit 402 provides audio output at terminals 66 and 68, one for the near-side ear cup and one for the cross-over cable for the far side ear cup; in this example, the usual crossover plug 30 would be attached to the opposite ear cup. In other examples, additional connections may be provided in the connectors, so that the accessory can provide audio to both ear cups when the normal down-cable assembly 20 is used.

[0034] In some examples, the accessory 400 includes a built-in or boom microphone 404. A push-to-talk button 406 allows the user to indicate when they wish to speak to other passengers. In other examples, no microphone is provided, and the user can only listen to conversations on the intercom. The no-microphone version may also be used by the pilot, since the pilot headset already has the boom microphone from the down-cable assembly 20, but in that case an additional cable and terminals are needed in the headset to bring the microphone signal across the headband from the down-cable assembly 20 to the wireless accessory 400 for transmission to other wireless headsets. In some examples, the push-to-talk button is provided even when the boom microphone is not, as it may be used with the boom microphone in the down-cable assembly 20 (not shown). Some intercom systems include a receiver for such a switch, and providing the switch in a module that connects integrally to the headset avoids the need to attach a stand-alone switch to the user's clothing or other equipment. In other examples, the pilot may use the version with a microphone to communicate over the aircraft radio, if it is equipped with a compatible transceiver, in place of the wired down-cable assembly 20. This eliminates the need for the pilot to be tethered to the control panel, though that may not be permitted in some situations.

[0035] In some examples, the radio 402 can also communicate with accessories such as mobile phones or portable music players, allowing the passengers to use their aircraft headsets to make phone calls or listen to entertainment audio. The

radio 402 may be a general-purpose radio transceiver circuit such as a Bluetooth® or WiFi® transceiver, or it may be a custom circuit. The radio 402 may alternatively or additionally receive broadcast radio signals, such as commercial broadcasts or localized broadcasts, such as may be provided at a car race.

[0036] In the example of figure 9, an accessory 450 includes a temperature control system 452 which operates to heat or cool the headset by pumping an appropriate fluid through a tube 454 to modified ear cushions 456. This may be useful in applications where the user's head is exposed to undesirable temperature environments, such as where the headset prevents the user from wearing a hat in a cold environment, or where the headset itself is the source of discomfort in a hot environment.

[0037] In the example of figure 10, an accessory 500 includes a microphone array 502 and array signal processor 504. Such a microphone array provides a talk-through feature, allowing the user to hear the sounds in their environment that would otherwise be blocked by the headset. While the array is shown with two microphones, more may be used in some applications. If paired with a similar microphone array in the other ear cup, or even the boom microphone, the talk-through feature may provide directional awareness to the user.

[0038] In some examples, two of the down-cable assembly 20 are used, one for each ear cup. The two assemblies may be slightly different, such as using different connectors for connecting to different types of radio or intercom, or providing different microphone types or bias voltages. One use for such an arrangement is to allow the user to easily connect to both radio types without having to obtain a specialized single down-cable assembly able to connect to both radios.

[0039] In yet another example, shown in figure 11, a camera accessory 550 includes a camera 552. Applications for a headset-mounted camera include recording the pilot's operation of an aircraft as part of the flight record, allowing an instructor to see what a trainee pilot sees (whether live or after a flight), or simply recording the flight from the pilot's point of view for entertainment purposes. The camera accessory may include a trigger switch 554, built-in or wirelessly connected, to allow the pilot or a third party, such as an instructor, to initiate the capture of a still image or start and stop recording. A camera accessory may also be used with or integrated into the head-tracking accessory 204. Head motion data may be used to stabilize the image from the camera, or to map it to specific locations in a display when viewed later. For example, if a recording from the pilot's point of view is to be played back on a flight simulator, the picture should stay in place relative to the simulator, rather than moving around to follow where the pilot was looking.

[0040] In various of the above or other applications, two accessory modules may be used which need to communicate with each other. This may be accomplished in several ways, including the provision of additional wires in the headband, running an added wire between the modules separately from the headset, or by providing wireless transceivers, such as those discussed in regard to figure 8, in both modules. Any of the various accessories described may be combined with one or more of the others, such as combining the camera accessory with the wireless audio communication accessory or the head tracking with the biometric monitoring.

[0041] Other implementations are within the scope of the following claims and other claims to which the applicant may be entitled.

PATENT CITATIONS

Cited Patent	Filing date	Publication date	Applicant	Title
CH283612A *				<i>Title not available</i>
FR1392029A *				<i>Title not available</i>
FR2166276A1 *				<i>Title not available</i>
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WO2015110587A1 *	Jan 23, 2015	Jul 30, 2015	Hviid Nikolaj	Multifunctional headphone system for sports activities

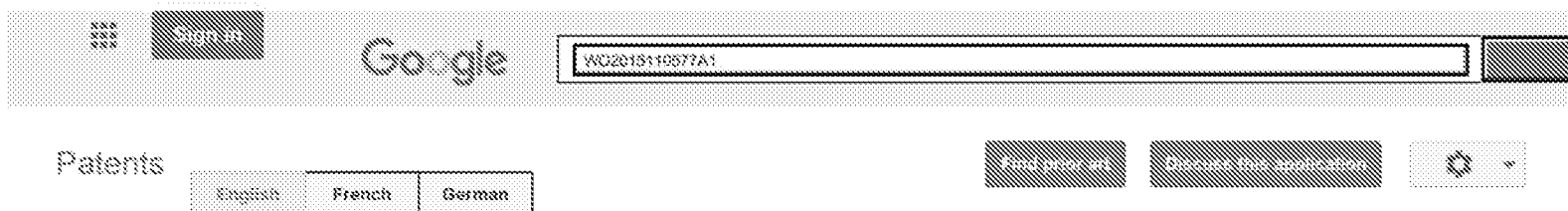
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CLASSIFICATIONS

International Classification	H04S7/00
Cooperative Classification	H04R5/033, H04R1/1091, H04R2420/03, H04G7/304, H04R1/1025, F21V21/084, H04R1/028

LEGAL EVENTS

Date	Code	Event	Description
May 14, 2014	121	Ep: the epo has been informed by wipo that ep was designated in this application	Ref document number: 13766188 Country of ref document: EP Kind code of ref document: A2



Stand-alone multifunctional headphones for sports activities

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ABSTRACT

An apparatus is described that has the following: (a) a housing that is set up to be worn in an ear, (b) a motion sensor unit for capturing motion data, (c) a physiological sensor unit for capturing physiological data, (d) a data processing unit that is set up to produce performance data on the basis of the motion data and/or the physiological data, (e) a signal processing unit that is set up to produce an audio signal on the basis of the performance data produced, and (f) a loudspeaker for outputting the audio signal produced, wherein the motion sensor unit, the physiological sensor unit, the loudspeaker, the data processing unit and the signal processing unit are integrated in the housing. In addition, a system, a method and a use are described.

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Inventors	Nikolaj Hviid
Applicant	Hviid Nikolaj
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DESCRIPTION translated from German

Independent multifunction headphone for sports activities

Field of inventions ung The invention relates to the field of multimedia devices with functionality for recording, evaluating and output of data with regard to sports

Activities or medical rehabilitation measures, in particular the field of portable systems, which are suitable for collection, analysis and output of any personal data in connection with the practicing of sports activities.

Background There is a variety of different systems that make it user in practicing sports activities possible, variety

performance-related and interesting information in other ways, such as heart rate, respiratory rate, speed, duration, and many other data, record and analyze, both during the application and after the practice of physical activity.

All these systems have in common that they consist of several parts, for example, one or more sensors, such as a heart rate belt, and a central unit, such as a sports watch, a

Bicycle computer or a smartphone.

Since many users also like listening to music or radio while they exercise sports activities, the user often has to bring three or more devices, such as a heart rate belt, a bike computer, an MP3 player and headphones. The present invention has for its object to provide a device that can provide the functionality of many devices previously required and is to easy and comfortable to wear and bring and easy to use.

Summary

This object is achieved by the subject matters of the independent

Claims. Advantageous embodiments of the present invention are described in the

CLAIMS (20) translated from German

Claims

1. An apparatus comprising:

- a housing which is adapted to be worn in an ear,
 - a motion sensor unit for detecting motion data, a physiological sensor unit for acquiring physiological data,
 - a data processing unit which is arranged to generate performance data based on the motion data and / or the physiological data,
 - a signal processing unit which is adapted to generate an audio signal based on the generated performance data, and
 - a speaker for outputting the generated Audiosignais, wherein the motion sensor unit, the physiological sensor unit, the speaker, the data processing unit and
- Signal processing unit are integrated in the housing.

- 2. A device according to claim 1, wherein the motion sensor unit has an accelerometer.
- 3. A device according to claim 1 or 2, wherein the physiological sensor unit comprises a pulse oximeter sensor.
- 4. The device according to one of the preceding claims, wherein the Audiosignal generated by the signal processing unit, one or more pre-stored speech elements or sound signals, which are indicative of at least a value of the performance data,
- 5. The device according to one of the preceding claims, wherein the signal processing unit for modifying pre-stored audio data in

dependent claims.

According to a first aspect of the invention, an apparatus is described. The device described comprises: (a) a housing which is adapted to be worn in an ear, (b) a motion sensor unit for detecting motion data, (c) a physiological sensor unit for acquiring physiological data, (d) a data processing unit, which is arranged to generate performance data based on the motion data and / or the physiological data, (e) a

Signal processing unit which is adapted to generate an audio signal based on the generated performance data, and (f) a speaker for outputting the audio signal generated, wherein the motion sensor unit, the physiological sensor unit, the speaker, the data processing unit and the signal processing unit are integrated in the housing.

The described device is set up in the ear for carrying and capable of independently producing an audio signal and to provide a user through the issue by means of a speaker is available, whereby the output audio signal based on movement data and / or physiological data integrated by the device Sensor units are recorded. Thus the user can obtain information regarding the sensed motion data and / or physiological data without the

Device with other devices connect to must. The device thus forms an autonomous entity that can be worn, for example, in connection with sports activities by the user in the ear while

various information can provide in terms of movement and / or physiological parameters of the user in real time.

In this document referred to as "sensor unit" in particular a unit with one or more individual sensors that is adapted to generate one or more electrical signals based on electric signals from each individual sensor.

In this document referred to as "motion sensor unit" in particular a sensor unit which is arranged to generate one or more electrical signals in response to movement of the sensor unit, in particular electrical signals that depend on a Beschleunigung, inclination or displacement of the sensor unit relative to one or more predetermined directions . In this document referred to as "motion data" in particular, a digital representation of one or more electrical signals, which are generated by the movement sensor unit.

Referred to in this document, "physiological sensor unit" in particular a sensor unit which is arranged to generate one or more electrical signals in dependence of one or more physiological values of a user.

This document refers to "physiological data" in particular a digital representation of one or more electrical signals that are generated by the physiological sensor unit. In this document, "Performance" refers in particular data that have values in terms of sports activities. Especially those values include values that are descriptive of the physical activity, such as a length of a way past, driven or distance swum or a height difference, and values that are descriptive of the user, such as speed, respiratory rate,

Blood oxygen saturation or heart rate.

The data processing unit is adapted to both the

Motion data from the motion sensor unit and the

physiological data of the physiological sensor unit, preferably als digital signals to obtain and process to generate performance data by calculation. Here, some values of performance solely based on the transaction data, other values of

Dependency is established by at least one value of the performance data.

6. The device according to one of the preceding claims, wherein the housing comprises a first portion and a second portion, the first portion for insertion into an ear canal and the second

Section are adapted for mounting in a pinna, with a shape and / or size of the second section is customizable.

7. The device according to one of the preceding claims, further comprising a capacitive sensor unit on a surface of the

Housing is arranged such that it can be touched by a user when the device is mounted in the user's ear.

8. The device according to one of the preceding claims, further comprising a microphone, in particular a bone conduction microphone for detecting user speech, in particular by the user

spoken voice commands, is set up,

9. The device according to one of the preceding claims, further comprising a electroencephalography sensor unit which is set up for detecting an electric Signals to a skin surface of a user.

10. The device according to any one of claims 7 to 9, further comprising a control unit which is integrated in the housing, and further for controlling the apparatus in response to touches, the capacitance of the

Sensor unit are detected, and / or as a function of

User Talk, which is detected by the microphone, and / or in

Response to an electrical signal which is detected by sensor unit Elektroenzephalografie-.

11. The device according to one of the preceding claims, further comprising a contact sensor for detecting whether the apparatus is mounted in the ear.

12. The device according to one of the preceding claims, further comprising a memory for storing the the

Data processing unit generated performance.

13. The device according to one of the preceding claims, further comprising a built-in housing communication unit for wireless data communication with an external device.

14. The device according to one of the preceding claims, further comprising a Nahfeldkommunikationseinheit.

15. The system comprising two devices according to one of the

preceding claims wherein both devices are configured for wireless data communication with each other.

16. System according to the preceding claim, wherein the

Signal processing unit of at least one of the two devices is arranged to generate a binaural audio signal based on the generated performance data.

17. System according to claim 15 or 16, wherein at least one of

performance solely based on the physiological data and additional values

Performance data are calculated based on both the movement data and the physiological data.

The signal processing unit is adapted to a Audiosignal based on performance data to produce such a way that a user while listening to the audio signal values, in particular one or more specific values of the performance data, changes in one or more specific values of the performance data and / or a relation between one or more specific values of the performance data and the corresponding reference thresholds, can recognize or know.

The data processing unit and the signal processing unit like the individual processing units (hardware) or they may be implemented on one or more processors (software) as functional units. The case in which the entire device is integrated is adapted to support in a user's ear. The housing is shaped so that the device can be good fits and detained in a typical ear, even during sporting activities. The housing preferably has an opening which is configured and positioned so that the speakers can deliver sound into the ear canal of the user.

In summary, the device that a user at the

Exerting a sporting activity Mittels listen on values of

Performance data is informed, the individual values of the performance on motion data and / or physiological data are based, which are recorded during exercise each of the motion sensor unit and the physiological sensor unit,

Thus, the apparatus provides a plurality of functionalities, without additional devices or external sensors are needed. The device is very compact, discreet and comfortable to wear in the ear. According to one embodiment of the invention the

Motion sensor unit on an accelerometer or a Beschleunigungssensor.

The accelerometer is arranged to detect acceleration and / or changes in acceleration in at least one predetermined direction relative to the housing. In a preferred embodiment, the

Accelerometer, a 3D accelerometer that can detect accelerations along three mutually perpendicular directions, and send three corresponding electrical signals. By processing the signals from the motion sensor unit, for example by means of pattern recognition, the data processing unit, for example, create the following and more performance: a

Step number value, a distance value and a speed value.

According to a further embodiment of the invention, the

physiological sensor unit to a pulse oximeter sensor, i.e. a sensor for non-invasive determination of arterial oxygen saturation on the measurement of light absorption.

The pulse oximetry sensor may comprise two differently colored light sources, especially LEDs, and a photo sensor and is preferably mounted in the housing such that the light sources may illuminate an area of skin surface in the user's ear and the photo sensor can detect corresponding reflections from the skin surface when the device is placed in the user's ear. The

Pulse oximetry sensor may be particularly appropriate in the area of a surface of the housing such that the pulse oximeter sensor with the skin surface when worn, the device in the ear in close contact in the ear, especially the skin surface in the area behind the tragus. (As the small tragus Knorpelmasse is referred to the ear, the ear canal just before the (external acoustic meatus) rests). Through

Driving the light sources and processing of the photo-sensor

signal output, the data processing unit, for example, create the following performance data, among other things: an arterial

Oxygen saturation value, a respiratory rate value, a cardiovascular flow value, a cardiac output value, a blood pressure value and a

Devices comprising a bone conduction microphone, and both devices comprise a microphone that is adapted for detecting ambient sound.

18. System according to the preceding claim, wherein at least one of said devices having a detection unit which is adapted for detecting predetermined movement pattern, resulting from stroking touches a body surface of a user.

19. A method comprising:

Detecting motion data by means of a motion sensor unit,

Measuring physiological data by means of a physiological sensor unit,

Based on the movement data and / or the physiological data by means of a data processing unit, generating a Audiosignals generated generating performance data based on the

Performance data by means of a signal processing unit, and

Outputting the audio signal generated by a speaker, wherein the motion sensor unit, the physiological sensor unit, the speaker, the data processing unit and

Signal processing unit are integrated into a housing that is set in the ear to wear.

20. Use of a device according to any one of claims 1 to 14 or a system according to one of claims 15 to 18 as a headset in conjunction with a mobile communication device.

Blood sugar levels.

According to another embodiment of the invention, the audio signal generated by the signal processing unit, one or more pre-stored Spracherelemente or sound signals, which are indicative of at least a level of performance, that is, to be acoustically by example tone, pitch, Hail, Echo, echo, Nachschall.

Three-dimensional perception or further the state and the constitution of the wearer to communicate ..

The generated Audiosignal like Beispielsweise of a name of a

Power value followed by the current value of the power value exist as beispielsweise "speed" followed by "23 kilometers per hour", "speed" followed by "Save Review 5 minutes and 17 seconds per kilometer" or "heart rate" followed by "155 beats per minute",

Alternatively, like the audio signal generated from a name

Power value followed by a pulsed Tonsignal exist, the pulse rate and / or pitch of the pulsed sound signal depends on the value of the power value. The user can change in the

Identify performance value by the pulse frequency and / or pitch of the beep to change. Further alternatively, like the audio signal generated only from a pulsed sound signal, as described above, are made.

According to a further Ausführungsbeispiel the invention is the

Signal processing unit for modifying pre-stored audio data, in particular music, a function of at least one value of the Performance data set.

Modifying the pre-stored audio data may in particular consist of a volume, a playback speed and / or pitch of the pre-stored audio data depending on the increase or reduce at least one value of the performance. In other words, the signal processing unit may, for example, the volume, playback speed and / or pitch of the pre-stored

Increase audio data when the heart rate an upper

Exceeds threshold, and reduce when the heart rate falls below a lower threshold value.

According to a further Ausführungsbeispiel of the invention, the housing has a first portion and a second portion, the first portion for insertion into an ear canal and the second portion are adapted for mounting in an auricle, wherein a shape and / or size of the second portion adapted is.

The first section is tapered and shaped in essence, that it fits in an outer part of the ear canal. The speaker is preferably mounted within the first section to deliver sound directly into the ear canal.

The second section is formed so that it can be used in the concha of the auricle of a typical ear and held there. The shape and / or size of the second section may, for example, by adding adhesive material on a portion of the surface of the second

Section to be adjusted..

The entire housing may be made in particular of plastic. The openings for speakers, sensors, etc. may be sealed watertight so that the device can also be used while swimming.

According to a further embodiment of the invention, the

Apparatus further comprises a capacitive sensor unit, which is arranged on a surface of the housing such that it can be touched by a user when the device is mounted in the user's ear. The capacitive Sensoreinheit may be mounted in particular on a surface of the housing which faces outwards when the device is mounted in the ear.

The capacitive sensor unit is arranged to detect touches, especially klopfenden or striking touches, which are made for example with a finger by the user.

According to a further Ausführungsbeispiel the invention, the

Device further comprises a microphone, in particular a

Bone conduction microphone for detecting user speech,

is especially spoken by the user voice commands, set up.

The use of a particular Knochenleitungsmikrofon enables that user speech can be recorded, to be influenced without (or only slightly) of ambient noise.

According to a further embodiment of the invention, the

Apparatus further includes electroencephalography sensor unit

(Brain current measurement), which is adapted for detecting an electrical signal to a skin surface of a user.

Through pattern recognition can from the detected electrical Signal predetermined brain activity when users are recognized, in particular personally exciting thoughts.

According to a further embodiment of the invention, the

Device further comprises a control unit which is integrated in the housing, and further for controlling the apparatus in response to touches, which are detected by the capacitive sensor unit and / or depending on the user saying that detected by the microphone, and / or in response to an electrical signal which is detected by Elektroenzephalografie- sensor unit.

Thus, the user can, for example, the functionality of the device by touching the capacitive sensor unit, by pronouncing

Voice commands and / or control by predetermined thoughts.

In particular may trigger on the capacitive sensor unit a first control signal one short touch (knocking), two consecutive short touches trigger a second control signal, etc. may Weiteren in a swipe up, down, forward and backward respectively predetermined control signals trigger.

According to a further embodiment of the invention, the

Device further comprises a contact sensor for detecting on whether the

Device is mounted in the ear.

The contact sensor may be particularly capacitive and be mounted on a part of the surface of the housing, the contact when worn in the ear, the skin surface. When the contact sensor has registered for a long time no contact with a skin surface, the device can be shadowed for example, in a standby mode or switched off completely.

According to a further embodiment of the invention, the

Apparatus further comprises a memory for storing the the

Data processing unit generated performance data,

By storing the performance data can be read later from memory and processed externally. Furthermore, can be accessed in the course of a sporting activity to the stored performance data to calculate for example, averages, or perform comparisons with previous activities, According to a further embodiment of the invention, the

Device further comprises a built-in housing communication unit for wireless data communication with an external device.

The communication unit may particularly be a Bluetooth device with which a wireless data communication can be performed with one or more external devices, such as a mobile phone, a smart phone, a tablet, a laptop computer, etc. Further, a data communication with a other similar or the same device carried, for example a device which is adapted to be worn in the other ear. The communication unit may be an infrared unit that enables data transmission with modulated infrared light alternatively.

According to a further Ausführungsbeispiel the invention, the

Apparatus further comprises Nahfeldkommunikationseinheit on (NFC unit).

The NFC unit allows storing and / or reading out various data to and from the device, for example, identification data of the user or GPS data indicating the last position of the device, such GPS data can be transferred, for example, regularly from a smartphone will.

According to a second aspect of the invention, a system is described which two devices according to the first aspect or any of the above

Comprises embodiments, wherein both devices are adapted to each other for wireless data communication, in particular
Mittels Bluetooth.

One of the two devices preferably functions as a primary device (master) in the system, in the sense that this device
transmits control and data signals to the second (secondary) device, in particular sensor signals, which detects from the
secondary device and the primary device are received, are taken into account in the generation of control and data signals in
the primary device.

The two devices can use the same audio signal or two
output different audio signals.

According to a Ausführungsbeispiel the invention is the

Signal processing unit of at least one of the two devices adapted to a binaural audio signal generated based on the
To generate performance data.

In this document "binaural audio signal" in particular an audio signal, which causes a spatial listening experience with precise
direction localization in spending in the two ears of a user. In other words, the user of a single component, such as a pulsed
sound signal, a binaural audio signal, a certain Assign position in three-dimensional space.

The binaural Audiosignal may be used to reproduce values regarding various performance data in different predetermined
locations in three-dimensional space around the user's head around, such as a first pulsed tone or voice signal regarding a
first power value at one point on the top left and second pulsed tone or voice signal respect, a second power value at one
point front bottom.

The binaural audio signal may also be used to reveal changes in a power value relative to a predetermined reference value
by changing the reproducing position. This can be done, for example, so that the position of a component of the Audiosignals
upwardly or forwardly moves when a Leistungswert exceeds a predetermined reference value or threshold, wherein the
amount of

Shift of the difference between the power value and the

Reference value depends. Similarly, the position of the component of the audio signal to the back or bottom are moved when
the power value to (or other) falls below the reference value or threshold. Illustrative of this could be implemented so that a
pulsed tone with respect to the heart rate of the user is listening to ear level as long as the heart rate is within a
predetermined range, such as 130-140 beats per minute, up

is shifted, when the heart rate of the maximum value

is exceeds predetermined range, and shifted downwards, when the heart rate to the minimum value of the predetermined
range

below.

According to a further Ausführungsbeispiel of the invention, at least one of the devices on and both a
Knochenleitungsmikrofon

Devices comprise a microphone for detecting

Ambient sound is established.

The Knochenleitungsmikrofon is particularly useful for detecting

Voice Commands furnished pronounced by the user to control the system. Here the value detected by the external
microphones ambient sound can be used for noise reduction to improve the detection of Sprachbefehle. The recognition of
voice commands as well as the processing for noise reduction are preferably carried out in a

corresponding signal processing unit, which is integrated in the primary device of the system.

According to a further Ausführungsbeispiel the invention includes at least one of the devices on a detection unit which is
adapted to detect a predetermined movement patterns in trending

Touching a body surface of a user are formed.

The detection unit is in particular to set up to receive a signal from the bone conduction microphone in the primary device, and signals from the microphones outwardly of the two devices and process. The processing has in particular an analysis of the time course of the pitch (frequency) and volume for each of the three signals. This processing of sound signals that have propagated through each and to the user's body around, allows a recognition of predetermined movement patterns, in particular the recognition of the direction of a striking touch of the user's body surface. Such a detection is based on the fact that the pitch and volume of the sensed signal from one of the microphones is increased during the movement when the movement is in the direction toward the microphone out and decreases when the movement is carried out away from the microphone. An analysis of the signal from the bone conduction microphone thus enables detection of whether the

Movement is directed upwards or downwards. Similarly, an analysis of the signals from the two microphones outwardly enables detection of whether the movement is to the left or right. By further analysis other three signals also oblique movements can be detected. In other words, the detection unit can detect when the user for example, draws a finger from left to right or from top to bottom across his cheek, chest or his stomach.

The recognition of such patterns of movement and contact patterns can advantageously or to control the devices, the system can be used. More specifically, may be associated with a predetermined control command of each detectable movement pattern. For example, increase the playback volume and reduce an upward movement the playback volume movement upwards.

According to a third aspect of the invention, a method will be described. The method described comprises the steps of: (a) detecting motion data by means of a motion sensor unit, (b) acquiring physiological data by means of a physiological sensor unit, (c)

Generating performance data based on the motion data and / or the physiological data by means of a data processing unit, (d) generating an audio signal based on the generated performance data by means of a signal processing unit, and (e) outputting the generated audio signal via a speaker, wherein the motion sensor unit, the physiological sensor unit, the speakers, the

Data processing unit and the signal processing unit in a

Housing are integrated, which is set up in the ear to wear.

The described method is essentially based on the same

Knowledge as the device described above in the first aspect and the Ausführungsbeispielen them, namely that motion data and physiological data are collected and processed in a separate device to an audio signal as a function of generated

To generate performance and output. According to a fourth aspect of the invention provides a use of a device or a system according to the first aspect or second aspect or any one of the above embodiments is described as a headset in conjunction with a mobile communication device, in particular a mobile phone, smartphone, or tablet.

The use as a headset allows, among other things, that the

various control functions of the apparatus or system are used for controlling the mobile communication device and that data, such as GPS data or voice commands by an application running on the mobile communication device navigation application, is transmitted to the device or the system.

The invention can be used both by means of a computer program, that is software, as well as means of one or more special electrical

Circuits, that is in hardware or in any hybrid form, that is to say by means of software components and hardware components can be realized.

It should be noted that embodiments of the invention have been described with reference to different subjects of the invention.

In particular, some embodiments of the invention are

Process claims and other embodiments of the invention described with device claims. The skilled person will however be immediately clear when reading this application that, unless explicitly stated otherwise, in addition to a combination of features belonging to one type of subject invention also any

Combination of features is possible, belonging to different types of the invention articles. Further advantages and features of the present invention will become apparent from the following exemplary description of a preferred

Embodiment.

Brief Description of Drawings

1 shows a block diagram of a device according to a

Ausführungsbeispiel.

Figure 2A shows a first view of an apparatus in accordance with a

Embodiment.

Figure 2B shows a second view of an apparatus according to a

Ausführungsbeispiel.

Figure 2C shows a third view of a device according to a

Ausführungsbeispiel.

Detailed Description

1 shows a device according to a Blockdiagramm

Ausführungsbeispiel. The device is integrated in a housing which is arranged in the ear for supporting and will be further described in more detail below in connection with Figures 2A, 2B and 2C and has a

Data processing unit 1, a signal processing unit 2, a

3 speakers, an accelerometer 4 and a pulse oximeter or a

5 pulse oximeter on. The data processing unit 1 receives data from the accelerometer 4 and the Pulseoximeter 5 and processes them to performance data, such as, for

To produce or calculate a Schritzzahl example, a distance, a speed, an arterial oxygen saturation, a respiration rate, a cardiovascular flow, a cardiac output, blood pressure, a Blutzuckerwert etc. The performance data are transmitted to the signal processing unit 2 and from the latter used to generate an audio signal that is output by the loudspeaker 3 into the user's ear. The

Audio signal is generated so that the user of the hearing

Schäus corresponding information on at least one value of the

May experience performance. This can be through the issue of language elements (for example, pre-stored numbers and words) or pulsed

Sound signals, carried out by manipulation of music or otherwise.

The apparatus further comprises a central control unit or controller 9 and a memory 11. The controller 9 is connected to the data processing unit 1, the signal processing unit 2, and the memory 11 and adapted to control these units and information from these

To obtain or read out units. The controller 9 controls, for example, what the performance data generated by the data processing unit 1, which is to consider the signal processing unit 2 in generating the audio signal, for example, whether the Audiosignal just information on heart rate, speed or what should be different. The controller can also control in such a way the signal processing unit 2, that in the memory 11

stored music or the like (for example, an audio book) is rendered independent of the performance.

The control unit 9 is further provided with a first microphone 7, a second microphone 14, a touch sensor unit 6, an EEG unit - (Elektroenzephalografie unit) 8, a contact sensor unit 10, a Bluetooth unit 12 and an NFC unit (Nahfeldkommunikationseinheit) 13. These units are also integrated in the housing and

generally allow that the user can influence or control the functionality of the device and that the device can communicate with an external device, such as a similar device, a smartphone or a computer.

The first microphone 7 is a bone conduction microphone that is mounted in the housing so that it can detect sound which is

passed through the skull bone, for example when speaking. A feature of the first microphone 7 is to capture user speaking, for Example! Voice commands to control the device or the user speaking, when the device is used as a headset in conjunction with an external device.

The second microphone 14 is mounted in the housing so that it can capture ambient sound in particular. By processing the signals of both the first microphone 7 and the second microphone 14 ambient noise of the users speak can be filtered, which improves the use of a headset and the recognition quality of voice commands. A further application of the two microphone signals is the

Detection of acoustic gestures, that is the recognition of certain moving or striking touches the body surface. More specifically like an acoustic gesture top Example! consist in the user a quick sweeping motion of his body or clothes in a certain direction (vertical, horizontal, etc.) makes a finger, the finger touched by the whole movement, the skin or clothing. Such stroking movements and sound is created by analyzing the 7 and 14 picked up by the microphones signals can direction, speed and other characteristics of the gesture to be recognized and converted into control signals. The touch sensor unit 6 comprises a plate having a plurality of capacitive sensors and is mounted on a portion of the surface of the housing, that the user can touch with your finger when the device is worn in the ear. In other words, there is the

Touch sensor unit 6 on a surface of the housing, from the

Ear canal facing away. Strike through and / or tapping with your finger on the touch sensor unit 6, the user can control the device. For example, the control unit 9 associate a trending upward movement with a volume increase and a trending downward movement with a volume reduction and control the signal processing unit 2 accordingly. Similarly, the control unit can connect eg a unique tapping on the touch sensor unit 6 with a function change and a twice repeated knocking with a selection of a function.

The EEG unit 8 has a plurality of electrodes which are so attached to the surface of the housing that measurements can be carried out by electrical potentials at the skin surface in the ear. These measurements are analyzed by the control unit and compared with pre-stored measurements to detect certain thoughts of the user and to use them as control commands. For example, the intensive thinking about their own favorite food trigger an announcement of the previous calorie consumption. The contact sensor unit 10 includes a capacitive sensor, in the so-

is mounted surface portion of the housing that it contacts when worn in the ear of the user's skin surface. Thus, the controller 9 can detect whether the device is used or not, and accordingly generate different control signals. For example,

Power consumption intensive functions are switched off some

Minutes after the device was removed from the ear. The Bluetooth unit 12 is used for wireless communication with other devices (for example, a worn in the other ear devices) or external devices (mobile phone, PC, etc.). If communication with a device in the other ear of the user sensor signals can be considered by both sides to provide improved precision in the

To achieve performance. Further, the audio signal generated

stereophonisch or binaural to be edited. In such systems,

does a device as the primary device or master in the sense that it receives data from both devices and processes and defines the respective audio signals to be output.

Communication with an external device, during use of the device, that is, during the exercise of a sporting activity to take place. In this case, data may, for example music or GPS data, are transmitted from the device to the apparatus, where they are used or stored. Simultaneously, data such as

For example, sensor data collected or calculated performance data, are transmitted from the device to the unit. This also allows use of the device as a headset in conjunction with

Communication applications.

Communication with the external device can also take place when the device is not in use in the ear, for example, the various above-described control options to configure to

Thresholds (for example, heart rate, respiratory rate, distance, time or speed etc.) to determine or to read performance data for external processing. This is expediently carried out by means of a specific application or app. NFC unit 13 enables communication with a

Nahfeldkommunikationsfähigen device, such as a smart phone, when the latter is brought into the vicinity of the device. If

can

Configuration data is transferred from the smartphone to the device or the device data stored in, for example,

Contact information for the user can be read. This information may be useful when the device lost

is found or in conjunction with an accident. Figures 2A, 2B and 2C show different views of an apparatus 20 according to an embodiment, in particular the shape of the housing, are integrated in which all the units of the apparatus 20.

Figure 2A shows a view of a device 20 having a housing. The housing is made of plastic, for example silicone, manufactured and basically has a first portion 21 and a second section 22. The first portion 21 is to be inserted into the ear canal of a user and the second section 22 is to be mounted in the concha of the

User formed. Here, the first portion 21 is substantially

Cone-shaped to fit well in the outer part of the ear canal. In the end region of the first section 21, an elastic collar 24

provided that works while wearing the apparatus 20 in the ear as a seal, so that the device 20 blocks the user's ear canal.

The second portion 22 is shaped so that it in the Concha

Can be used ear pinna of a typical and held there.

The housing also has a surface 23 which faces away from the ear canal, and thus the user top Example! is accessible by a finger. The surface 23 has in particular a capacitive

Sensor unit for detecting control commands from the user, top Example! if the user with his finger knocking on the surface 23 or sweeps over the surface 23 in a certain direction. Near the surface 23, the housing has a closable opening 25, through which a (not shown) plug can be coupled to a socket, to charge the battery of the device 20 or to transfer data to the apparatus 20 to be replaced.

The housing further has an opening 26 which is located in a place in the surface of the housing that contacts the device 20 when worn in the ear skin, in particular in the region behind the tragus, closely. The opening 26 may a pulse oximeter sensor enthalten, the two

differently colored light sources, especially LEDs, and a photo sensor has. In this case, the opening 26 is so mounted in the housing such that the light sources may illuminate an area of skin surface in the user's ear and the photo sensor can detect corresponding reflections from the skin surface. The opening 26 may alternatively include a Knochenleitungsmikrofon. In a system with two devices, a left to the ear and a right to the ear that a device like the Pulsoximetriesensor and the other device the

Have Knochenleitungsmikrofon.

Figure 2B shows a further view of the device 20, wherein the

Surface 23 can be seen in the foreground. The surface 23 has a gap or slot-shaped opening 27 which passes from the outside coming sound to a (not shown) microphone. The device 20 further comprises a collar or sleeve 28, the part of the surface 23 surrounds and is used to adjust the size of the device to a user's ear. The sleeve 28 is made of soft plastic and detachable from the housing, allows the user to experiment with different sleeves 28 with different sizes and choose the one that provides the best fit. Figure 2C shows yet Weitere view of the apparatus 20, the apparatus in comparison with the view in Figure 2B is rotated by 180 °.

As well as the collar 24 and the end of the first portion, which projects most deeply into the ear canal, have openings 29 through which the sound generated from a built-in speaker of the device, can be output,

The openings 25, 26, 27 and 29 are all waterproof sealed, so that the device 20 while swimming or rain can be used.

PATENT CITATIONS

Cited Patent	Filing date	Publication date	Applicant	Title
US20080076972 *	Mar 27, 2007	Mar 27, 2008	Apple Inc.	Integrated sensors for tracking performance metrics
US20080255430 *	Apr 16, 2007	Oct 16, 2008	Sony Ericsson Mobile Communications Ab	Portable device with biometric sensor arrangement
US20090097689 *	Aug 21, 2008	Apr 16, 2009	Christopher Prest	Sports Monitoring System for Headphones, Earbuds and/or Headsets

US20090105548 *

Oct 23, 2007

Apr 23, 2009

Bart Gary F

In-Ear Biometrics

* Filed by examiner

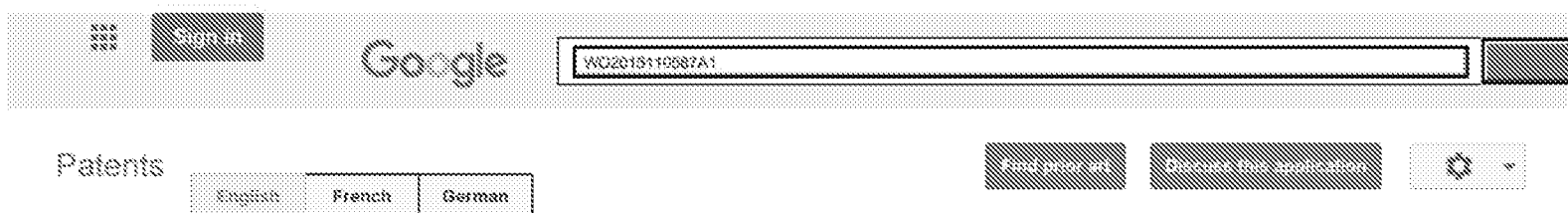
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LEGAL EVENTS

Date	Code	Event	Description
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Multifunctional headphone system for sports activities

WO 2015110587 A1

ABSTRACT

A multifunctional headphone system for sports activities is described that has the following: a first apparatus that is set up to be worn in one ear of a user and has a first data communication unit and a first loudspeaker, and a second apparatus that is set up to be worn in the other ear of the user and has a second data communication unit and a second loudspeaker, wherein at least one of the first and second apparatuses has a sensor unit and a data processing unit, wherein the data processing unit is set up to produce performance data on the basis of measurement data captured by the sensor unit, wherein the first apparatus additionally has a signal processing unit that is set up to produce a binaural audio signal on the basis of the performance data, the binaural audio signal having a first signal component for output by the first loudspeaker and a second signal component for output by the second loudspeaker, and wherein the first data communication unit is set up to transmit the second signal component of the binaural audio signal to the second data communication unit. In addition, a method is described.

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DESCRIPTION translated from German

Multifunctional headphone system for sports activities

Field of the invention The invention relates to the field of multimedia devices with functionality for recording, evaluating and output of data with regard to sports

Activities or medical rehabilitation measures, in particular the field of portable systems, which are suitable for collection, analysis and output of any personal data in connection with the practicing of sports activities.

Background There is a variety of different systems that make it user in practicing sports activities possible, variety

performance-related and interesting information in other ways, such as heart rate, respiratory rate, speed, duration, and many other data, record and analyze, both during the application and after the practice of physical activity.

Some of these systems are in need of a display device to the user information on the above information by outputting various audio signals, such as sounds or voice signals to quantify the information. This edition is the form but with significant

Limitations connected. Thus, for example, be given access to an alert individual information after another. Furthermore, the lack of a simple and intuitive way to provide information about the relationship between a current value and a preset threshold. The present invention has for its object to provide a headphone system for sporting activities, which provides information about performance-related information in a simple and intuitively easy detectable manner can give.

SUMMARY This object is achieved by the subject matters of the independent

Claims. Advantageous embodiments of the present invention are described in the dependent claims.

CLAIMS (11) translated from German

Claims

1. Multifunction headphone system for sporting activities, the system comprising:

a first device which is adapted to be worn in an ear of a user and having a first data communication unit and a first speaker, and

a second device which is adapted for wearing in the other ear of the user and having a second data communication unit and a second speaker,

wherein at least one of the first and second devices having a sensor unit and a data processing unit, wherein the

Data processing unit is arranged to generate performance data based on collected measurement data from the sensor unit,

wherein the first device further comprises a signal processing unit which is set up for generating a binaural audio signal based on the performance data, the binaural audio signal comprising a first signal part for output by the first loudspeaker and a second signal part for output by the second speaker, and

wherein the first data communication unit for transmitting the second signal part of the binaural audio signal to the second

Data communication unit is set up.

2. The system according to the preceding claim, wherein the binaural audio signal generated by the signal processing unit a

Comprising signal component is indicative of a value of the performance data.

3. The system according to the preceding claim, wherein the

According to a first aspect of the invention is a

Multifunctional headphone system for sporting activities described. The system described includes the following: (a) a first device which is adapted to be worn in an ear of a user and a first

Data communication unit and a first speaker, and (b) a second device which is adapted for wearing in the other ear of the user and a second data communication unit and a second speaker having, (c) wherein at least one of the first and second devices, a sensor unit and a having data processing unit, wherein the data processing unit for generating

Performance data is set based on detected measurement data from the sensor unit, (d) wherein the first apparatus further comprises

Having signal processing unit, which is adapted to generate a binaural audio signal based on the performance data, the binaural audio signal comprising a first signal part for output by the first speaker and a second signal part for output by the second speaker, and (e) the first data communication unit for transmitting the second signal part of the binaural audio signal is set to the second data communication unit.

The described system consists of two devices, each of which is to be worn in one ear (left and right) set up and has a speaker and a data communication unit. The first and second

Device can communicate with one another by means of the respective data communication units, and in particular, they can both transmit data to the other device and receive data from the other device. At least one of the two devices has a sensor unit and a data processing unit, the latter being for generating

Performance data is set based on measurement data of the

Sensor unit are recorded. The first (or second) device further includes a signal processing unit which is set up for generating a binaural audio signal based on the performance data. The binaural audio signal comprises a first signal part, which is provided for output by the first loudspeaker, and a second signal part, which is provided for output by the second speaker. The first

Data communication unit is for transmitting the second signal part of the binaural audio signal to the second data communication unit

arranged so that the second signal part can be outputted from the second speaker. By synchronized output of the first

Signal part in one ear and the second signal part in the other ear, the user can perceive the binaural audio signal and thus obtain information that is relevant for the application of a sporting activity.

In this document "binaural Audio signal" referred in particular an audio signal, which causes a spatial listening experience with precise direction localization in spending in the two ears of a user. In other words, the user of a single component, such as a pulsed sound signal, a binaural audio signal can assign a specific position in three-dimensional space.

In this document referred to as "sensor unit" particularly a unit having one or more individual sensors for generating one or more electrical signals (data) is set up based on electrical signals from each individual sensor.

In this document, "Performance" refers in particular data that have values in terms of sports activities. In particular, certain values include values that are descriptive of the physical activity, such as a length of a way past, driven or

Signal processing unit is further adapted to generate the binaural audio signal so that a spatial position of the

Signal component is dependent on the value of the performance.

4. The system according to the preceding claim, wherein the spatial position of the signal component relative to a plane dependent on a

Difference between the value of the performance data and a predetermined reference value.

5. The system according to any one of claims 2 to 4, wherein the binaural audio signal generated by the signal processing unit further

Comprising signal component that is indicative of an additional value of the performance data, and wherein the signal processing unit is further adapted to generate the binaural audio signal so that a spatial position of the further signal component is different from the spatial position of the signal component.

6. The system according to one of the preceding claims, wherein the signal processing unit is arranged for modifying pre-stored audio data in dependence on at least one value of the performance data.

7. The system according to one of the preceding claims, wherein the first data communication unit and the second

Data communication unit data wireless communication units that are adapted to communicate with each other.

8. The system according to one of the preceding claims, wherein the sensor unit comprises a physiological sensor unit.

9. The system according to one of the preceding claims, wherein the sensor unit includes a motion sensor unit.

10. The system according to the preceding claim, wherein both

Devices have a motion sensor unit.

11. A method comprising:

Detecting measurement data by a sensor unit,

Generating performance data based on the measurement data by means of a data processing unit,

wherein the sensor unit and the data processing unit in a first device, which is adapted to be worn in an ear of a user and having a first data communication unit and a first speaker, or in a second device, which is adapted for wearing in the other ear of the user and a second data communication unit and a second speaker having included,

Generating a binaural audio signal based on the

Performance data by means of a signal processing unit, which is part of the first device, the binaural audio signal comprising a first signal part for output by the first speaker and a second signal part for output by the second speaker, and

Transmitting the second signal part of the binaural audio signal to the second data communication unit using the first

Data communication unit.

distance swum or a difference in height, and values that are descriptive of the user, such as speed, respiratory rate,

Blood oxygen saturation or heart rate.

The data processing unit is adapted to receive the measurement data from the sensor unit, preferably as digital signals, and process to generate performance data through calculation.

The signal processing unit is adapted, based on performance data to produce a binaural audio signal such that a user while listening the binaural audio signal one or more specific values of the performance data, changes in one or more specific values of the performance data and / or a relation between one or more can recognize and learn specific values of performance data and corresponding reference values, in particular thresholds. The binaural audio signal enables in particular that information about multiple values simultaneously listen to different spatial locations. The data processing unit and the signal processing unit like the individual processing units (hardware) or they may be implemented on one or more processors (software) as functional units.

Each device has a housing, in which the respective entire

Device is integrated. Each case is to be worn in the ear of a

User set. Here each case is shaped so that the respective device can be good fits and detained in a typical (left or right) ear, even during sporting activities. Each housing preferably has an opening which is configured and positioned such that the (first or second) speaker sound can emit into the ear canal of the user. In summary, the system that a user is informed by practice a sporting activity by binaural audio output through values of performance, the individual values of performance data are based on measurement data of during athletic activity

Sensor unit are recorded.

Thus, the system provides a variety of functionalities without additional devices or external sensors are needed, and in particular allows an output of performance-related information in a simple and intuitively easy detectable manner. Here, the

Devices of the system very compact, discreet and comfortable to wear in the ear.

According to one embodiment of the invention, has the

Signal processing unit produced binaural audio signal a

Signal component that is indicative of a value of the performance data. In this document referred to as "signal component" a particular part of the binaural audio signal, the user of the other

Can distinguish components of the audio signal or clearly

can identify. Specifically, the user of the signal component can assign a spatial position, that is, it can detect a direction from which the signal component will play.

The signal component may have, in particular pre-recorded speech elements or a sound signal.

The signal component may for example consist of a name of the value followed by the current value of the value, such as "speed" followed by "23 kilometers per hour", "speed" followed by "Save Review 5 minutes and 17 seconds per kilometer" or "heart rate" followed by "155 beats per minute."

Alternatively, the signal component may consist of a name of the value followed by a pulsed sound signal, wherein the pulse rate and / or pitch of the pulsed sound signal depends on the value of the performance data. Here the user can recognize changes in the value by the pulse frequency and / or pitch of the beep to change.

Further alternatively, like the signal component only of a pulsed sound signal, as described above, are made.

According to a further embodiment of the invention is the

Signal processing unit further to set up to generate the binaural audio signal so that a spatial position of the signal component is dependent on the value of the performance. In other words, the spatial position of the signal component is shifted if the relevant value changes. This can be done, for example, so that the signal component is shifted forward or upward, if the value increases, and is displaced backward or downward, when the value decreases.

According to a further Ausführungsbeispiel of the invention is the spatial position of the signal component relative to a plane

dependent on a difference between the value of the performance data and a predetermined reference value.

The level may in particular by the user or a horizontal plane body through the head (near the ear) to be user a vertical plane. As long as the signal component will play in one of these levels, that is, directly to the left or right side of the user, or at the level of the user's ears, then the value is equal to or close to the predetermined reference value.

If the value exceeds the predetermined reference value or threshold, the position of the signal component is shifted, for example towards the front or upwards, wherein the amount of shift of the difference between the power value and the reference value is dependent. Similarly, the position of the signal component downward or backward are moved when the value of the (or another)

Reference value or falls below threshold. Illustrative of this could be implemented, that a pulsed tone with respect to the heart rate of the user is listening to ear level as long as the heart rate is within a predetermined range, such as 130-140 beats per minute, will be moved upward, if the heart rate exceeds the maximum of the predetermined range, that is, 140

Beats per minute, and move downward, when the heart rate falls below the minimum value of the predetermined range, that is, 130

Beats per minute.

Thus, the user can easily and intuitively recognize whether the value of the predetermined reference value deviates, and if this is the case,

act accordingly, by the value again to the predetermined

To approach the reference value.

According to a further embodiment of the invention, the binaural audio signal generated by the signal processing unit further

Signal component that is indicative of an additional value of the performance data, and the signal processing unit is further to adapted to generate the binaural audio signal so that a spatial position of the further signal component is different from the spatial position of the signal component.

When the binaural audio signal having a plurality of signal components can thus values with respect to different performance at different predetermined locations in the three-dimensional space around the head of

User around to play. For example, a first pulsed tone or voice signal regarding a first power value at one point on the top left and a second pulsed tone or voice signal with respect. Of a second power value at one point are forward play below. The playback of each signal component may take place simultaneously or at different times.

According to a further embodiment of the invention is the

Signal processing unit arranged for modifying pre-stored audio data in dependence on at least one value of the performance data. Modifying the pre-stored audio data may in particular consist of a volume, a playback speed and / or pitch of the pre-stored audio data depending on the increase or reduce at least one value of the performance. In other words, the signal processing unit may, for example, the volume, playback speed and / or pitch of the pre-stored

Increase audio data when the heart rate an upper

Exceeds threshold, and reduce when the heart rate falls below a lower threshold value.

According to a further embodiment of the invention, the first data communication unit and the second data communication unit, wireless data communication units are arranged to communicate with each other.

The data communication units may be particularly Bluetooth units, with wireless data communication between the two

Can be carried out devices to transfer measurement data, performance data and audio signals reversed from one device to another device and.

At least one of the wireless data communication units may also be adapted for wireless data communication with an external device, such as a mobile phone, a smart phone, a tablet, a laptop computer, etc. The data communication unit may optionally include an infrared unit, a data transmission with a modulated allows infrared light.

According to a further embodiment of the invention, the

Sensor unit a physiological sensor unit. In this document, "physiological sensor unit" particularly denotes a sensor unit for

generating one or more electrical

Signals is set up as a function of one or more physiological values of a user.

The physiological sensor unit may particularly comprise a pulse oximeter sensor, i.e. a sensor for non-invasive determination of arterial oxygen saturation on the measurement of light absorption. This may be two differently colored light sources, in particular light-emitting diodes, and having a photo sensor and is preferably mounted in such a way in the housing of the device that the light sources of a portion of the

Can shed light on the skin surface in the user's ear and the photo sensor can detect respective reflections from the skin surface when the device is mounted in the user's ear. The pulse oximetry sensor may in particular in the area of a surface of the housing such

be mounted so that the pulse oximeter sensor, the while wearing

Device is in the ear in close contact with the skin surface in the ear, especially the skin surface in the area behind the tragus. (As the small tragus cartilage of the outer ear is called that shortly before the ear canal (external auditory meatus) rests). By controlling the

Light sources and processing of the output from the photo sensor signal, the data processing unit, for example, create the following performance data, among other things: an arterial oxygen saturation value, a respiratory rate value, a cardiovascular flow value, a

Cardiac output value, a blood pressure value and a blood glucose level.

According to a further embodiment of the invention, the

Sensor unit motion sensor unit to a. In this document referred to as "motion sensor unit" in particular a sensor unit which is arranged to generate one or more electrical signals in response to movement of the sensor unit, in particular electrical signals that depend on an acceleration, inclination or displacement of the sensor unit relative to one or more predetermined directions ,

The motion sensor unit may particularly comprise an accelerometer or an acceleration sensor, or for detecting

Acceleration and / or changes in acceleration is arranged in at least one predetermined direction relative to the housing of the device. In a preferred embodiment the accelerometer is a 3-D

Accelerometer that can detect accelerations along three mutually perpendicular directions, and send three corresponding electrical signals. By processing the signals from the motion sensor unit,

for example by means of pattern recognition, the data processing unit, for example, create the following and more performance: a

Step number value, a distance value and a speed value. According to a further embodiment of the invention both have

Devices motion sensor unit to a.

By processing of transaction data that is collected in the field of both ears of the user, an increased precision of the performance can be achieved.

The data processing unit may be particularly configured to receive both the measurement data from the movement sensor unit (transaction data) and the measurement data from the physiologic sensor unit (physiological data), preferably as digital signals, and processed to generate performance data through calculation. In this case, some values of the performance based solely on the motion data, other values of the performance data are calculated solely based on the physiological data and further values of the performance data based on both the movement data and the physiological data.

In summary, the system that a user is informed by practice a sporting activity by binaural audio output through several levels of performance, with the individual values of the performance on motion data and / or physiological data based that the during exercise each of

Motion sensor unit and / or the physiological sensor unit are recognized, and sounding signal component are represented by at different spatial locations around the user's head around. According to a further embodiment of the invention, the housing of each device a first portion and a second portion, the first portion for insertion into an ear canal and the second portion are adapted for mounting in an auricle, wherein a shape and / or size of the second section is customizable.

The first section is tapered and shaped in essence, that it fits in an outer part of the ear canal. The speaker is preferably mounted within the first section to deliver sound directly into the ear canal.

The second section is formed so that it can be used in the concha of the auricle of a typical ear and held there. The shape and / or size of the second section may, for example, by adding adhesive material on a portion of the surface of the second

Section to be adjusted. The entire housing may be made in particular of plastic. The openings for speakers, sensors, etc. may be sealed watertight so that the device can also be used while swimming. According to a further embodiment of the invention further comprises at least one of the devices on a capacitive sensor unit which is arranged on a surface of the housing such that it can be touched by a user when the device is mounted in the user's ear.

The capacitive sensor unit may be mounted in particular on a surface of the housing which faces outwards when the device is mounted in the ear. The capacitive sensor unit is arranged to detect touches, especially beeping or striking touches, which are made for example with a finger by the user.

According to a further embodiment of the invention further comprises at least one of the devices to a microphone, in particular a

Bone conduction microphone for detecting user speech,

is especially spoken by the user voice commands, set up.

The use of a bone conduction microphone allows particular that users speak can be detected without being affected (or only slightly) of ambient noise.

According to a further embodiment of the invention further comprises at least one of the devices on an electroencephalography sensor unit (brain current measurement), which is adapted for detecting an electrical signal to a skin surface of a user. Through pattern recognition predetermined brain activity at the user can be detected from the detected electrical signal, especially personally exciting thoughts.

According to a further embodiment of the invention further comprises at least one of the devices has a control unit which is integrated in the housing, and further for controlling the apparatus in response to touches, which are detected by the capacitive sensor unit and / or depending on the user saying that detected by the microphone, and / or in response to an electrical signal received from

Electroencephalography sensor unit is detected.

Thus, the user can, for example, the functionality of the device by touching the capacitive sensor unit, by speaking voice commands and / or predetermined by thought control.

In particular may trigger on the capacitive sensor unit a first control signal one short touch (knocking), two consecutive short touches trigger a second control signal, etc. Further, like a swipe up, down, forward and backward respectively predetermined control signals trigger.

According to a further embodiment of the invention further comprises at least one of the devices on a contact sensor for detecting whether the apparatus is mounted in the ear.

The contact sensor may be particularly capacitive and be mounted on a part of the surface of the housing, the contact when worn in the ear, the skin surface. When the contact sensor has registered for a long time no contact with a skin surface, the device can be connected, for example in a standby mode or switched off completely.

According to a further embodiment of the invention, at least one of the devices furthermore a memory for storing the performance data generated by the data processing unit.

By storing the performance data can be read later from memory and processed externally. Furthermore, can be accessed in the course of a sporting activity to the stored performance data to calculate for example, averages, or perform comparisons with previous activities.

According to a further embodiment of the invention further comprises at least one of the devices on a Nahfeldkommunikationseinheit (NFC unit).

The NFC unit enables storing and / or reading out various data in or from the apparatus, for example, identification data of the user or GPS data indicating the last position of the device. Such GPS data can be transferred, for example, regularly from a smartphone.

Generally, one of the two devices of the system preferably functions as a primary device (master) in the system, in the sense that this device transmits control and data signals to the second (secondary) device, in particular sensor signals sensed by the secondary device and are transmitted to the primary device, are taken into account in the generation of control and data signals in the primary device. According to a further embodiment of the invention, at least one of the devices of the system, a bone conduction microphone, and both devices comprise a microphone for detecting

Ambient sound is established.

The bone conduction microphone is particularly useful for detecting

Voice Commands furnished pronounced by the user to control the system. Here the value detected by the external microphones ambient sound can be used for noise reduction to improve the recognition of voice commands. The recognition of voice commands as well as the processing for noise reduction are preferably carried out in a

corresponding signal processing unit, which is integrated in the primary device of the system. According to a further embodiment of the invention, at least one of the devices of the system, a detection unit which is adapted for detecting predetermined movement patterns, at the

trending touches a body surface of a user created. The detection unit is in particular to set up to receive a signal from the bone conduction microphone in the primary device, and signals from the microphones outwardly of the two devices and process. The processing has in particular an analysis of the time course of the pitch (frequency) and volume for each of the three signals. This processing of sound signals to each through and around

The user's body around have propagated, enables detection of predetermined movement patterns, in particular the recognition of the direction of a striking touch of the user's body surface. Such a detection is based on the fact that the pitch and volume of the sensed signal from one of the microphones is increased during the movement when the movement is in the direction toward the microphone out and decreases when the movement is carried out away from the microphone. An analysis of the signal from the bone conduction microphone thus enables detection of whether the movement is upward or downward. Similarly, an analysis of the signals from the two microphones outwardly enables detection of whether the movement is to the left or right. By further analysis of all three signals also oblique movements can be detected.

In other words, the detection unit can detect when the user, for example a finger from left to right or top to bottom on his cheek. Chest or his stomach pulls.

The recognition of such patterns of movement and contact patterns can be advantageously used to control the devices or system. More specifically, may be associated with a predetermined control command of each detectable movement pattern. For example, increase the playback volume and reduce an upward movement the playback volume movement upwards. The system may as a headset in conjunction with a mobile

Communication apparatus can be used, in particular a

Mobile phone, smartphone or tablet.

The use as a headset allows, among other things, that the

control various functionalities of the system are used for controlling the mobile communication device and that data, such as GPS data or voice commands is transmitted from an application running on the mobile communication device navigation application, to the system. According to a second aspect of the invention, a method will be described. The method described comprises the steps of: (a) detecting measurement data by a sensor unit, (b) generating performance data based on the measurement data by means of a data processing unit, wherein the sensor unit and the data processing unit in a first

Device, which is adapted to be worn in an ear of a user and a first data communication unit and a first speaker having, or at a second device, which is adapted for wearing in the other ear of the user and having a second data communication unit and a second speaker are, (c) generating a binaural audio signal based on the performance data by a signal processing unit, which is part of the first device, the binaural audio signal comprising a first signal part for output by the first speaker and a second signal part for output by the second speaker, and (d) transmitting the second signal part of the binaural audio signal to the second data communication unit using the first data communication unit.

The described method is essentially based on the same

Knowledge as the system described above in the first aspect and the embodiments thereof, which is that metrics such as transaction data and / or physiological data are collected and processed in at least one of two independent means to generate a binaural audio signal as a function of the generated performance data and outputting.

The invention can be used both by means of a computer program, that is software, as well as means of one or more special electrical

Circuits, that is in hardware or in any hybrid form, that is to say by means of software components and hardware components can be realized. It should be noted that embodiments of the invention have been described with reference to different subjects of the invention.

In particular, some embodiments of the invention are

Process claims and other embodiments of the invention described with device claims. The skilled person will however be immediately clear when reading this application that, unless explicitly stated otherwise, in addition to a combination of features belonging to one type of subject invention also any

Combination of features is possible, belonging to different types of the invention articles.

Further advantages and features of the present invention will become apparent from the following exemplary description of a preferred

Embodiment.

Brief Description of Drawings

1 shows a block diagram of one of the two devices of a system according to an embodiment.

Figure 2A shows a first view of an apparatus in accordance with a

Embodiment. Figure 2B shows a second view of an apparatus according to a

Embodiment.

Figure 2C shows a third view of a device according to a

Embodiment.

Figure 3 shows a system according to an embodiment. Detailed Description Figure 1 shows a block diagram of one of the two devices of a system according to an embodiment. The device is integrated in a housing which is arranged in the ear for supporting and will be further described in more detail below in connection with Figures 2A, 2B and 2C, and has a data processing unit 1, a signal processing unit 2, a speaker 3, an accelerometer 4 and a pulse oximeter and a pulse oximeter to 5.

The data processing unit 1 receives data from the accelerometer 4 and the pulse oximeter 5 and processes these to performance, such

To generate or calculate as a number of steps, a distance, a speed, an arterial oxygen saturation, a respiration rate, a cardiovascular flow, a cardiac output, blood pressure, a blood glucose level etc.. The performance data are transmitted to the signal processing unit 2 and from the latter used to generate an audio signal that is output by the loudspeaker 3 into the user's ear. The

Audio signal is generated so that the user of the hearing

corresponding sound information about at least one value of the

May experience performance. This can be through the issue of language elements (for example, pre-stored numbers and words) or pulsed

Sound signals, carried out by manipulation of music or otherwise.

The apparatus further comprises a central control unit or controller 9 and a memory 11. The controller 9 is connected to the Datenverarbeitungseinheit 1, the signal processing unit 2, and the memory 11 and adapted to control these units and information from these

To obtain or read out units. The controller 9 controls, for example, what the performance data generated by the data processing unit 1, which is to consider the signal processing unit 2 in generating the audio signal, for example, whether the audio signal straight information on heart rate, speed or what should be different. The controller can also control in such a way the signal processing unit 2, that in the memory 11

stored music or the like (for example, an audio book) is rendered independent of the performance.

The control unit 9 is further provided with a first microphone 7, a second microphone 14, a touch sensor unit 6, an EEG unit - (electroencephalography unit) 8, a contact sensor unit 10, a Bluetooth unit 12 and an NFC unit (Nahfeldkommunikationseinheit) 13. These units are also integrated in the housing and

generally allow that the user can influence or control the functionality of the device and that the device can communicate with an external device, such as a similar device, a smartphone or a computer.

The first microphone 7 is a bone conduction microphone that is mounted in the housing so that it can detect sound which is passed through the skull bone, for example when speaking. A function of the first microphone 7 is to detect user speaking, for example, voice commands for controlling the device or the user speaking, when the device is used as a headset in conjunction with an external device.

The second microphone 14 is mounted in the housing so that it can capture ambient sound in particular. By processing the signals of both the first microphone 7 and the second microphone 14 ambient noise of the users speak can be filtered, which improves the use of a headset and the recognition quality of voice commands. A further application of the two microphone signals is the detection of acoustic gestures, that is, the detection of certain moving or sweeping touches the body surface. More specifically like an acoustic gesture for example are that the user a quick sweeping motion of his body or clothes in a certain direction (vertical, horizontal, etc.) makes a finger, the finger by the whole movement, the skin or clothing touches. Such stroking movements and sound is created by analyzing the 7 and 14 picked up by the microphones signals can direction, speed and other characteristics of the gesture to be recognized and converted into control signals.

The touch sensor unit 6 comprises a plate having a plurality of capacitive sensors and is mounted on a portion of the surface of the housing, that the user can touch with your finger when the device is worn in the ear. In other words, the touch sensor unit 6 is located on a surface of the housing, from the

Ear canal facing away. Strikethrough and / or tapping with your finger on the touch sensor unit 6, the user can control the device. For example, the control unit 9 associate a trending upward movement with a volume increase and a trending downward movement with a volume reduction and control the signal processing unit 2 accordingly. Similarly, the control unit can connect eg a unique tapping on the touch sensor unit 6 with a function change and a twice repeated knocking with a selection of a function.

The EEG unit 8 has a plurality of electrodes which are so attached to the surface of the housing that measurements can be carried out by electrical potentials at the skin surface in the ear. These measurements are analyzed by the control unit and compared with pre-stored measurements to detect certain thoughts of the user and to use them as control commands. For example, the intensive thinking about their own favorite food trigger an announcement of the previous calorie consumption. The contact sensor unit 10 includes a capacitive sensor that is mounted in the surface region of the housing that it contacts when worn in the ear of the user's skin surface. Thus, the controller 9 can detect whether the device is used or not, and accordingly generate different control signals. For example,

Power consumption Intensive functions are switched off some

Minutes after the device was removed from the ear.

The Bluetooth unit 12 is used for wireless communication with other devices (for example, a worn in the other ear devices) or external devices (mobile phone, PC, etc.). If communication with a device in the other ear of the user sensor signals can be considered by both sides to provide improved precision in the

To achieve performance. Further, the audio signal generated

edit stereofonisch or binaural. In such systems,

does a device as the primary device or master in the sense that it receives data from both devices and processes and defines the respective audio signals to be output.

Communication with an external device, during use of the device, that is, during the exercise of a sporting activity to take place. In this case, data may, for example music or GPS data, are transmitted from the device to the apparatus, where they are used or stored. Simultaneously, data such as

For example, sensor data collected or calculated performance data, are transmitted from the device to the unit. This also allows use of the device as a headset in conjunction with

Communication applications.

Communication with the external device can also take place when the

Device is not used in the ear to configure for example to the various above-described control ways

Thresholds (for example, heart rate, respiratory rate, distance, time or speed etc.) to determine or to read performance data for external processing. This is expediently carried out by means of a specific application or app.

The NFC unit 13 enables communication with a

Nahfeldkommunikationsfähigen device, such as a smart phone, when the latter is brought into the vicinity of the device. It can

Configuration data is transferred from the smartphone to the device or the device data stored in, for example,

Contact information for the user can be read. This information may be useful when the device lost

is found or in conjunction with an accident.

Figures 2A, 2B and 2C show different views of an apparatus 20 according to an embodiment, in particular the shape of the housing, are integrated in which all the units of the apparatus 20. Figure 2A shows a view of a device 20 having a housing. The housing is made of plastic, for example silicone, manufactured and basically has a first portion 21 and a second section 22. The first portion 21 is to be inserted into the ear canal of a user and the second section 22 is to be mounted in the concha of the

User formed. Here, the first portion 21 is substantially

Cone-shaped to fit well in the outer part of the ear canal. In the end region of the first section 21, an elastic collar 24

provided that works while wearing the apparatus 20 in the ear as a seal, so that the device 20 blocks the user's ear canal. The second portion 22 is shaped so that it in the Concha

Can be used ear pinna of a typical and held there.

The housing also has a surface 23 which faces away from the ear canal and thus, for example with a finger reachable by the user. The surface 23 has in particular a capacitive

Sensor unit for detecting control commands from the user, for example if the user with his finger on the surface 23 knocks or sweeps over the surface 23 in a particular direction. Near the surface 23, the housing has a closable opening 25, through which a (not shown) plug can be coupled to a socket, to charge the battery of the device 20 or to transfer data to the apparatus 20 to be replaced.

The housing further has an opening 26 which is located in a place in the surface of the housing that contacts the device 20 when worn in the ear skin, in particular in the region behind the tragus, closely. The opening 26 may include a pulse oximeter sensor, the two

differently colored light sources, especially LEDs, and a photo sensor has. In this case, the opening 26 is so mounted in the housing such that the light sources may illuminate an area of skin surface in the user's ear and the photo sensor can detect corresponding reflections from the skin surface. The opening 26 may alternatively include a bone conduction microphone. In a system with two devices, a left to the ear and a right to the ear that a device like the pulse oximeter and the other device the

Have bone conduction microphone. Figure 2B shows a further view of the device 20, wherein the

Surface 23 can be seen in the foreground. The surface 23 has a gap or slot-shaped opening 27 which passes from the outside coming sound to a (not shown) microphone. The device 20 further comprises a collar or sleeve 28, the part of the surface 23 surrounds and is used to adjust the size of the device to a user's ear. The sleeve 28 is made of soft plastic and detachable from the housing. Thus, the user can try different sleeves 28 with different sizes and choose the one that provides the best fit.

Figure 2C shows yet another view of the apparatus 20, the apparatus in comparison with the view in Figure 2B is rotated by 180 °.

As well as the collar 24 and the end of the first portion, which in the

Auditory canal extends deepest, have openings 29 through which the sound generated from a built-in speaker of the device, can be output. The openings 25, 26, 27 and 29 are all waterproof sealed, so that the device 20 while swimming or rain can be used.

Figure 3 shows a system according to an embodiment. The system comprises a first device and a second device 20L, 20R. The first device 20R is adapted to be worn in the right ear and the second device is adapted to be worn in the left ear. Each device 20R and 20L are essentially the apparatus 20 described above, but, the first device 20R, a bone conduction microphone 7 in its opening 26, the second device 20L a pulse oximeter sensor 5 has in its opening 26. The first device 20R functions as a primary device or master in the sense that it receives data from both devices 20R, 20L and processes and defines the respective outputted Audiosignale. The two devices 20 R and 20L communicate with each other over their respective Bluetooth unit 12 (see Figure 1) and can thus sensor data.

Replacing performance data, audio data, control data, etc. In operation, the secondary device 20L sends particular Pulsometerdaten and

Motion sensor data or performance data, which are derived from Pulsometerdaten and / or motion sensor data to the primary device 20R. The data processing unit 1 of the first device 20R generates performance data based on the data and the measurement data detected by its own sensor unit received from the second device 20L. The performance data are used by the signal processing unit 2 of the first device for generating a binaural audio signal.

The binaural audio signal consists of a first (right) signal portion, which is output through the speaker 3 of the first device 20R, and a second (left) signal part transmitted to the second device via the Bluetooth connection and output from the speaker 3 becomes. By synchronized output of the first signal part in the right ear and the second signal part in the left ear, the user can binaural

Perceive audio signal and thus obtain information that is relevant for the application of a sporting activity. Specifically, the user may have a while listening the binaural audio signal or a plurality of specific values of the performance data, changes in one or more specific values of the performance data and / or a relation between one or more specific values of the performance data and

corresponding reference values, especially thresholds recognize or know. The binaural audio signal enables, in particular, that information on a plurality of values simultaneously (or nearly simultaneously) can be heard at different spatial positions.

The binaural audio signal generated contains a signal component, for example a pulsed audio signal or a sequence of pre-stored speech elements, which is indicative of a value of the performance data. This signal component can be heard for the user at a particular spatial location. This spatial position can be moved or changed, if changes to the corresponding value of the performance. This can be done, for example, so that the signal component is shifted forward or upward, if the value increases, and is displaced backward or downward, when the value decreases. The displacement of position can, in particular relative to a vertical plane extending through the user's body, or a horizontal plane defined by the head extends (at the level of the ears) of the user occur. As long as the

Signal component is to play in one of these levels, that is, directly to the left or right side of the user, or at the level of the user's ears, then the value is equal to or close to a predetermined reference value. If the value of the predetermined reference value or

Exceeds threshold value, the position of the signal component to be

Example forward or moved upward, wherein the amount of

Shift of the difference between the power value and the

Reference value depends. Similarly, the position of the

Signal component to be moved down and back or if the value of the (or another) reference value or threshold

below.

Thus, the user can easily and intuitively recognize whether the value of the predetermined reference value deviates, and if this is the case,

act accordingly, by the value again to the predetermined

To approach the reference value. The binaural audio signal is produced may contain other signal component, which are indicative for other values of the performance data. In this case, the binaural audio signal is generated so that a spatial

position of each signal component of the spatial position of the other signal is different components. This values can be reproduced in various performance data in different predetermined locations in three-dimensional space around the user's head around in terms. For

Example, a first pulsed tone or voice signal regarding the heart rate at a point on the top left and a second pulsed

Will play at one point front lower tone or voice signal with respect. A speed. The playback of each signal component may simultaneously or slightly offset in time take place in order to facilitate the perception by the user.

PATENT CITATIONS

Cited Patent	Filing date	Publication date	Applicant	Title
WO2014043179A2 *	Sep 11, 2013	Mar 20, 2014	Bose Corporation	Powered headset accessory devices
US20080076972 *	Mar 27, 2007	Mar 27, 2008	Apple Inc.	Integrated sensors for tracking performance metrics
US20090097689 *	Aug 21, 2008	Apr 16, 2009	Christopher Prest	Sports Monitoring System for Headphones, Earbuds and/or Headsets

* Cited by examiner

CLASSIFICATIONS

International Classification	H04R25/00, H04R5/033, H04R1/10
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LEGAL EVENTS

Date	Code	Event	Description
Sep 9, 2015	121	Ep: the epo has been informed by wipo that ep was designated in this application	Ref document number: 15701341 Country of ref document: EP Kind code of ref document: A1

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EFS ID:	26792527
Application Number:	15245031
International Application Number:	
Confirmation Number:	1285
Title of Invention:	Power Control for Battery Powered Personal Area Network Device System and Method
First Named Inventor/Applicant Name:	Eric Christian Hirsch
Customer Number:	133690
Filer:	John Darrell Goodhue/Ashlyn Nguyen
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File Listing:

Document Number	Document Description	File Name	File Size(Bytes)/ Message Digest	Multi Part /.zip	Pages (if appl.)
1	Foreign Reference	WO2014043179A2.pdf	5075239	no	8
			37fb06bb2b37319ff83d17037e71504e185 aaa09		

Warnings: Page 92 of 270

Information:					
2	Foreign Reference	WO2015110577A1.pdf	5235775	no	11
			17df57d10e8dcfd9a403651ce8c2152047969676		
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(71) Applicant:
RESISTANCE TECHNOLOGY, INC.
Arden Hills, MA 55112 (US)

(72) Inventors:
• **Bybee, Thomas D.**
Ramsey, MN 55303 (US)
• **Darbut, Alexander L.**
Fdina, MN 55436 (US)
• **Gorder, Mark S.**
North Oaks, MN 55127 (US)

(74) Representative:
Becker Kurig Straus
Patentanwälte
Bavariastrasse 7
80336 München (DE)

(54) **Hearing aid system**

(57) A hearing aid system includes an earpiece for producing sound representative of a listening environment. A module worn by the hearing aid user is in wireless communication with the earpiece. A plurality of microphones are located in the module to receive incoming sound signals from the listening environment. Processing circuitry in the module analyzes the incoming sound signals received by the plurality of microphones and generates control signals to govern the production of sound by the earpiece.

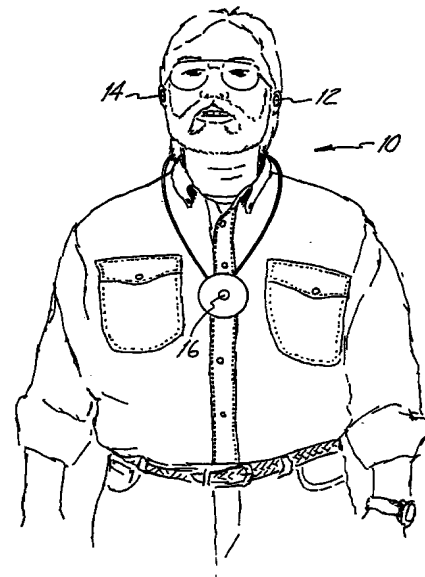


Fig. 1

Description

BACKGROUND OF THE INVENTION

[0001] The present invention relates to a hearing aid system, and more particularly to a personal hearing aid and information system that employs beamforming and other processing techniques to optimize the performance of the hearing aid system in a variety of sound environments.

[0002] Hearing aids have become a popular and effective tool for enabling a person with a hearing deficiency to detect and recognize audible sounds by filtering and amplifying the sounds and reproducing them in a microphone worn in the ear of the user. Hearing aid devices have become more and more sophisticated, and binaural hearing aid systems have been developed so that a user wearing a hearing aid in each ear may identify the direction from which a sound originated based on differences in the time of arrival of a sound at each ear and differences in loudness level between the ears.

[0003] Despite the improvements in hearing aid technology and hearing aid system processing, existing hearing aid systems are still unable to approximate the selective listening patterns that are generated by the human brain in response to particular sound environments. Specifically, hearing aid systems are typically unable to effectively "focus" the attention of the listener onto a particular sound source where other sounds are also present. There is a continuing need in the art for a complete hearing aid system providing improved ability to discriminate among sound levels and sources.

BRIEF SUMMARY OF THE INVENTION

[0004] The present invention is a hearing aid system that includes at least one earpiece and a module in wireless communication with the earpiece. A plurality of microphones are located in the module to receive incoming sound signals from a listening environment. Processing circuitry in the module analyzes the incoming sounds signals received by the microphones and generates control signals that direct the earpiece to produce sounds representative of the listening environment. The processing and analysis amplify sound signals originating from desired directions and attenuate sound signals originating from undesired directions, resulting in superior listening performance.

BRIEF DESCRIPTION OF THE DRAWINGS

[0005]

FIG. 1 is a diagram illustrating a human outfitted with a hearing aid system according to the present invention

FIG. 2 is a diagram illustrating the components of a

hearing aid system according to a first embodiment of the present invention.

FIG. 3 is a diagram illustrating the components of a hearing aid system according to a second embodiment of the present invention.

FIG. 4 is a block diagram illustrating the functional components of a medallion utilized in the hearing aid system of the present invention.

FIG. 5 is a block diagram illustrating the functional components of an earpiece utilized in the hearing aid system of the present invention.

FIG. 6 is a diagram illustrating a simplistic example of a multi-element sensor array for receiving incoming sound signals.

FIG. 7 is a stacked graph illustrating a beamforming example where the left and right sensor signals are in phase.

FIG. 8 is a stacked graph illustrating a beamforming example where the left and right sensor signals are 180 degrees out of phase.

FIG. 9 is a stacked graph illustrating a beamforming example where the left and right sensor signals are less than 180 degrees out of phase.

FIG. 10 is a graph illustrating the response of a hearing aid system employing two omni-directional microphones 5.25 inches apart where incoming sound signals have a frequency of 1275 Hz.

FIG. 11 is a graph illustrating the response of a hearing aid system employing two omni-directional microphones 5.25 inches apart where incoming sound signals have a frequency of 1000 Hz.

FIG. 12 is a graph illustrating the response of a hearing aid system employing two omni-directional microphones 5.25 inches apart where incoming sound signals have a frequency of 1500 Hz.

FIG. 13 is a graph illustrating the response of a hearing aid system employing two directional microphones 5.25 inches apart where incoming sound signals have a frequency of 1275 Hz.

FIG. 14 is a diagram illustrating an exemplary beam pattern exhibited by a microphone array and beamformer according to an embodiment of the present invention.

FIG. 15 is a diagram illustrating the exemplary beam pattern shown in FIG. 14 in relation to a first exemplary sound environment.

FIG. 16A is a graph illustrating an uncorrupted input signal from the speaker shown in FIG. 15 to be listened to with the hearing aid system of the present invention.

FIG. 16B is a graph illustrating the input signal of FIG. 16A corrupted with random noise.

FIG. 16C is a graph illustrating the beamformer output of the hearing aid system of the present invention.

FIG. 17 is a diagram illustrating the exemplary beam pattern shown in FIG. 14 in relation to a second exemplary sound environment.

FIG. 18A is a graph illustrating an uncorrupted input signal from the speaker shown in FIG. 17 to be listened to with the hearing aid system of the present invention.

FIG. 18B is a graph illustrating the input signal of FIG. 18A corrupted with directional noise, random noise and reverberation.

FIG. 18C is a graph illustrating the beamformer output of the hearing aid system of the present invention.

DETAILED DESCRIPTION

[0006] FIG. 1 is a diagram illustrating a human equipped with a hearing aid system 10 according to the present invention. Hearing aid system 10 includes left earpiece 12, right earpiece 14 and medallion 16 worn round the user's neck or clipped onto the user's shirt, for example. As will become apparent in the detailed description of hearing aid system 10 to follow, earpieces 12 and 14 and medallion 16 are equipped with microphones, wireless transceivers, processing circuitry, or a combination of these components, enabling hearing aid system 10 to provide performance above and beyond the performance of the individual earpieces or medallion.

[0007] FIG. 2 is a diagram illustrating the configuration of a first embodiment of hearing aid system 10a. Left earpiece 12 includes FM receiver 22, and right earpiece 14 includes FM receiver 24. Medallion 16 includes microphones 26, 28 and 30 and FM transmitter 32. FM transmitter 32 is operable to wirelessly transmit signals and data to FM receiver 22 of left earpiece 12 via wireless link 24, and to FM receiver 24 of right earpiece 14 via wireless link 36.

[0008] In an exemplary mode of operation, microphones 26, 28 and 30 operate to receive incoming sound signals from the environment around the hearing aid system user. Medallion 16 includes processing means (not shown in FIG. 2) to interpret the incoming sound signals received by microphones 26, 28 and 30 and generate appropriate control signals for reproducing sounds in the ears of the user at earpieces 12 and 14. The control signals are transmitted from medallion 16 via FM transmitter 32 along wireless links 34 and 36 to FM receivers 22 and 24 in earpieces 12 and 14. Earpieces 12 and 14 are operable in response to the control signals to reproduce the appropriate sounds in the ears of the user.

[0009] FIG. 3 is a diagram illustrating the configuration of a second embodiment of hearing aid system 10b. Left earpiece 12 includes FM transceiver 22 and microphone 23. Right earpiece 14 includes FM transceiver 24 and microphone 25. Medallion 16 includes microphones 26, 28 and 30 and FM transceiver 32. FM transceivers 22, 24 and 32 are operable to wirelessly transmit signals and data between left earpiece 12, right earpiece 14 and medallion 16 on wireless links 34 and 36.

[0010] In an exemplary mode of operation, microphones 23 and 25 in earpieces 12 and 14, respectively, and microphones 26, 28 and 30 in medallion 16 operate to receive incoming sound signals from the environment around the hearing aid system user. Data representing the sound signals received by microphone 23 in left earpiece 12 and microphone 25 in right earpiece 14 is sent from FM transceiver 22 on wireless link 34 and from FM transceiver 24 on wireless link 36 to FM transceiver 32 in medallion 16. Medallion 16 includes processing means (not shown in FIG. 3) to interpret the incoming sound signals received by microphones 26, 28 and 30 and the data signal received from earpieces 12 and 14 by FM transceiver 32. The processing means generates appropriate control signals for reproducing sounds in the ears of the user at earpieces 12 and 14. The control signals are transmitted from medallion 16 via FM transceiver 32 along wireless links 34 and 36 to FM transceivers 22 and 24 in earpieces 12 and 14. Earpieces 12 and 14 are operable in response to the control signals to reproduce the appropriate sounds in the ears of the user.

[0011] FIG. 4 is a block diagram illustrating the functional components of medallion 16 utilized in hearing aid system 10 of the present invention. In an exemplary embodiment, medallion 16 houses the main processing circuitry of hearing aid system 10, in addition to an array of microphones and an FM transceiver. Microphones 26, 28, 30 and 31 are spatially arranged on medallion 16 to optimize the ability of the microphones to distinguish the direction from which an incoming sound originates. The details of this spatial arrangement may vary; a simplistic example showing the effects of different spatial arrangements is discussed below with respect to FIGS. 6-13. Any number of microphones may be provided in medallion 16, as schematically demonstrated in FIG. 4. The signals received by microphones 26, 28, 30 and 31 are amplified by amplifiers 46, 48, 50 and 51, respectively. The outputs of amplifiers 46, 48, 50 and 51 are coupled to analog multiplexer and analog-to-digital (A/D) converter 52. Analog multiplexer and A/D converter 52 converts the analog signals from amplifiers 46, 48, 50, 51 into digital representations of those signals and sequences the signals into a digital data packet for input to digital signal processor (DSP) 54. In an embodiment such as hearing aid system 10b shown in FIG. 3, signals from remote microphones in earpieces worn by the user are transmitted on wireless links 34 and 36 to FM transceiver 32 in medallion 16. These signals are converted into digital form by FM radio receiver 58 and coupled as input to DSP 54.

[0012] DSP 54 implements a numerical algorithm to process the signals received from analog multiplexer and A/D converter 52 and FM radio receiver 58 in a predetermined manner. Given a desired processing scheme for the input signals, it is within the expertise of one skilled in the art to configure the DSP 54 to imple-

ment the appropriate numerical algorithm to achieve the desired processing scheme. The objectives of such processing schemes are described below with respect to FIGS. 7-13. Executing the algorithm produces control signals for generating appropriate signals in the earpieces worn by the user. The control signals are output from DSP 54 to FM radio transmitter 56 for wireless transmission via FM transceiver 32 on wireless links 34 and 36 to the respective earpieces.

[0013] FIG. 5 is a block diagram illustrating the functional components of earpiece 12 (or 14) utilized in hearing aid system 10 of the present invention. Incoming sound signals are received by directional microphone 23a and omni-directional microphone 23b. In an alternative embodiment, only one of directional microphone 23a and omni-directional microphone 23b is provided in earpiece 12. The signals received by microphones 23a and 23b are amplified by amplifiers 66 and 68, respectively, which are in turn coupled to analog multiplexer and analog-to-digital (A/D) converter 70. Signals from remote microphones in a medallion worn by the user are transmitted on wireless link 34 to FM transceiver 22. These signals are converted into digital form by FM radio receiver 74 and coupled as input to DSP 72.

[0014] As with DSP 54 shown in FIG. 4, DSP 72 implements a numerical algorithm to process the signals received from analog multiplexer and A/D converter 70 and FM radio receiver 74 in a predetermined manner. Executing the algorithm produces control signals for generating appropriate signals in the earpieces worn by the user. The control signals are output from DSP 72 directly to receiver 78 in earpiece 12, and also to FM radio transmitter 76 for wireless transmission via FM transceiver 22 on wireless link 34 to the medallion worn by the user, where the signal will be relayed to the other earpiece worn by the user.

[0015] In the embodiment schematically pictured in FIG. 5, DSP 72 is shown as being located in earpiece 12. In this embodiment, DSP's may be employed in the earpieces only, with a medallion worn by the user serving as an additional location for microphones in the microphone array and as an FM relay station for signals to be transmitted between earpieces. Alternatively, an additional DSP may also be located in the medallion, to distribute the processing functions between the physical components of the hearing aid system, or for redundancy purposes. In another embodiment, a DSP may only be located in the medallion (as shown in FIG. 4), with no DSP in the earpieces. Other arrangements of functional components within the physical parts of the hearing aid system are contemplated by the present invention.

[0016] With the components provided as shown in FIGS. 1-5, the hearing aid system of the present invention is able to achieve high performance operation and listening features that were not possible with prior art hearing aids. To understand the performance advan-

tages enabled by the present invention, a simplified description of a multi-sensor processing technique called beamforming is beneficial. Beamforming is a technique that works by combining the signals received by an array of sensor elements, such as microphones, to generate a desired composite response. For example, a hearing aid system beamformer boosts the signal arriving from some directions and attenuates signals arriving from other directions, to enable the hearing aid system user to "focus" attention on a particular sound source. The direction of maximum response, referred to as the maximum response axis (MRA), can be steered in different directions by properly combining the signals from each sensor element.

[0017] FIG. 6 depicts a simple example where multiple sensor elements are positioned in a straight line. The angle perpendicular to a line that passes through the elements is defined as the "boresight" angle, or zero degrees. The physical angle of incident sound is therefore defined within a range of -180 to +180 degrees, where 0 degrees is boresight, ± 180 degrees is straight behind, +90 degrees is to the right, and -90 degrees is to the left. This simple example is illustrated in FIG. 6, where microphones 80, 82 and 84 are linearly aligned at a distance d apart and an incoming sound signal having wavelength λ creates an angle θ with the microphone line. The difference in time of the sound signals received by adjacent microphones in the array is defined by:

$$x = \frac{360 \cdot d \cdot \sin \theta}{\lambda} \text{ degrees of phase or}$$

$$\frac{d \cdot \sin \theta}{c} \text{ seconds,}$$

where c is the speed of the waves. This difference in time may be utilized to determine the direction from which sound signals are originating.

[0018] In one scenario, the objective is to maximize the response of the system along the boresight axis and minimize the response in all other directions. This is a simple processing scenario - the signals from the sensors need only be added together with equal weight given to the signals from each sensor. The results of this scheme are simplistically shown in FIGS. 7-9, where it is assumed that there are only two sensor elements for illustration purposes. FIG. 7 illustrates that where the incoming sound signals are in phase with each other (that is, the sound signals reach the two sensors at the same time, meaning that their origination direction is "boresight"), and the signals received by the sensors are as illustrated by curves 90 and 92, adding the signals will result in curve 94 having the sum of the amplitudes of curves 90 and 92. FIG. 8 illustrates that where the incoming sound signals are 180 degrees out of phase (that is, the sound signals reach the sensors at

times separated by a half cycle), and the signals received by the sensors are as illustrated by curves 100 and 102, adding the signals will result in a zero signal 104 - the signals completely cancel. This will occur when the sound signals are coming from an angle that is ± 90 degrees from boresight. FIG. 9 illustrates that where the incoming sound signals are somewhat out of phase (that is, the sound signals reach the sensors at times separated by less than a half cycle), and the signals received by the sensors are as illustrated by curves 110 and 112, adding the signals will result in curve 114 having an amplitude that is less than the sum of the amplitudes of curves 110 and 112. The angle of arrival of the incoming sound signals can be calculated based on the difference in time of arrival, where the spacing between microphones is known.

[0019] It can be appreciated from the discussion above that the spacing of sensor elements is important to the ability to determine the origination direction of incoming sound signals. The ideal spacing of sensor elements is a half wavelength, so that an incoming sound signal coming from 90 degrees to boresight reaches adjacent sensors at times separated by a half cycle and the signals completely cancel one another. With this spacing, the range of combined signal amplitudes extends from 0 (complete cancellation) to twice the amplitude of the incoming signal, for the two-sensor example, which is the maximum range. Where microphones are spaced more than a half wavelength apart (typically for higher frequencies which have lower wavelengths), spatial aliasing occurs and grating lobes form in the response pattern, which makes accurate determination of the origination of the sound signal more difficult.

[0020] FIGS. 10-13 show the response of the two-microphone array over the full range of sound signal origination angles, with 0 degrees being boresight, -90 degrees being to the left, and +90 degrees being to the right. FIG. 10 illustrates the scenario where the two microphones are omni-directional microphones spaced 5.25 inches apart and the frequency of incoming sound signals is 1275 Hz (at 1275 Hz, 5.25 inches is a half wavelength). Curve 120 shows that the peak response of the system (adding the signals received at the two microphones) is at angles of 0 and ± 180 degrees, with a deep "null" (attenuated response) at an angle of ± 90 degrees. FIG. 11 illustrates the same microphone scenario where the frequency of the incoming sound signals is 1000 Hz - at this frequency, using the same adding formula, curve 130 shows that the nulls at ± 90 degrees are much less definitive. FIG. 12 illustrates the same microphone scenario where the frequency of the incoming sound signals is 1500 Hz - at this frequency, using the same adding formula, curve 140 shows that side lobes are formed at ± 90 degrees, with lower peak amplitudes, and the nulls are shifted to about ± 60 degrees and ± 120 degrees. These curves illustrate the importance of having microphone elements that are a

half wavelength apart; where the microphone spacing is more or less than a half wavelength, the response curves are not as well defined, which tends to result in less ability for the user of a hearing aid system to focus on particular sounds.

[0021] FIG. 13 illustrates an alternative scenario where the microphones utilized in the two-element array are directional microphones, spaced 5.25 inches apart, where the frequency of incoming sound signals is 1275 Hz. Curve 150 shows that the peak response of the system is again at the boresight angle, with a lesser peak at ± 180 degrees, and wide nulls in the vicinity of ± 90 degrees. The use of directional microphones can potentially allow the hearing aid user to more effectively focus on frontal sounds while attenuating sounds originating from the rear.

[0022] FIG. 14 is a diagram illustrating an exemplary beam pattern exhibited by microphone array 200 and an associated beamformer according to an embodiment of the present invention. In the embodiment depicted in FIG. 14, microphone array 200 exhibits a large frontal or main lobe 202, representing sounds coming from the front of a user. Microphone array 200 also exhibits two side lobes 204 and 206 and a back lobe 208. The beam former outputs are such that sounds in main lobe 202 are amplified the most, while sounds in side lobes 204 and 206 are attenuated somewhat and sounds in back lobe 208 are attenuated even more. This beam pattern is designed to allow the user to effectively focus on sounds originating in front of the user (where the user is typically looking), even in an environment where random noise exists to the user's sides and rear. It should be understood that other beam patterns may be formed according to the present invention, and the pattern shown in FIG. 14 is an example of one particular beam pattern that may be implemented when desirable.

[0023] FIG. 15 is a diagram illustrating the exemplary beam pattern shown in FIG. 14 in relation to a first exemplary sound environment. The sound environment includes multiple sources of random noise 210 (such as a crowd of people) at several points around the hearing aid user (wearing microphone array 200), and a keynote speaker 212 in front of the user. As can be seen in FIG. 15, keynote speaker 212 is located at the center of main lobe 202, and sounds originating from speaker 212 will therefore be maximally amplified. Random noise 210 originates from locations at the sides of main lobe 202, and at side lobes 204 and 206 and back lobe 208, and therefore will be attenuated to a level below that of keynote speaker 212.

[0024] FIGS. 16A, 16B and 16C are graphs depicting an uncorrupted sound signal from keynote speaker 212 (FIG. 15), the sound signals received at the left and right input channels of the hearing aid system worn by the user, and the beamformer output from the hearing aid system to the ears of the user. The uncorrupted signal is shown in FIG. 16A. The sound signals received at

the left and right input channels are shown in FIG. 16B. The original input signal (shown in FIG. 16A) is received at each input channel, with a time-shift that is based on the physical distance between the left and right input channel microphones. The left and right channel signals are also corrupted by some level of random noise that persists throughout the listening time frame. The beamformer output is shown in FIG. 16C. The beamformer recognizes the characteristics of the random noise and of the original input signal, and also recognizes, based on the time-shift of the input signal at the left and right channels, which direction the input signal originates from. Since the signal originates from the user's front (see FIG. 15), the signal is amplified to a higher level, while the random noise is attenuated to a lower level, thereby permitting the hearing aid user to better distinguish between the desired sound (keynote speaker 212, FIG. 15) and random noise (noise sources 210, FIG. 15).

[0025] FIG. 17 is a diagram illustrating the exemplary beam pattern shown in FIG. 14 in relation to a second exemplary sound environment. The sound environment includes multiple sources of random noise 210 (such as a crowd of people) at several points around the hearing aid user (wearing microphone array 200), a keynote speaker 212 in front of the user, and a relatively loud directional noise source 214. The sound environment may also include reverberation 216 of the desired noise signal from the walls of the room. As can be seen in FIG. 15, keynote speaker 212 is located at the center of main lobe 202, and sounds originating from speaker 212 will therefore be maximally amplified. Random noise 210, directional noise 214 and reverberation 216 originate from locations at the sides of main lobe 202, and at side lobes 204 and 206 and back lobe 208, and therefore will be attenuated to a level below that of keynote speaker 212.

[0026] FIGS. 18A, 18B and 18C are graphs depicting an uncorrupted sound signal from keynote speaker 212 (FIG. 17), the sound signals received at the left and right input channels of the hearing aid system worn by the user, and the beamformer output from the hearing aid system to the ears of the user. The uncorrupted signal is shown in FIG. 18A. The sound signals received at the left and right input channels are shown in FIG. 18B. The original input signal (shown in FIG. 18A) is received at each input channel, with a time-shift that is based on the physical distance between the left and right input channel microphones. The left and right channel signals are also corrupted by some level of random noise that persists throughout the listening time frame, a higher level of directional noise, and reverberation of the input signal from the walls of the room. The beamformer output is shown in FIG. 18C. The beamformer recognizes the characteristics of the random noise, directional noise, reverberation, and the original input signal, and also recognizes, based on the time-shift of the input signal at the left and right channels, which direction the

input signal originates from. Since the signal originates from the user's front (see FIG. 17), the signal is amplified to a higher level, while the random noise and the directional noise is attenuated to a lower level, thereby permitting the hearing aid user to better distinguish between the desired sound (keynote speaker 212, FIG. 17) and noise (noise sources 210, directional noise source 214, FIG. 17).

[0027] The hearing aid system of the present invention, as shown in FIGS. 1-5, provides an extensive sensor array and processing capability that enables significant flexibility and control of the response of the system to particular sound patterns. The shape of the response curves (shown simplistically in FIGS. 10-13 for a two-microphone example where the signals are merely added together) can be adjusted by performing different numerical algorithms on the signals received by the sensors. This adjustment can involve a technique called "adaptive null steering" which operates to move the nulls in the response pattern to a particular angular location, so that a particular noise source may be somewhat blocked out of the user's hearing, enabling better focus on the desired sound source. The provision of wireless communication links between earpieces and a medallion worn around a user's neck allows a number of spacings between microphones in the array to be utilized to provide the optimum half wavelength spacing to accommodate a higher range of frequencies of incoming sound signals. The hearing aid system therefore is able to provide superior performance compared to prior hearing aid devices, effectively enabling a listener to focus attention on a desired sound source in a variety of listening environments.

[0028] Although the present invention has been described with reference to preferred embodiments, workers skilled in the art will recognize that changes may be made in form and detail without departing from the spirit and scope of the invention.

Claims

1. A hearing aid system comprising:

- an earpiece for producing sound representative of a listening environment;
- a module in wireless communication with the earpiece;
- a plurality of microphones located in the module to receive incoming sound signals from the listening environment;
- processing circuitry in the module for analyzing the incoming sound signals received by the plurality of microphones and generating control signals to govern the production of sound by the earpiece.

2. The hearing aid system of claim 1, further comprising:

- at least one microphone located in the earpiece to receive incoming sound signals from the listening environment.
3. The hearing aid system of claim 2, wherein the at least one microphone located in the earpiece comprises an omni-directional microphone. 5
 4. The hearing aid system of claim 2, wherein the at least one microphone located in the earpiece comprises a directional microphone. 10
 5. The hearing aid system of claim 2, wherein the at least one microphone located in the earpiece comprises an omni-directional microphone and a directional microphone. 15
 6. The hearing aid system of claim 2, wherein the earpiece and the module each include a wireless transceiver for effecting communication between the earpiece and the module. 20
 7. The hearing aid system of claim 1, wherein the earpiece includes a wireless receiver and the module includes a wireless transmitter for transmitting information from the module to the earpiece. 25
 8. The hearing aid system of claim 1, further comprising a second earpiece for producing sound representative of the listening environment, the module being in wireless communication with the second earpiece. 30
 9. The hearing aid system of claim 8, further comprising: 35

at least one microphone located in the first-named and second earpieces to receive incoming sound signals from the listening environment. 40
 10. The hearing aid system of claim 9, wherein the first-named and second earpieces and the module each include a wireless transceiver for effecting communication between the earpieces and the module. 45
 11. The hearing aid system of claim 9, wherein the at least one microphone in the first-named and second earpieces comprises an omni-directional microphone. 50
 12. The hearing aid system of claim 9, wherein the at least one microphone in the first-named and second earpieces comprises a directional microphone. 55
 13. The hearing aid system of claim 9, wherein the at least one microphone in the first-named and second earpieces comprises an omni-directional microphone and a directional microphone.
 14. The hearing aid system of claim 8, wherein the first-named and second earpieces each include a wireless receiver and the module includes a wireless transmitter for transmitting information from the module to the earpieces.
 15. The hearing aid system of claim 1, wherein the processing circuitry comprises a digital signal processor for performing a numerical algorithm on the incoming sound signals received by the microphones to shape a response of the hearing aid system that is represented by the sound produced by the earpiece.
 16. A method of producing sounds in the ears of a user that represent a listening environment, the method comprising:

providing a plurality of microphones in a module worn by the user to receive incoming sound signals from the listening environment;
processing the incoming sound signals received by the microphones to amplify sound signals originating from desired directions and to attenuate sound signals originating from undesired directions;
generating control signals to govern the production of sound in the user's ears according to the result of the processing step; and
communicating the control signals to earpieces located in the user's ears to govern the production of sound therein.
 17. The method of claim 16, further comprising:

providing at least one microphone in the earpieces located in the user's ears to receive incoming sound signals from the listening environment.
 18. The method of claim 16, wherein the processing step comprises:

performing a numerical algorithm on the incoming sound signals received by the microphones to modify the signals according to a predetermined scheme for locating peaks and nulls in the response of the hearing aid system.
 19. The method of claim 16, wherein the communicating step comprises wirelessly transmitting the control signals from the module to the earpieces.

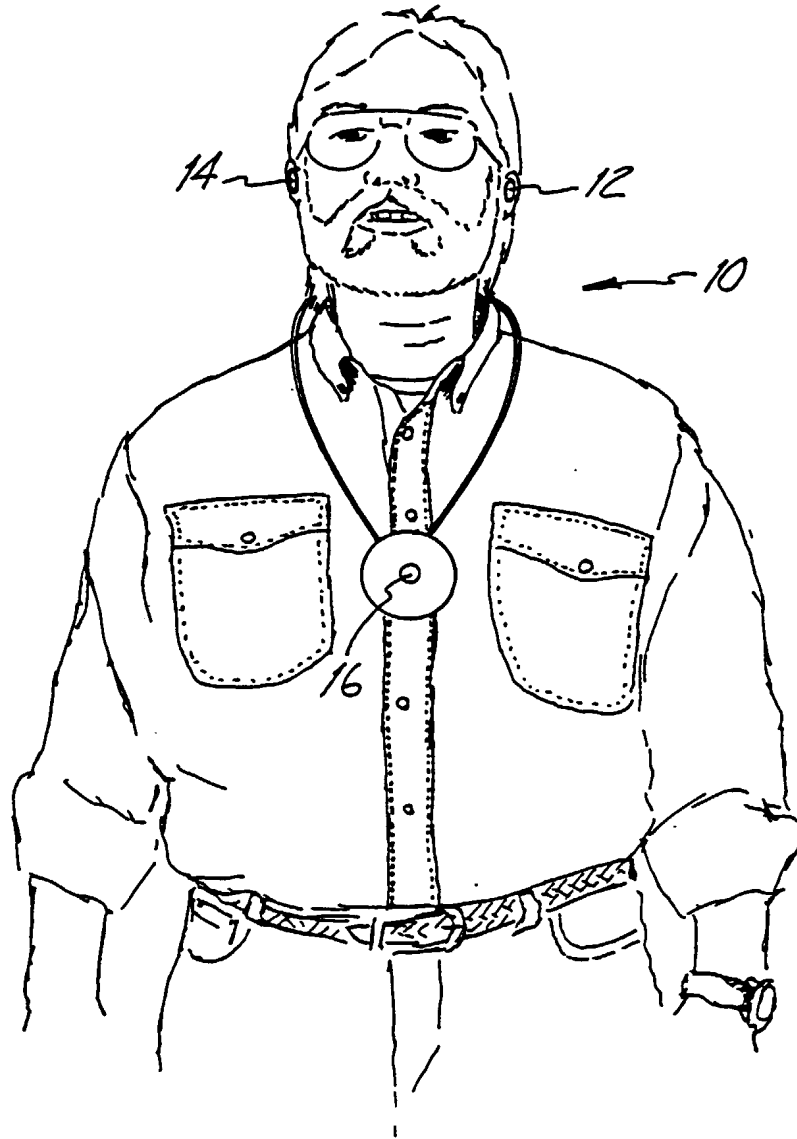
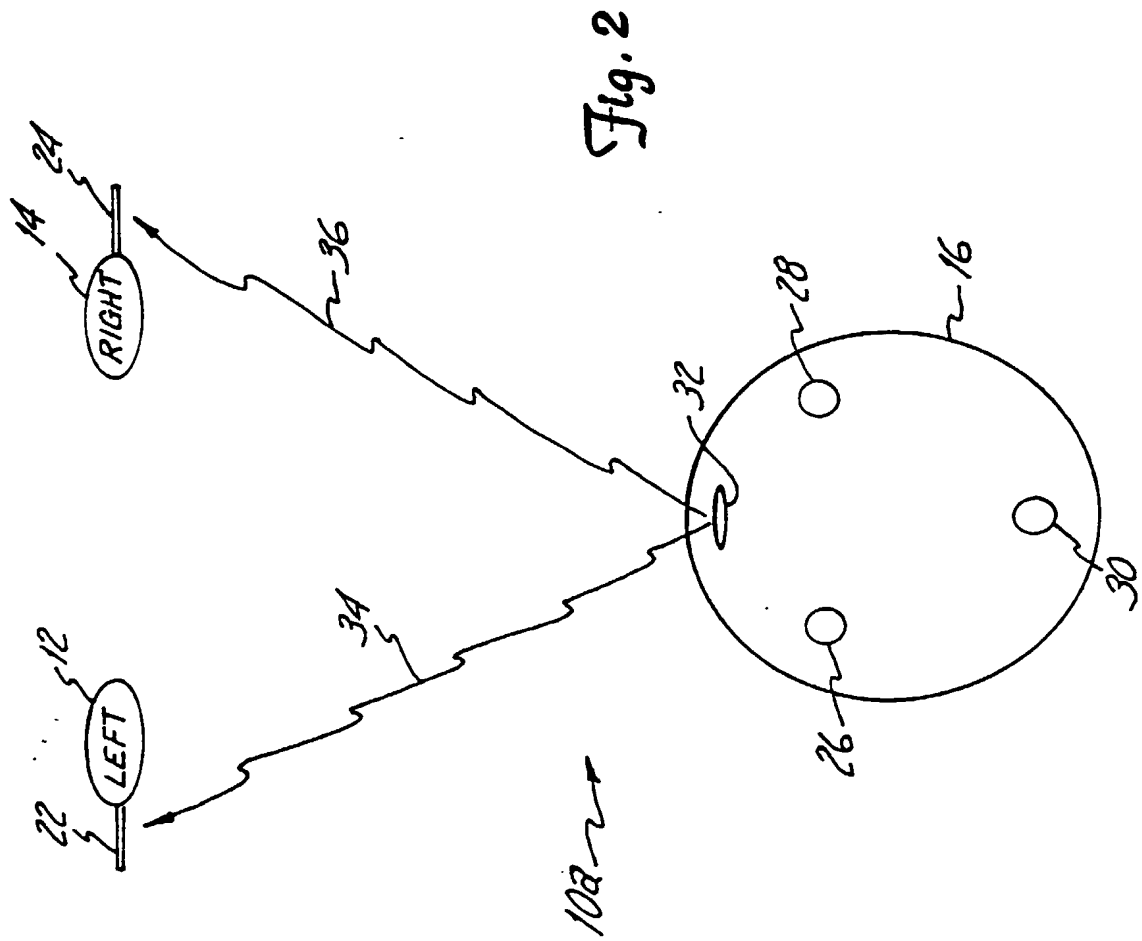
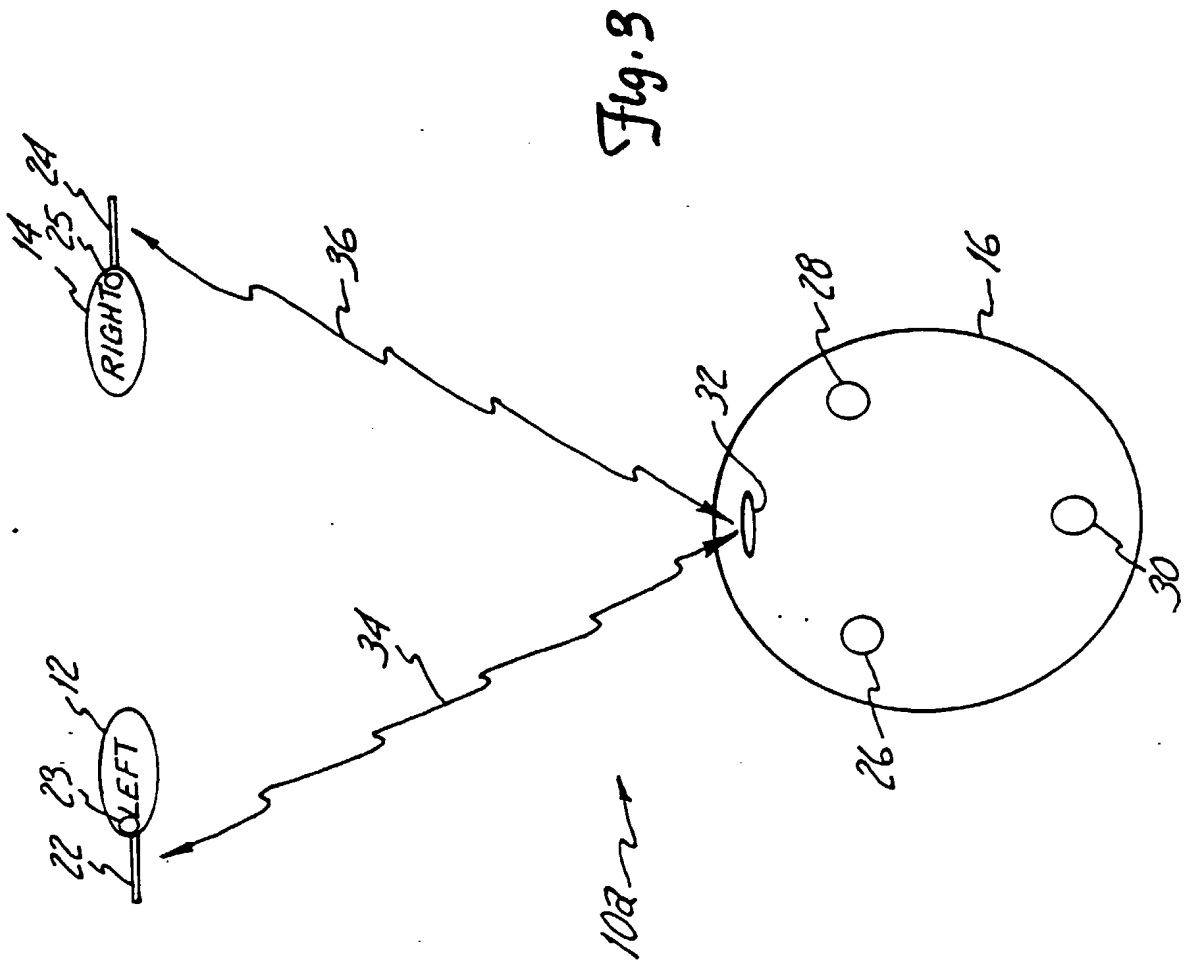


Fig. 1





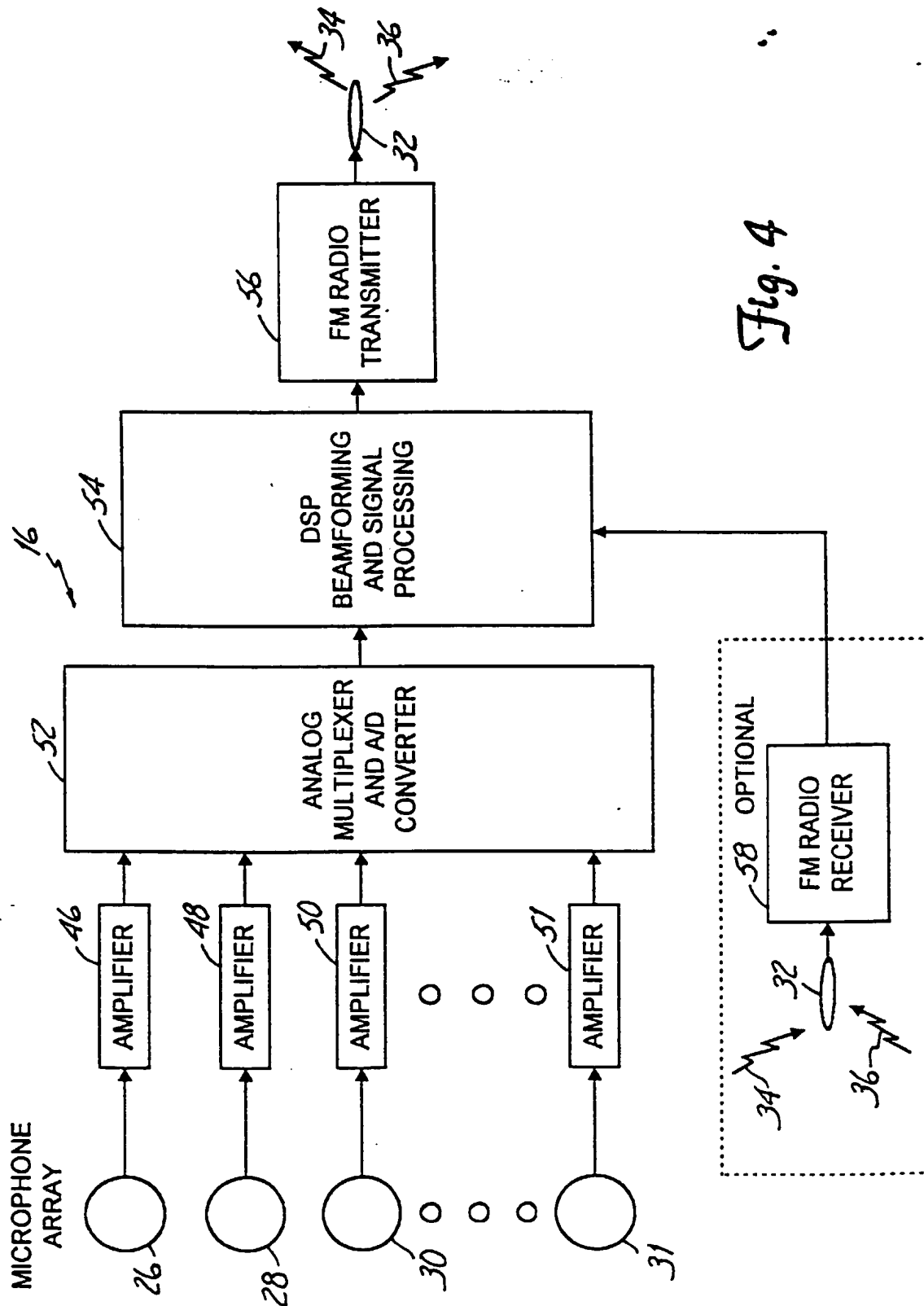
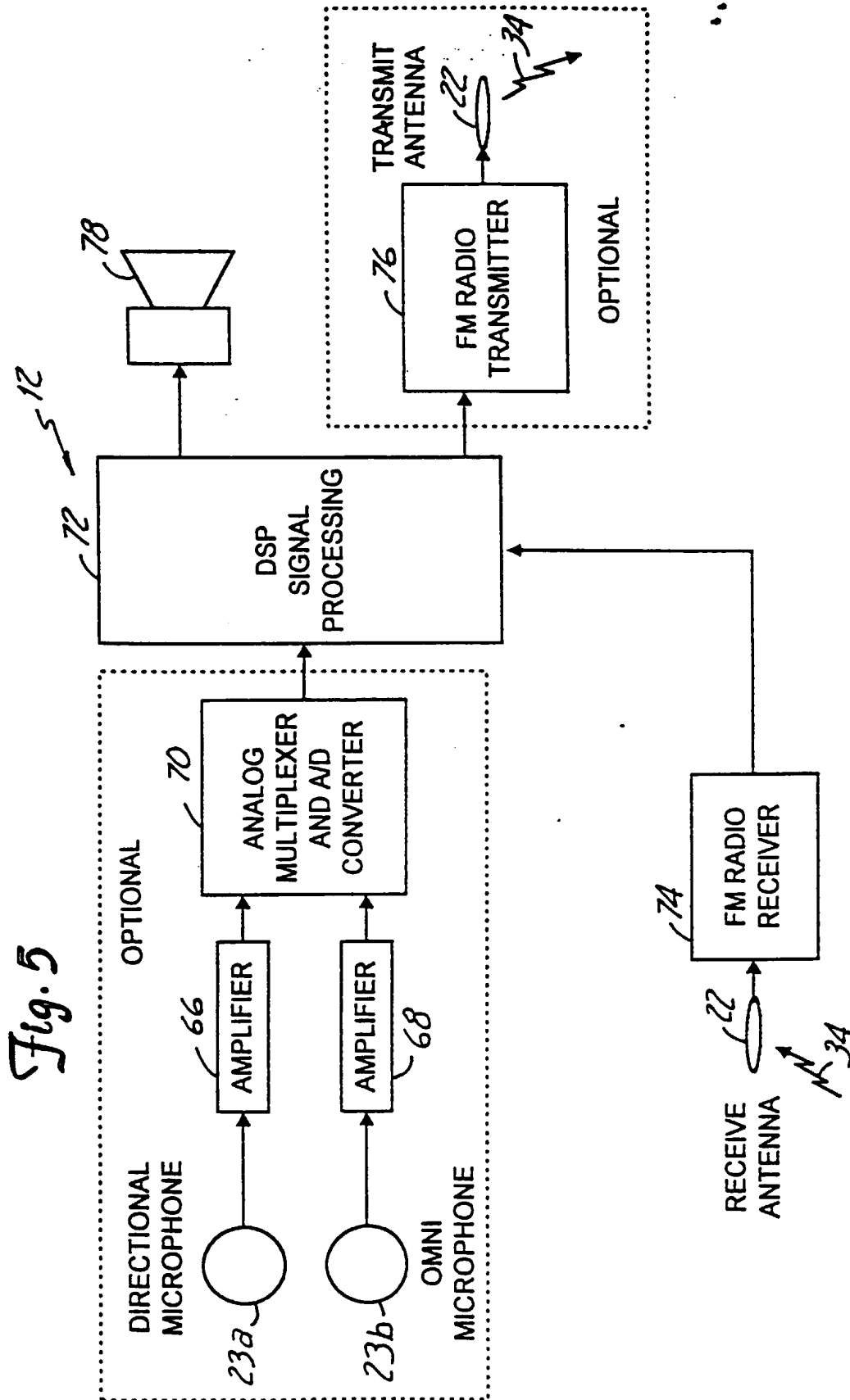


Fig. 4



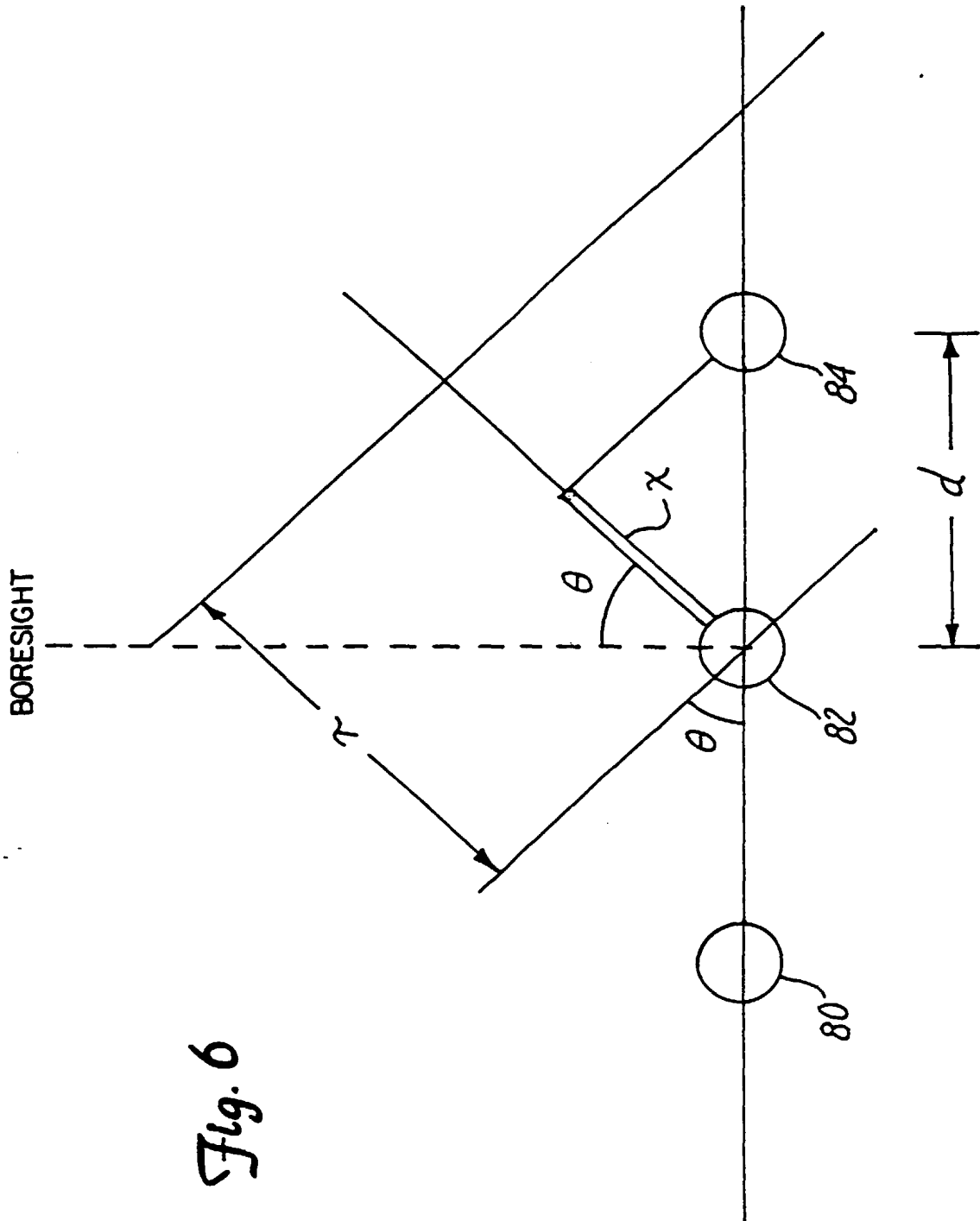


Fig. 6

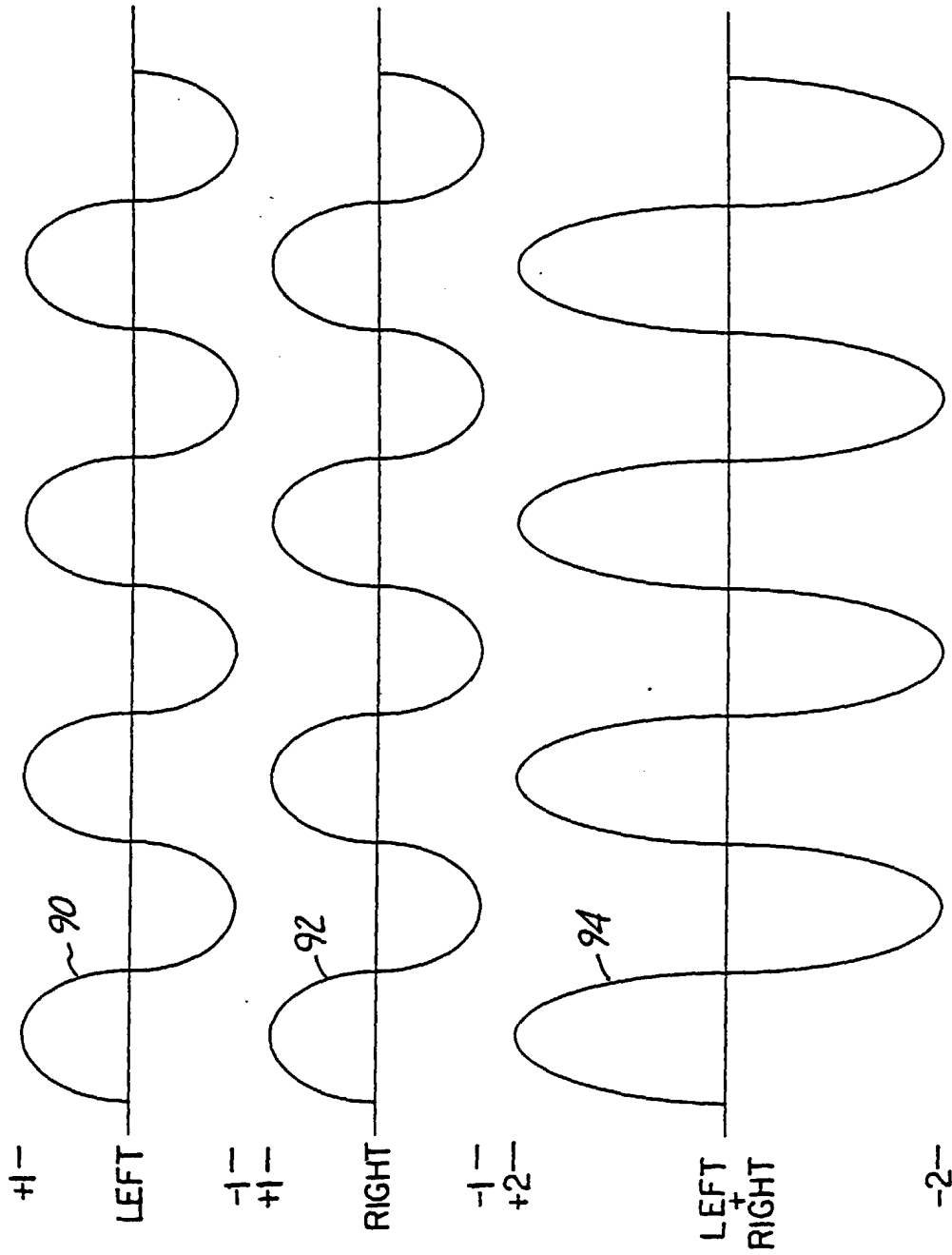


Fig. 7

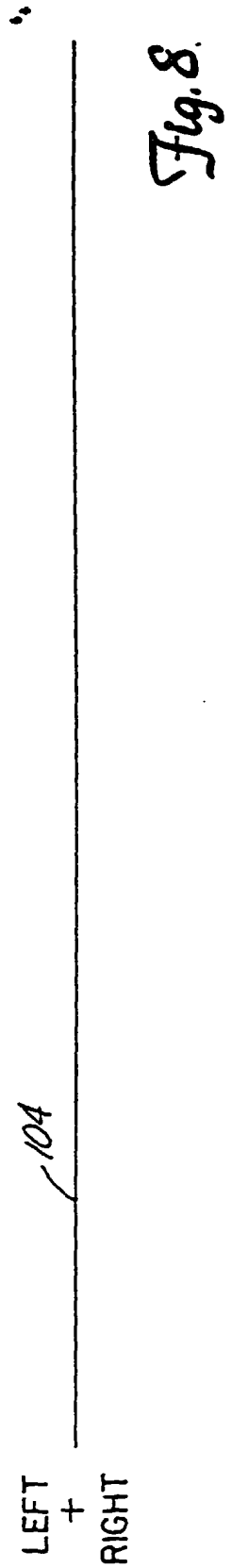
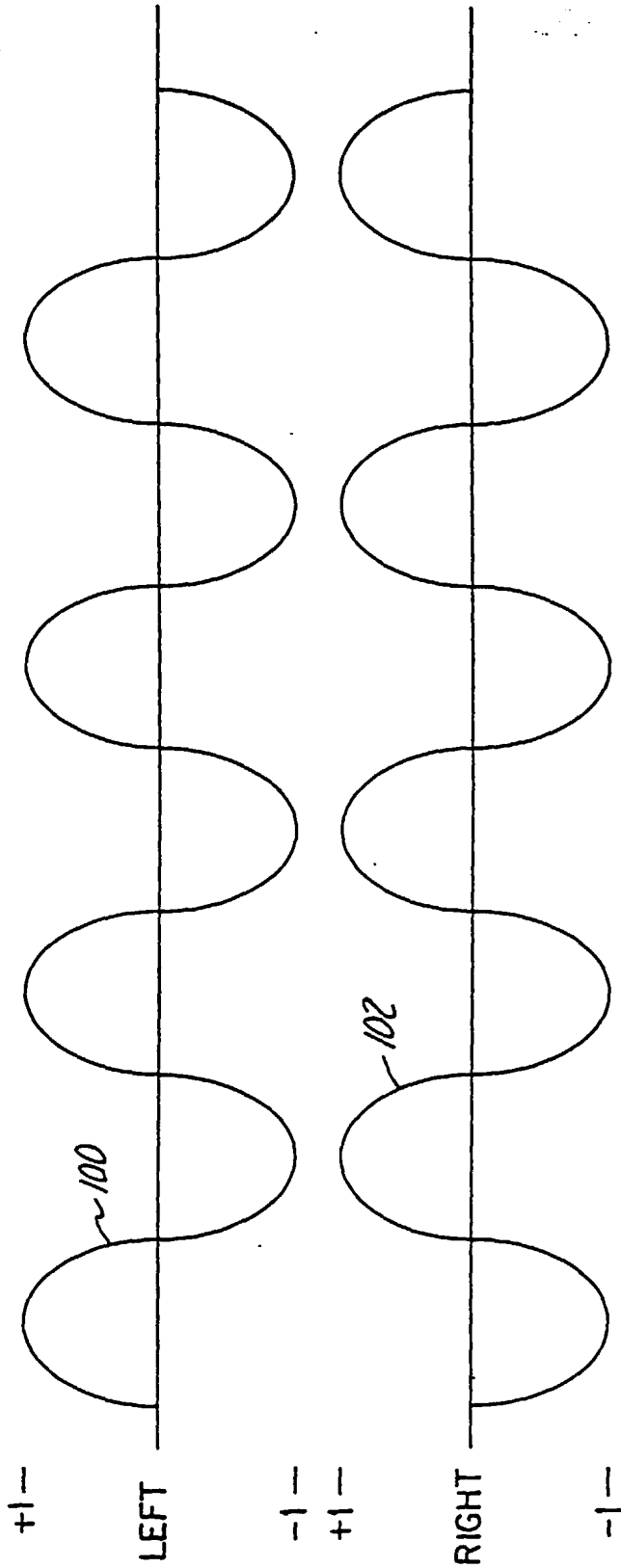


Fig. 8.

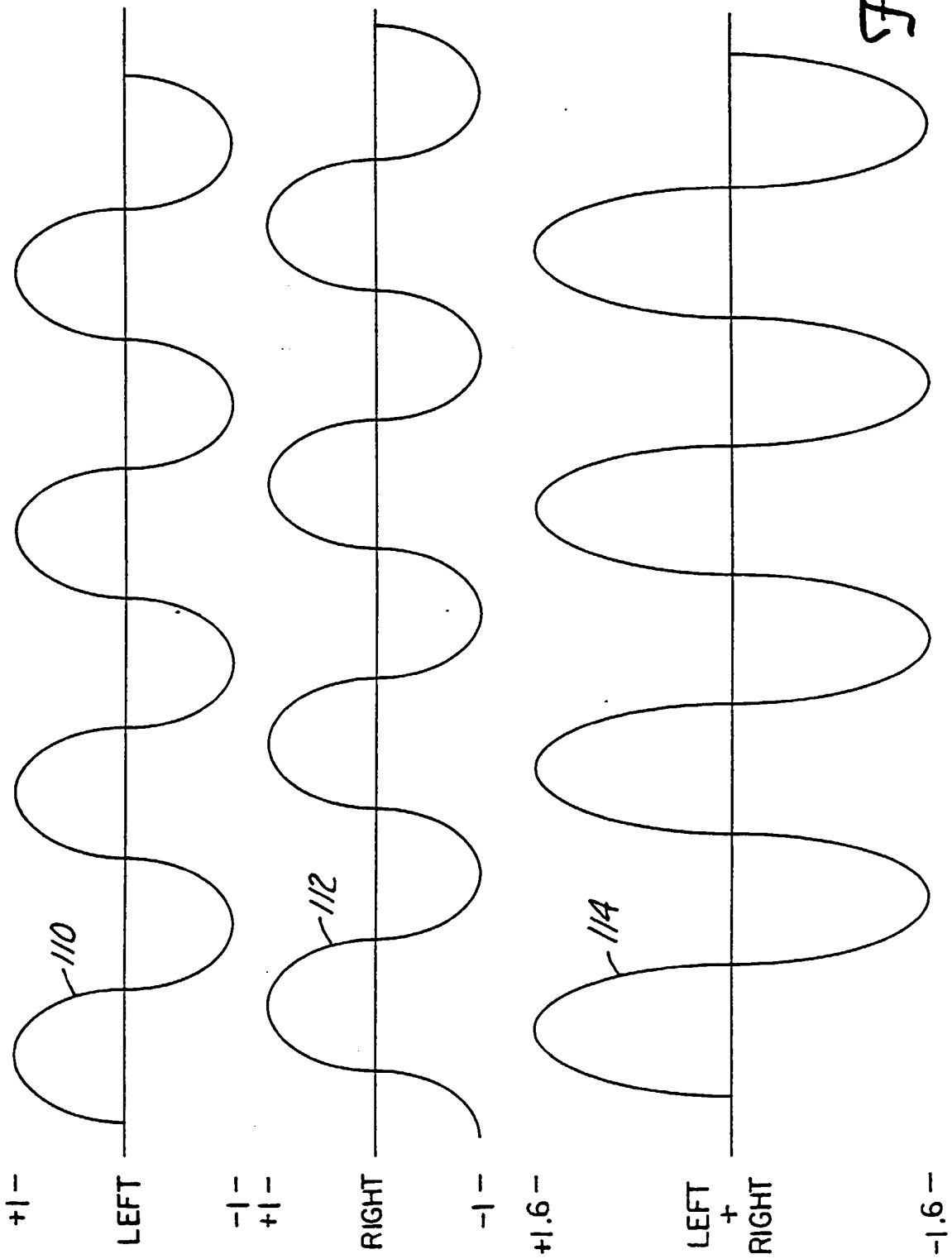


Fig. 9

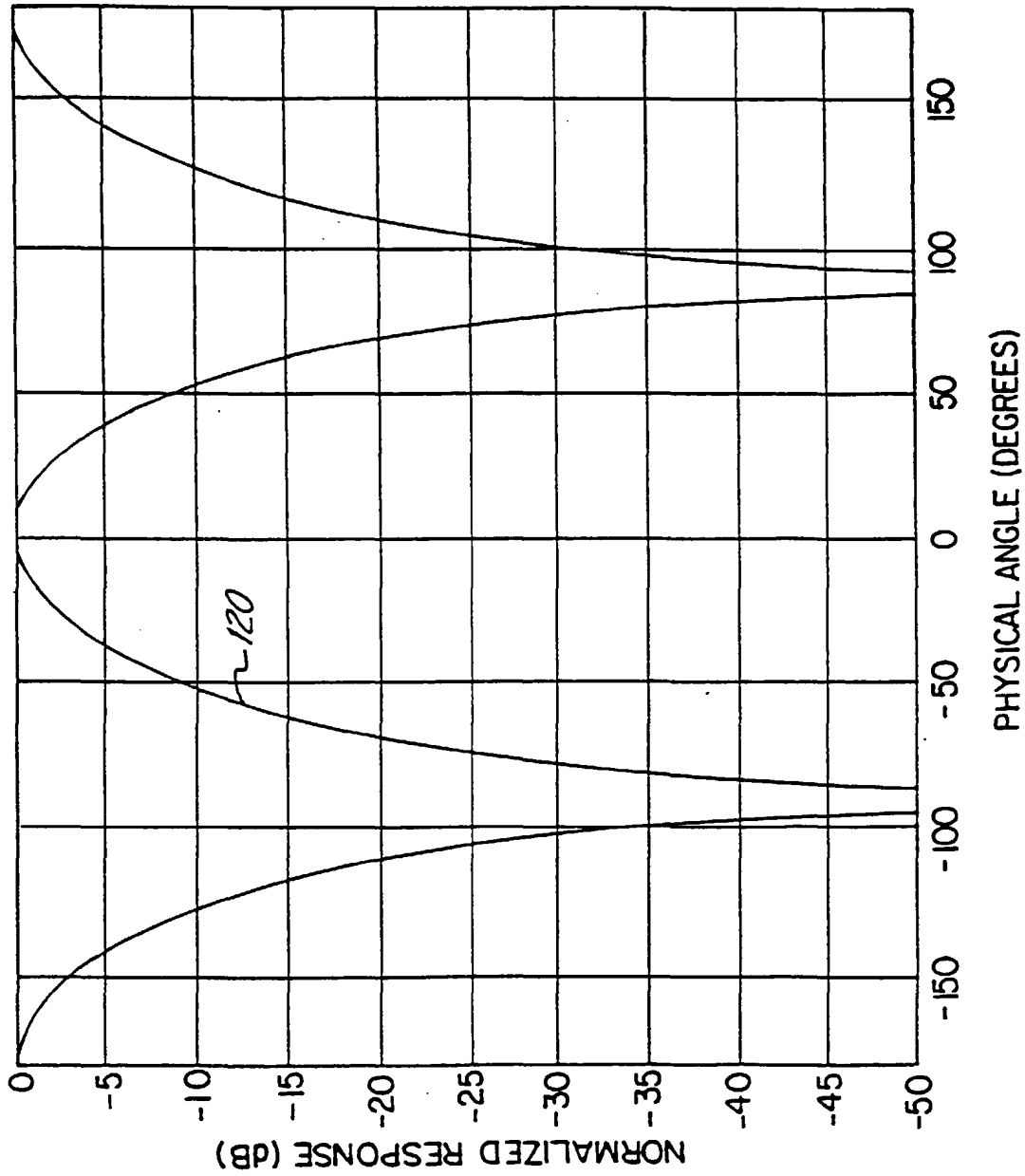


Fig. 10

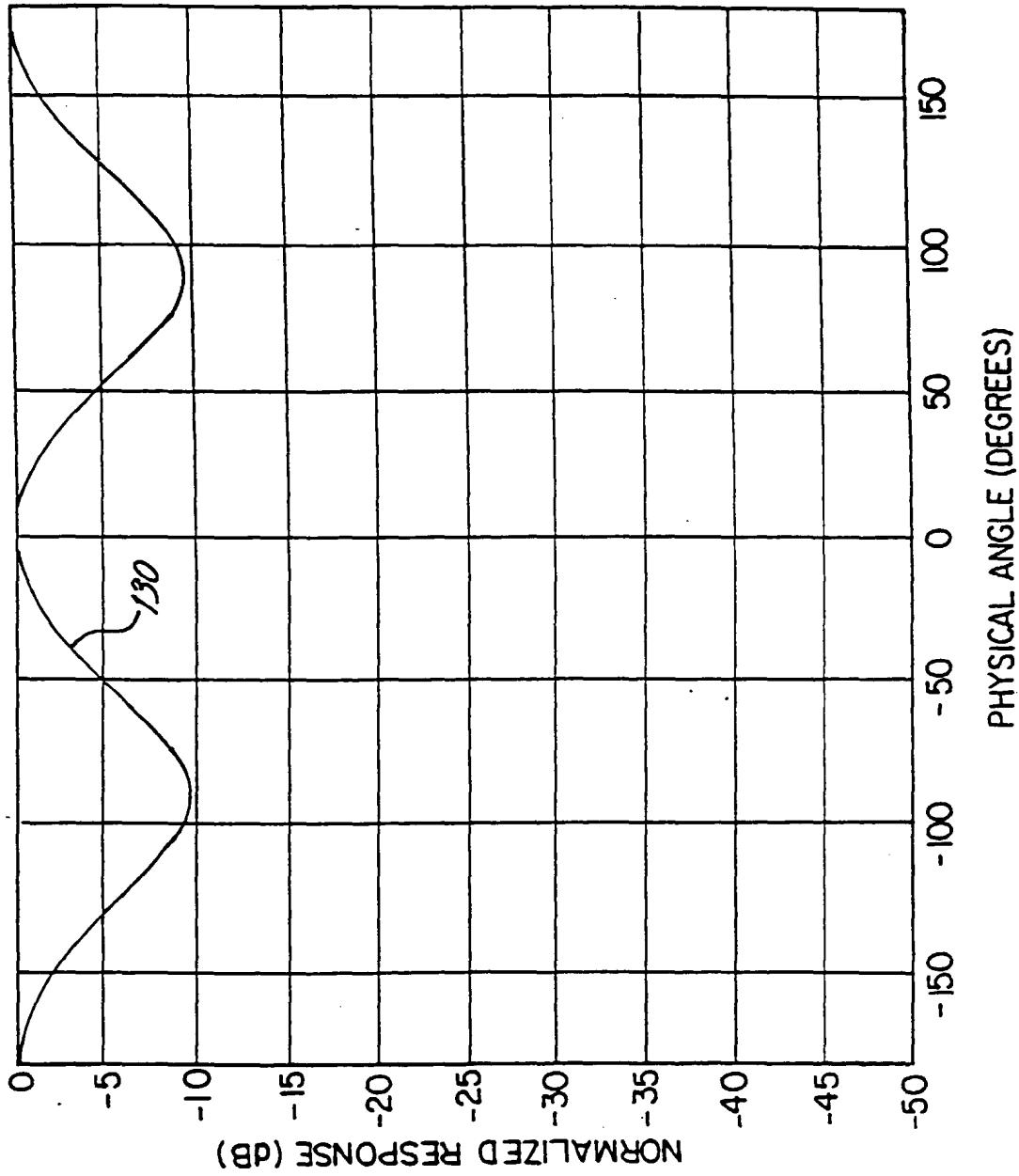


Fig. 11

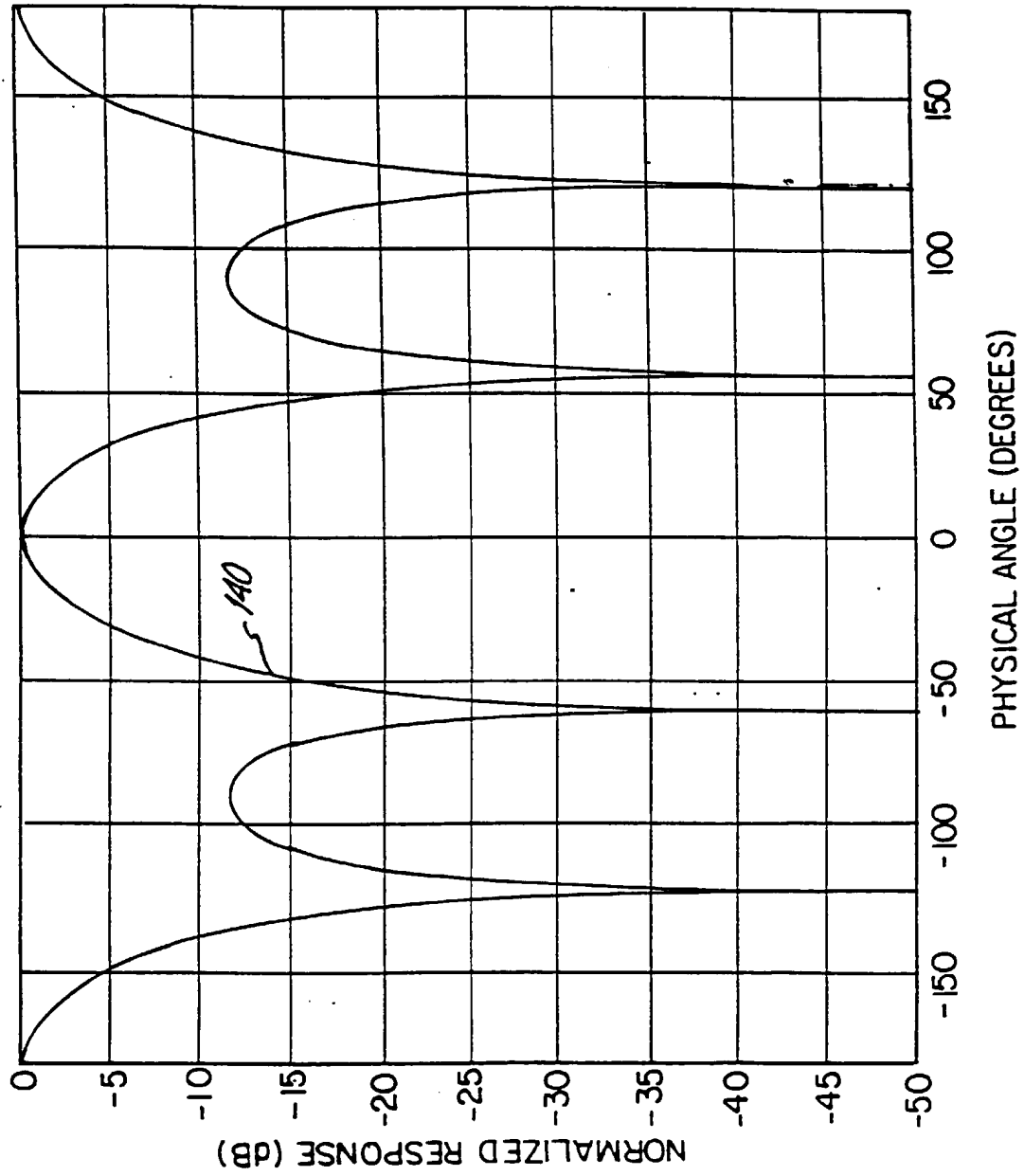


Fig. 12

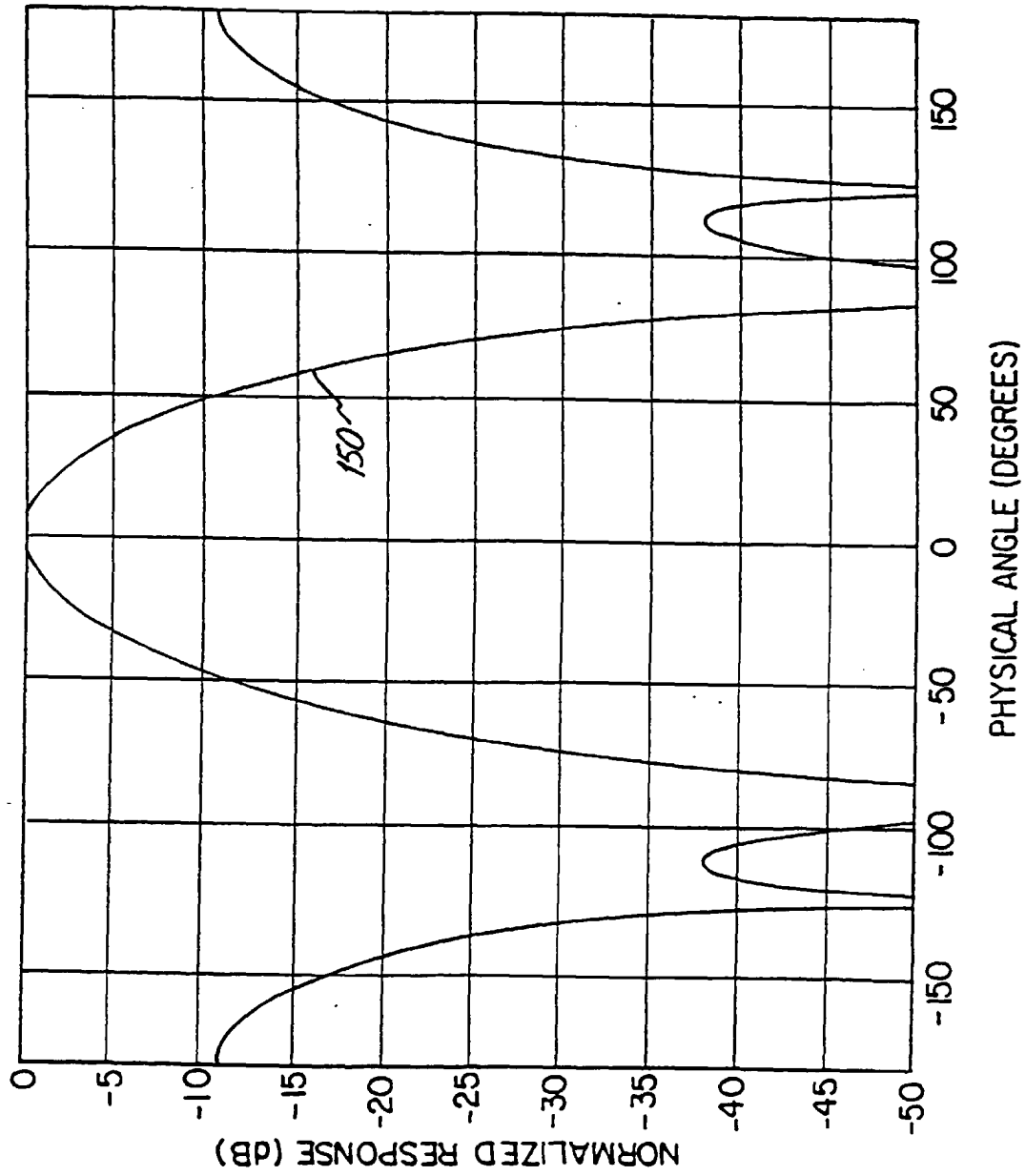


Fig. 13

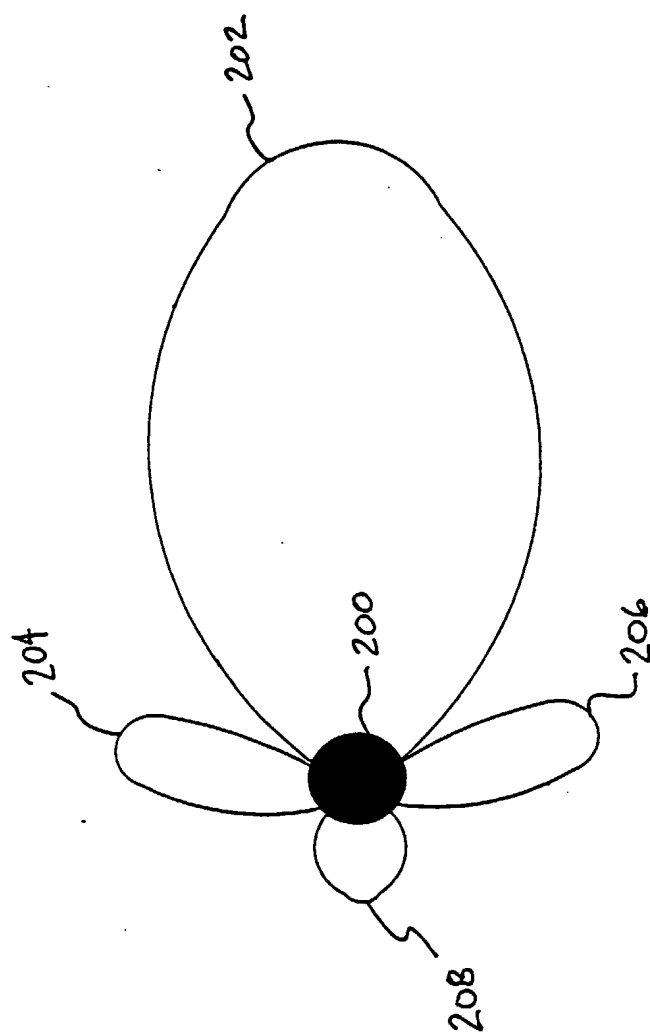
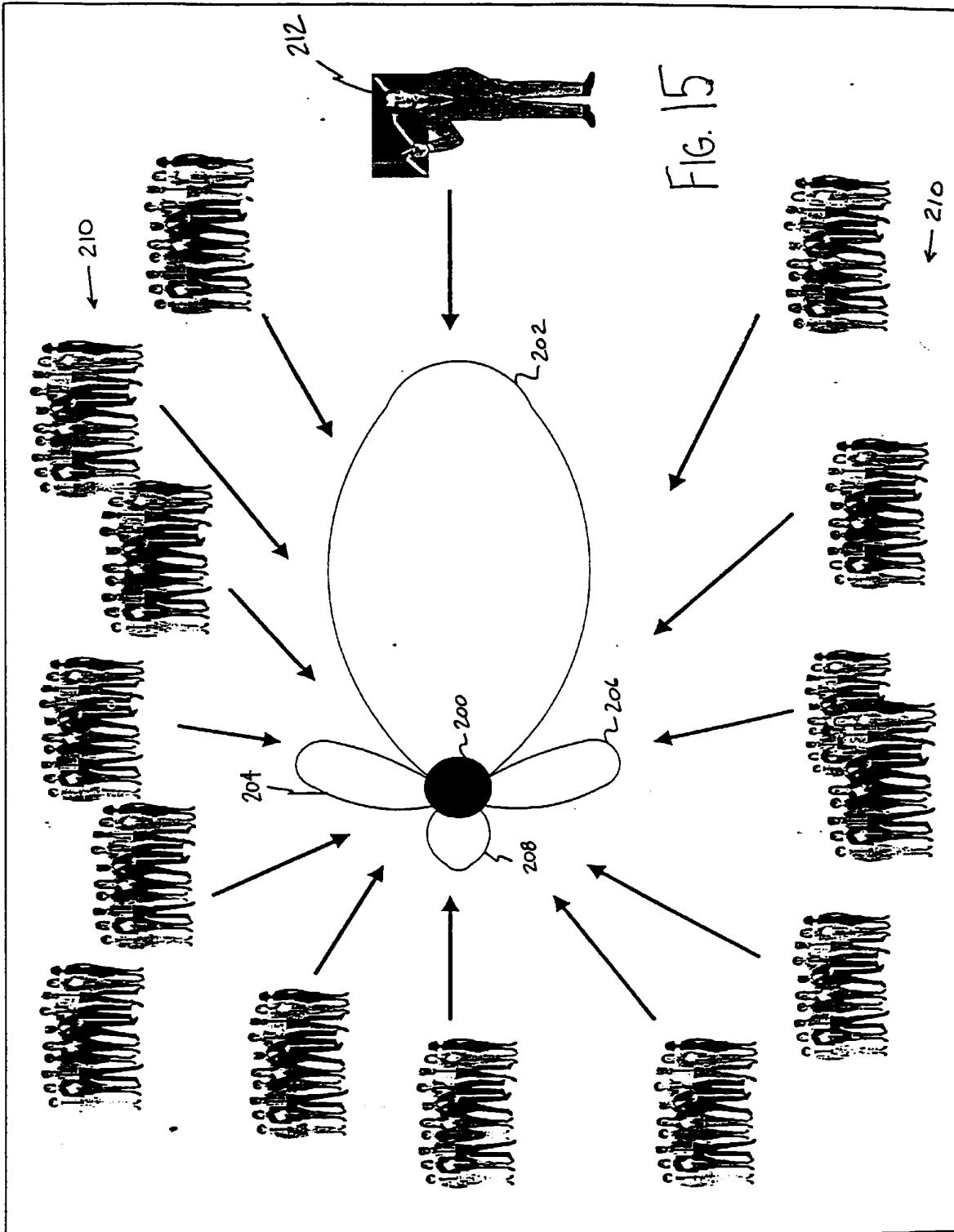


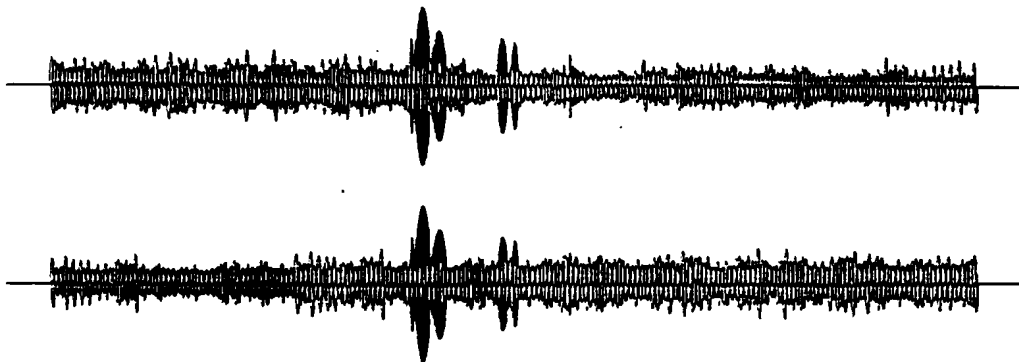
FIG. 14





Uncorrupted Signal

FIG. 16A



Left and Right Input Channels
(corrupted with random noise)

FIG. 16B

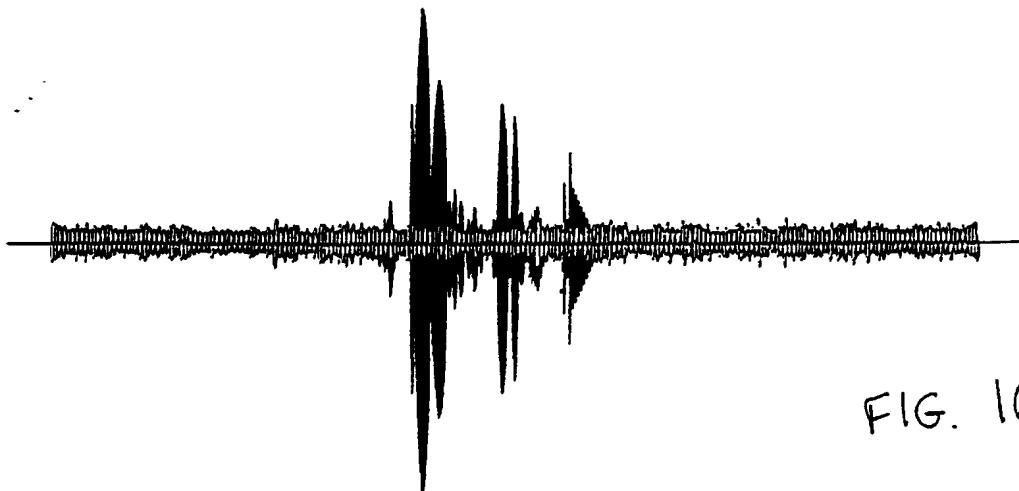
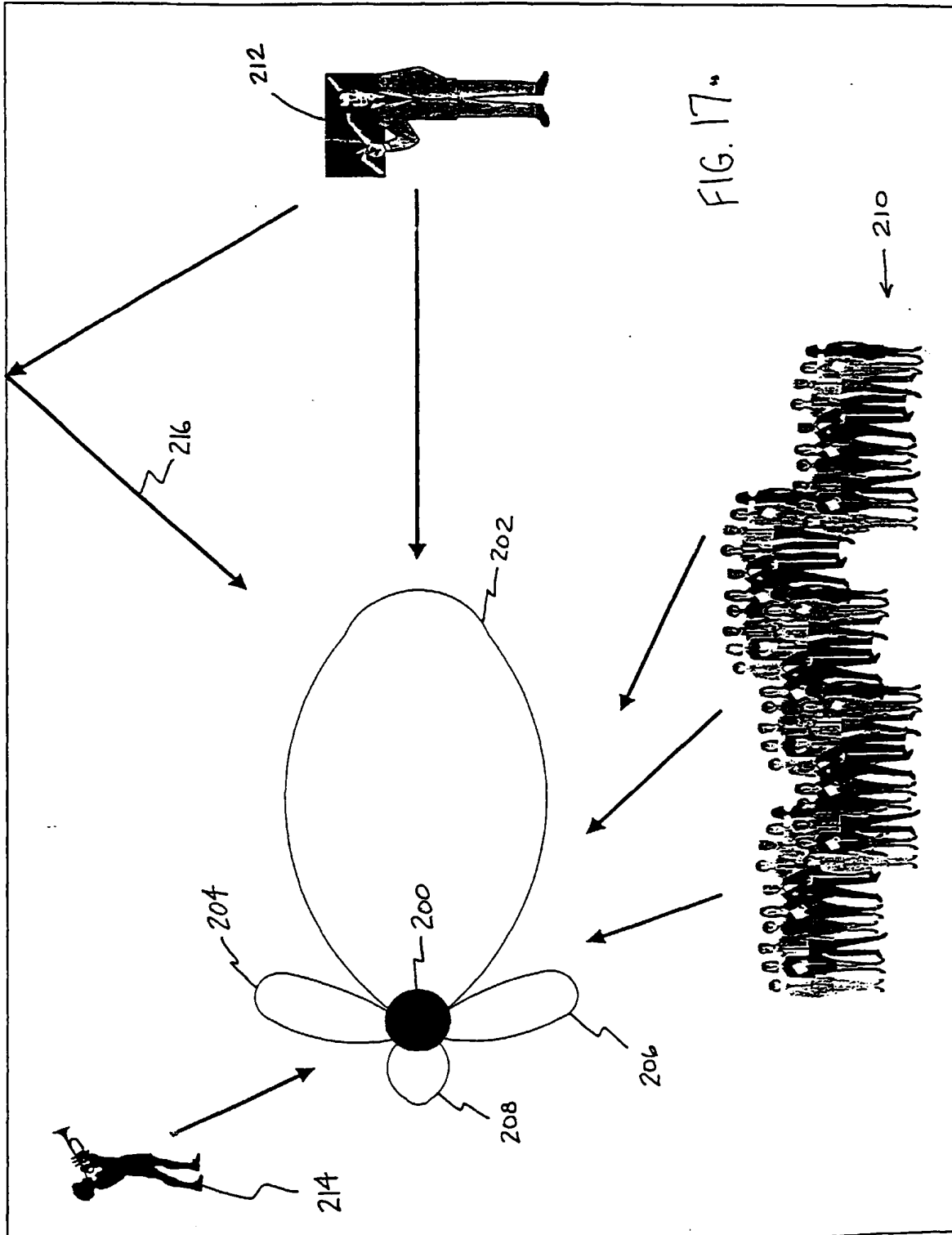


FIG. 16C

Beamformer Output





Uncorrupted Signal

FIG. 18A

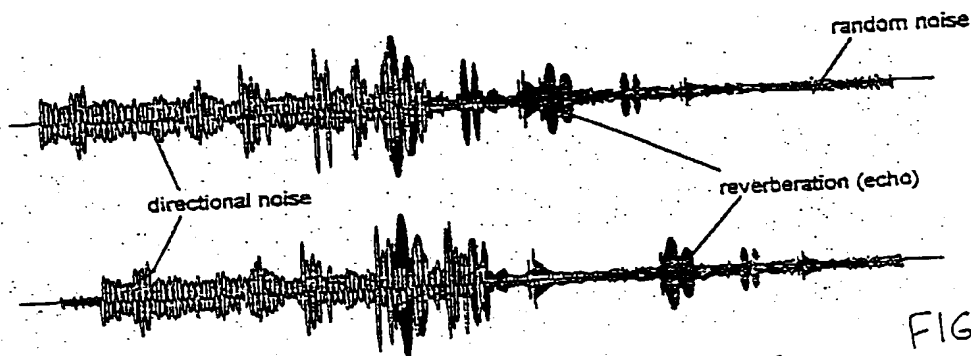


FIG. 18B

Left and Right Input Channels
(corrupted with random noise, directional noise and reverberation)

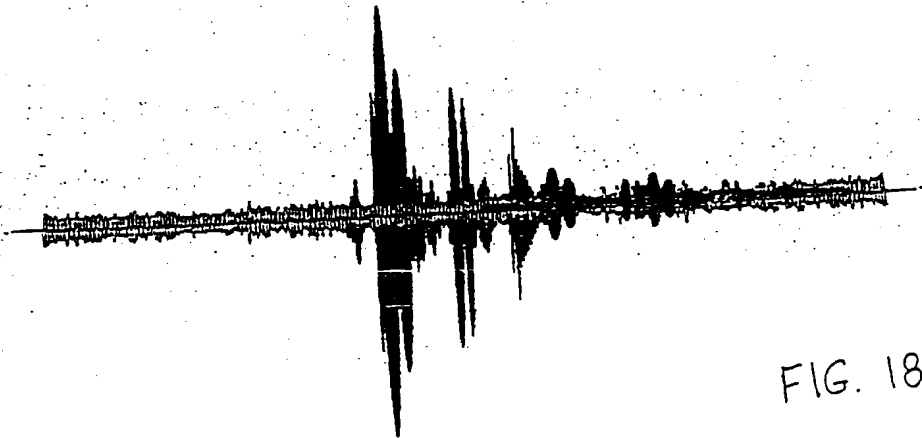


FIG. 18C

Beamformer Output

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(56) Documents cited
GB 2021902A
GB 1532495
GB 1508750
GB 1497957
GB 1412386
(58) Field of search
H4L
(71) Applicants
Gen Engineering Inc.,
No. 10-15,
Koyama 7-Chome,
Shinagawa-Ku,
Tokyo,
Japan.
(72) Inventors
Hiroshi Ono
(74) Agents
Marks & Clerk,
57-60 Lincoln's Inn Fields,
London, WC2A 3LS.

(54) **A two-way communication device**

(57) A two-way communication device comprises an ear-insert member having a vibration pick up type microphone combined with a speaker. A housing unit contains an automatic Vox controlling circuit to control automatically the power levels of transmitted and received signals. The ear insert member and the housing unit are connected electrically through wires or through a wireless.

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FIG. 1

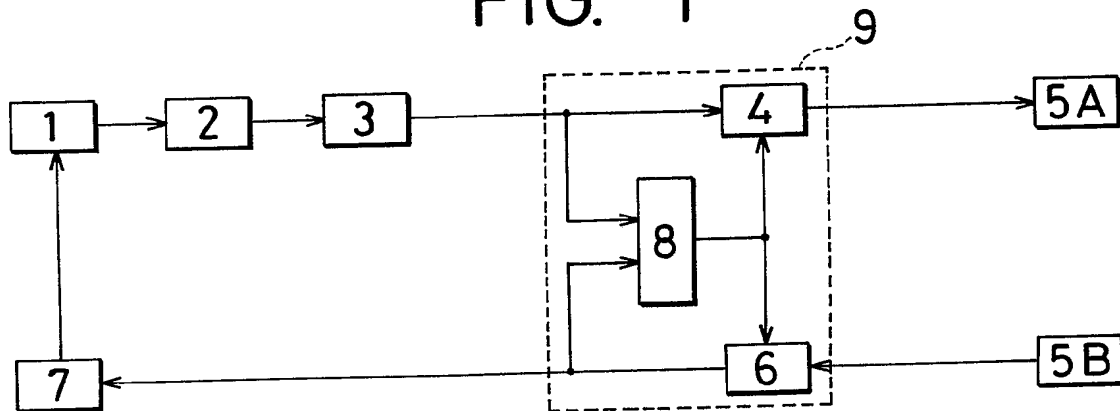


FIG. 2

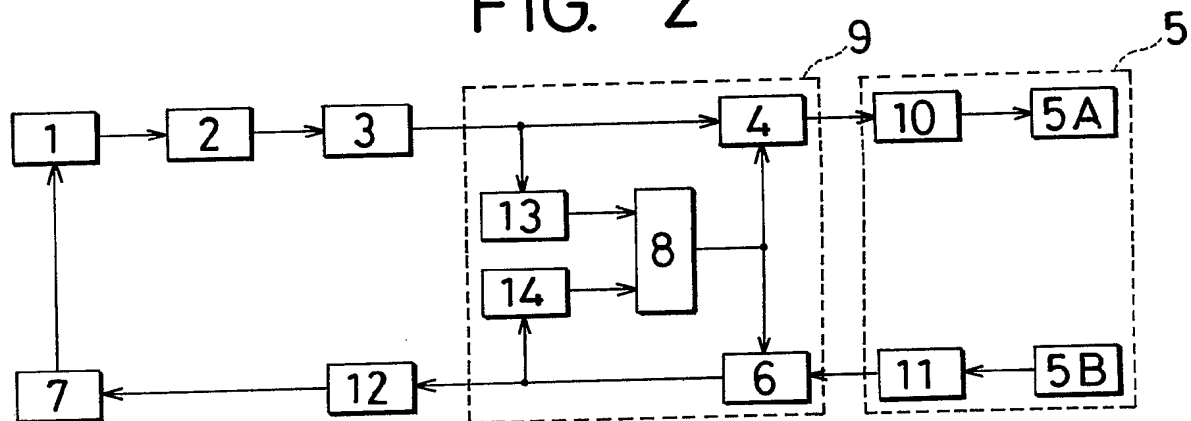


FIG. 3

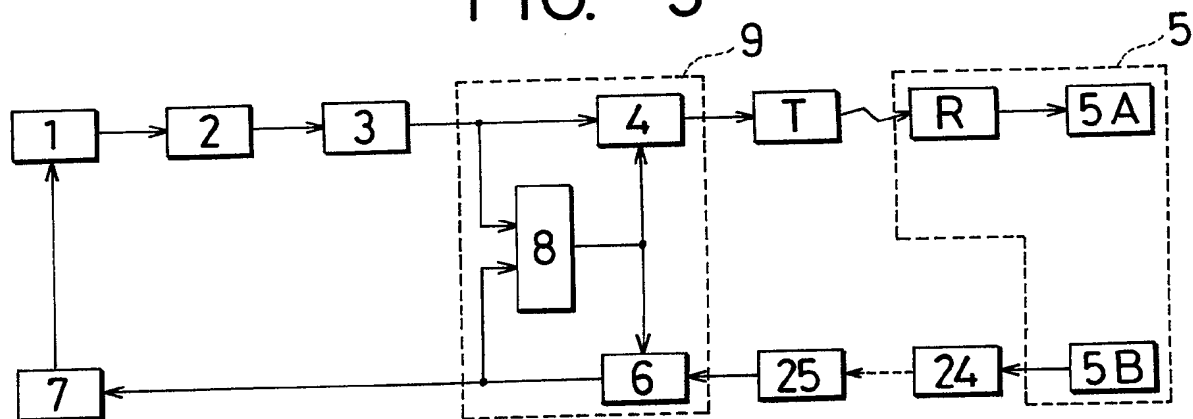


FIG. 4

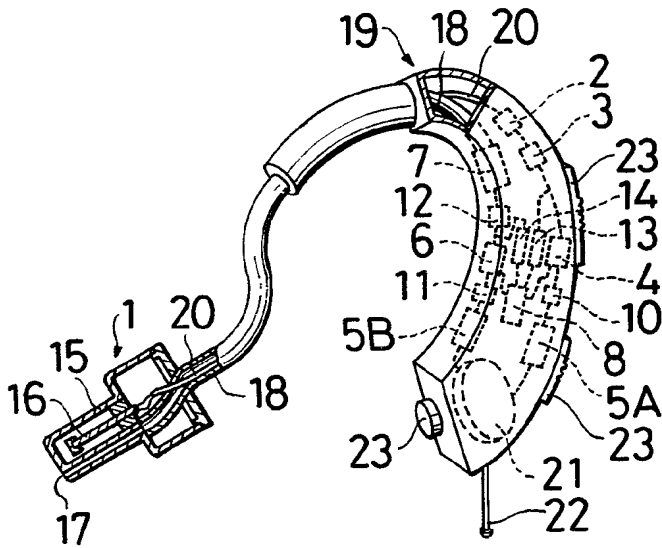


FIG. 5

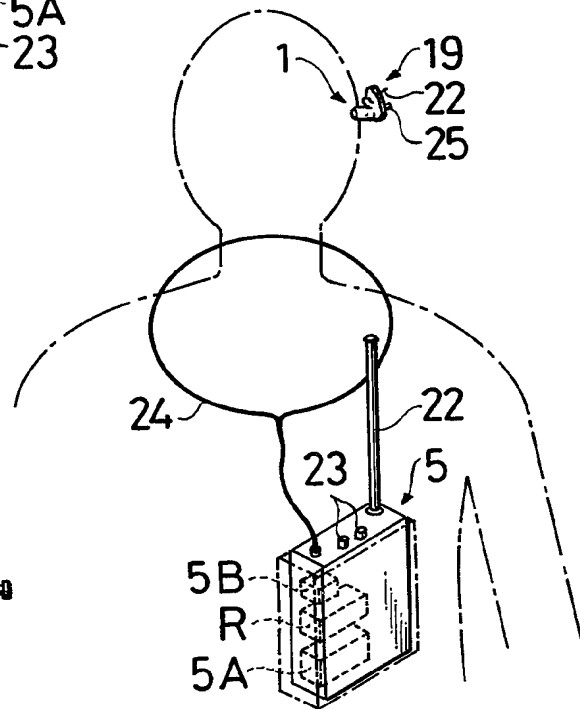
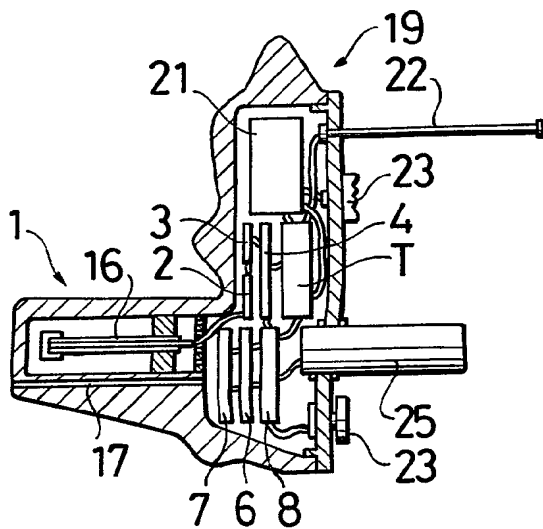


FIG. 6



SPECIFICATION

A two-way communication device

5 The present invention relates to a two-way communication device. Such a device allows simultaneous talking and listening and uses an ear-insert member, comprising a vibration pick-up type ear microphone combined with a speaker which may be one of several types, inserted into one ear canal of the user to prevent the occurrence of feedback or "howl-round" when the sound level produced by the speaker is high to allow a user to listen clearly in a very noisy environment.

15 In a known arrangement, a vibration pick-up type ear microphone (which will hereinafter be referred to as an ear mic) is inserted into the external auditory canal of one ear of a user, and serves to pick up voice signals (vibrations) conducted through his temporal bones around the external auditory canal wall. Such a known ear mic can be combined with a speaker, for instance a conventional sound pressure type ear-phone or the like.

25 An arrangement has been tried comprises an ear-insert member comprising the ear mic and a sound pressure type speaker combined with a conventional FM transceiver in order to attempt to transmit and receive in a high noise level environment. However, the following disadvantages were found.

30 It had been thought that feedback phenomena or "howl-round" would not occur even if the speaker produced a relatively high sound level, because only vibrations conducted through the temporal bones should have been picked up by the ear mic. However, when the speaker sound level was increased, for example, to between 80 and 100 dB, to permit easy listening in a very noisy environment, it was found that the speaker sounds were being picked up by the ear mic, so that "howl-round" occurred.

40 Moreover, it was found that, if output level of the speaker was set to a relatively high level in order to allow communication in a very noisy environment, the contemplative faculty of the user was adversely influenced.

45 According to the invention, there is provided a two-way communication device comprising an ear-insert member and a housing unit having electrical circuits, the ear-insert member housing a vibration pick up type microphone combined with a speaker, and an automatic Vox controlling circuit to control automatically the power level of transmitted and received signals being provided in one of electrical circuits of the device.

55 It is thus possible to provide a two-way communication device which satisfies the following technical requirements (1) to (6):

(1) By using the ear mic in the transmitting system of the device, noises can be excluded so that clear voice sounds can be transmitted when used in a very noisy environment, for example at a sound level of 110 dB(A).

(2) By combining the ear mic with the speaker used in the receiving system of the device, communication, i.e. simultaneous talking and listening,

can be achieved through at least one ear of the user leaving his hands free.

(3) The occurrence of howl round is substantially prevented, even when output level of the speaker is relatively high, for example 100 dB, thus permitting clear communication in a very noisy environment.

(4) While the user is talking, the output level of the speaker is reduced, whereas, during listening, the signal level from the ear mic is decreased and the output level of the speaker increased.

(5) When communication is performed by a wireless transmitting and receiving system, a conventional device such as a two-band transceiver can be used. If a wire system is used, a conventional wire transmitting and receiving device such as an inter-phone can be used.

(6) While the user is talking and listening, it is not necessary for both ears to be closed completely, so that he can listen to sounds around him to improve safety; in this case, an ear-insert member comprising the ear mic and speaker is inserted into one ear canal, which, however, is not closed up completely.

A preferred two-way communication device uses only one ear of a user into which an ear-insert member is placed comprising the ear mic and speaker and having an automatic Vox controlling circuit. The automatic Vox controlling circuit provides automatic gain controlling to make the output level of received signals in low and the input level of transmitted signals high when the user is talking, and in contrast with this, when the user is listening, to make the transmitted level low and the received level high.

The invention will be further described, by way of example, with reference to the accompanying drawings, in which:

Figures 1 to 3 are block diagrams of preferred embodiments of the present invention;

Figure 4 is an isometric view, partly cut away, of an ear hanging type embodiment of the present invention.

Figure 5 is an isometric view showing another embodiment of the present invention.

Figure 6 is a sectional view of an ear-insert member shown in *Figure 5*.

Figure 1 is a diagram of a first embodiment comprising a wireless system for two-way communication. The output signals of an ear mic 1, which picks up vibrations conducted through the temporal bones in the external auditory canal and converts them to electrical signals, are transmitted by a transmitting circuit 5A of a radio set 5 through amplifier 2, a band-pass filter 3, and a variable attenuator 4.

Signals received by a receiving circuit 5B of the radio set 5 are transduced to audible sounds pressure type speaker 7, which is combined with the ear mic 1, through a variable attenuator 6.

In the above transmitting and receiving system, the output and input signals are detected by a detector, and the detected signals are supplied to a comparator circuit 8 to control or correct the variable attenuator 4 and 6. Thus, an automatic Vox controlling circuit 9 is provided by the variable attenuator 4, 6 and the comparator circuit 8.

Another preferred embodiment of the present invention is illustrated in Figures 2 and 4. In a transmitting system of this embodiment, output signals of an ear mic 1 are amplified by a pre-amplifier 2 and supplied to a band-pass filter 3 having a frequency pass-band of 500 to 3,000 Hz. The signals are then supplied to an FM amplifier 10 of the wireless radio set 5 through the variable attenuator 4, and are broadcast by the transmitting circuit 5A in the form of an FM transmitter.

In a receiving system of this embodiment, input signals are received by the receiving circuit 5B, which for example comprises RX. ANT Filter and RF & LF amplifier are supplied to an AF amplifier 12 through the variable attenuator 6, to be transduced to audible sounds. In the above systems, the transmitting and receiving signals are each detected by detectors 13 and 14, and supplied to a comparator circuit 8, by which the variable attenuator 4 and 6 are controlled so as to reduce the level of the received signals when level of the transmitted signals is high, i.e. when the user is talking, and so as to reduce the level of the transmitted signals and simultaneously increase the level of the received signals when the user has finished talking.

The transmitting and receiving device is formed as a "one-ear-hanging" type, ear-insert type, or helmet type, or is housed in a spectacle frame.

An embodiment of an ear hanging-type of device is shown in Figure 4. Numeral 1 represents the ear mic inserted into the external auditory canal of one ear of the user, the ear mic 1 comprising a case 15 having a sound path 17 and a vibration pick up member 16 such as a piezoelectric element. The ear mic 1 is connected to an ear hanging member 19 through a tube 18 in which leads 20 are housed to transmit output signals of the vibration pick up member 16 to electrical circuits housed in the ear hanging member 19.

In Figure 4, numeral 21 represents an electrical power source, 22 an antenna, 23 a switch, and the other numerals in this Figure represent the same parts as in Figure 2.

Although the above description relates to an embodiment using a wireless system, the invention can be used with a wire transmitting and receiving system.

The ear-insert member can be connect through a wireless system without using the tube and leads shown in Figure 4 to a portable housing unit, and such an embodiment is shown in Figures 3, 5 and 6.

In the transmitting system of this embodiment, the output signals of the ear mic 1 housed in the ear-insert member 19 are transmitted by a wireless transmitter T such as an FM transmitter housed in the ear-insert member 19, and the transmitted signals are received by a receiver R housed in a portable housing unit 5, from which the user's speech is transmitted to another user. In the receiving system, speech signals from the other user are received by a receiving circuit 5B included in the portable housing unit 5, and the received signals are transmitted to the ear-insert member 19 through an inductive system comprising a loop antenna 24 fixed to the portable housing unit 5 and an induction coil

25 fixed to the ear-insert member 19. The received signals are then transduced to audible signals by the sound pressure type speaker 7 and are passed into the external auditory canal of the user through the sound path 17. Although in this embodiment the Vox controlling circuit 9 is shown in the ear-insert member 19, it may alternatively be disposed in the portable housing unit 5.

This embodiment allows transmitting and receiving operations at high power levels to be used for remote communication, and permits greater freedom of movement to the user. Because there are no leads or the like to connect the ear-insert member to the portable housing unit, it is less likely that the ear mic would pick up electrical noise to which leads might be susceptible.

CLAIMS

1. A two-way communication device comprising an ear-insert member and a housing unit having electrical circuits, the ear-insert member housing a vibration pick up type microphone combined with a speaker, and an automatic Vox controlling circuit to control automatically the power level of transmitted and received signals being provided in one of electrical circuits of the device.
2. A two-way communication device as claimed in claim 1, wherein the ear-insert member and the housing unit are connected through a wire system which comprises a tube containing leads and defining a sound path through which audible sounds pass from the speaker into the external auditory canal of a user.
3. A two-way communication device as claimed in claim 1, wherein the ear-insert member and the housing unit are connected through a wireless system.
4. A two-way communication device substantially as hereinbefore described with eference to and as illustrated in the accompanying drawings.

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H 0 4 B 7/26	1 0 9	H 7304-5K		
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(71)出願人 000005821

松下電器産業株式会社

大阪府門真市大字門真1006番地

(72)発明者 喜多村 新一

大阪府門真市大字門真1006番地 松下電器

産業株式会社内

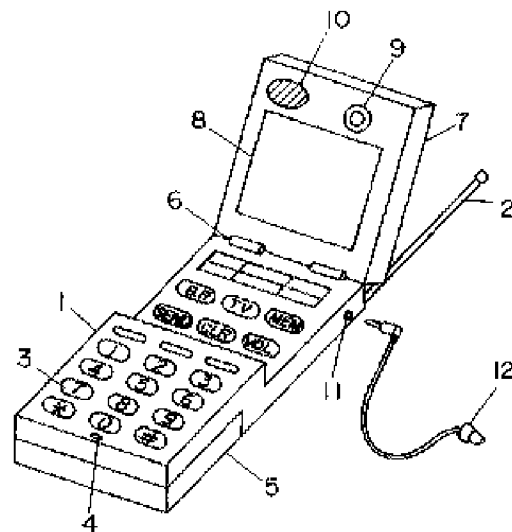
(74)代理人 弁理士 小銀治 明 (外2名)

(54)【発明の名称】 携帯無線式TV電話

(57)【要約】

【目的】 フリップ部を開いたとき、モニター、CCDカメラ、スピーカに向かって一定の距離を保ち、TVモニターを視認しながらスピーカホンまたはイヤホンにより無線式TV電話として利用でき、またフリップ部を閉じ、装置本体側にTVモニターが格納された時、イヤピースに耳を当て、通常の携帯電話として利用することができるようにした携帯無線式TV電話を提供する。

【構成】 装置本体1に操作部と、マイク4を備え、また前記装置本体1にヒンジ6で連結されたフリップ部7を備えており、前記フリップ部7を閉じた時に装置本体1に格納されるフリップ部7の表面にモニターと、CCDカメラ9と、スピーカ10を、フリップ部7を閉じたとき操作部と同一面側となるフリップ部7裏面にイヤピースを備えている。



Electronic Acknowledgement Receipt

EFS ID:	26792499
Application Number:	15245031
International Application Number:	
Confirmation Number:	1285
Title of Invention:	Power Control for Battery Powered Personal Area Network Device System and Method
First Named Inventor/Applicant Name:	Eric Christian Hirsch
Customer Number:	133690
Filer:	John Darrell Goodhue/Ashlyn Nguyen
Filer Authorized By:	John Darrell Goodhue
Attorney Docket Number:	BRAGI GmbH-P0017
Receipt Date:	30-AUG-2016
Filing Date:	
Time Stamp:	18:19:45
Application Type:	Utility under 35 USC 111(a)

Payment information:

Submitted with Payment	no
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File Listing:

Document Number	Document Description	File Name	File Size(Bytes)/ Message Digest	Multi Part /.zip	Pages (if appl.)
1	Non Patent Literature	Update43November132015.pdf	4253804	no	15
			26f9ae2bd1145e6e5a91f20a9b16ee306dc d152c		

Warnings: Page 126 of 270

Information:					
2	Non Patent Literature	Update39October52015.pdf	6523516	no	20
			0ad4193a92fbc7c39ea13a292d43cfa944cfdf8e		
Warnings:					
Information:					
3	Non Patent Literature	Update40October192015.pdf	5399811	no	20
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Warnings:					
Information:					
4	Non Patent Literature	Update41November22015.pdf	3337258	no	14
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Warnings:					
Information:					
5	Non Patent Literature	Update34August62015.pdf	4639632	no	20
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Warnings:					
Information:					
6	Non Patent Literature	Update32July152015.pdf	4856597	no	17
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Warnings:					
Information:					
7	Non Patent Literature	Update31June242015.pdf	4636264	no	19
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Warnings:					
Information:					
8	Non Patent Literature	Update27April12015.pdf	3980964	no	17
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Information:					

9	Non Patent Literature	Update36September102015.pdf	3386456	no	15
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Information:					
10	Non Patent Literature	Update9Mar282014.pdf	1423870	no	7
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Warnings:					
Information:					
11	Non Patent Literature	A_one_size_disposable_hearing_aid_is_introduced.pdf	123404	no	4
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Information:					
12	Non Patent Literature	Update2February142014.pdf	3598244	no	14
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Warnings:					
Information:					
13	Non Patent Literature	Update1February122014.pdf	1583282	no	9
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Warnings:					
Information:					
14	Non Patent Literature	Update3February172014.pdf	5792675	no	17
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Warnings:					
Information:					
15	Non Patent Literature	Update4February212014.pdf	3421673	no	12
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Warnings:					
Information:					

16	Non Patent Literature	Update6March112014.pdf	1657923	no	7
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Warnings:					
Information:					
17	Non Patent Literature	update7March222014.pdf	2478404	no	11
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Warnings:					
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18	Foreign Reference	EP1017252A2.pdf	346783	no	25
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Information:					
19	Foreign Reference	GB2074817A.pdf	263833	no	5
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Information:					
20	Foreign Reference	20151030042456909.pdf	66008	no	2
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Warnings:					
Information:					
Total Files Size (in bytes):			61770401		

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.

PATENT APPLICATION FEE DETERMINATION RECORD Substitute for Form PTO-875						Application or Docket Number 15/245,031	
APPLICATION AS FILED - PART I							
(Column 1)		(Column 2)		SMALL ENTITY		OTHER THAN SMALL ENTITY	
FOR	NUMBER FILED	NUMBER EXTRA	RATE(\$)	FEE(\$)		RATE(\$)	FEE(\$)
BASIC FEE (37 CFR 1.16(a), (b), or (c))	N/A	N/A	N/A	70		N/A	
SEARCH FEE (37 CFR 1.16(k), (l), or (m))	N/A	N/A	N/A	300		N/A	
EXAMINATION FEE (37 CFR 1.16(o), (p), or (q))	N/A	N/A	N/A	360		N/A	
TOTAL CLAIMS (37 CFR 1.16(j))	20	minus 20 = *	x 40 =	0.00	OR		
INDEPENDENT CLAIMS (37 CFR 1.16(h))	2	minus 3 = *	x 210 =	0.00			
APPLICATION SIZE FEE (37 CFR 1.16(s))	If the specification and drawings exceed 100 sheets of paper, the application size fee due is \$310 (\$155 for small entity) for each additional 50 sheets or fraction thereof. See 35 U.S.C. 41(a)(1)(G) and 37 CFR 1.16(s).			0.00			
MULTIPLE DEPENDENT CLAIM PRESENT (37 CFR 1.16(j))				0.00			
			TOTAL	730		TOTAL	
* If the difference in column 1 is less than zero, enter "0" in column 2.							
APPLICATION AS AMENDED - PART II							
(Column 1)		(Column 2)		(Column 3)		SMALL ENTITY	
AMENDMENT A	CLAIMS REMAINING AFTER AMENDMENT	HIGHEST NUMBER PREVIOUSLY PAID FOR	PRESENT EXTRA	RATE(\$)	ADDITIONAL FEE(\$)		RATE(\$)
	Total (37 CFR 1.16(i))	*	Minus **	=	x =	OR	x =
	Independent (37 CFR 1.16(h))	*	Minus ***	=	x =	OR	x =
	Application Size Fee (37 CFR 1.16(s))					OR	
	FIRST PRESENTATION OF MULTIPLE DEPENDENT CLAIM (37 CFR 1.16(j))					OR	
			TOTAL ADD'L FEE		OR	TOTAL ADD'L FEE	
(Column 1)		(Column 2)		(Column 3)		SMALL ENTITY	
AMENDMENT B	CLAIMS REMAINING AFTER AMENDMENT	HIGHEST NUMBER PREVIOUSLY PAID FOR	PRESENT EXTRA	RATE(\$)	ADDITIONAL FEE(\$)		RATE(\$)
	Total (37 CFR 1.16(i))	*	Minus **	=	x =	OR	x =
	Independent (37 CFR 1.16(h))	*	Minus ***	=	x =	OR	x =
	Application Size Fee (37 CFR 1.16(s))					OR	
	FIRST PRESENTATION OF MULTIPLE DEPENDENT CLAIM (37 CFR 1.16(j))					OR	
			TOTAL ADD'L FEE		OR	TOTAL ADD'L FEE	
* If the entry in column 1 is less than the entry in column 2, write "0" in column 3. ** If the "Highest Number Previously Paid For" IN THIS SPACE is less than 20, enter "20". *** If the "Highest Number Previously Paid For" IN THIS SPACE is less than 3, enter "3". The "Highest Number Previously Paid For" (Total or Independent) is the highest found in the appropriate box in column 1.							



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United States Patent and Trademark Office
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Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NUMBER	FILING OR 371(C) DATE	FIRST NAMED APPLICANT	ATTY. DOCKET NO./TITLE
15/245,031	08/23/2016	Eric Christian Hirsch	BRAGI GmbH-P0017

CONFIRMATION NO. 1285

FORMALITIES LETTER



133690
Goodhue, Coleman & Owens, P.C.
650 S. Prairie View Dr.
Suite 125, PMB #209
West Des Moines, IA 50266

Date Mailed: 09/07/2016

NOTICE TO FILE MISSING PARTS OF NONPROVISIONAL APPLICATION

FILED UNDER 37 CFR 1.53(b)

Filing Date Granted

Items Required To Avoid Abandonment:

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

- The statutory basic filing fee is missing.
- The application search fee must be submitted.
- The application examination fee must be submitted.
- Surcharge as set forth in 37 CFR 1.16(f) must be submitted.

The surcharge is due for any one of:

- late submission of the basic filing fee, search fee, or examination fee,
- late submission of inventor's oath or declaration,
- filing an application that does not contain at least one claim on filing, or
- submission of an application filed by reference to a previously filed application.

SUMMARY OF FEES DUE:

The fee(s) required within **TWO MONTHS** from the date of this Notice to avoid abandonment is/are itemized below. Small entity discount is in effect. If applicant is qualified for micro entity status, an acceptable Certification of Micro Entity Status must be submitted to establish micro entity status. (See 37 CFR 1.29 and forms PTO/SB/15A and 15B.)

- \$ **70** basic filing fee.
- \$ **70** surcharge.
- \$ **300** search fee.
- \$ **360** examination fee.
- \$(**0**) previous unapplied payment amount.
- \$ **800** TOTAL FEE BALANCE DUE.

Items Required To Avoid Processing Delays:

Applicant is notified that the above-identified application contains the deficiencies noted below. No period for reply is set forth in this notice for correction of these deficiencies. However, if a deficiency relates to the inventor's

oath or declaration, the applicant must file an oath or declaration in compliance with 37 CFR 1.63, or a substitute statement in compliance with 37 CFR 1.64, executed by or with respect to each actual inventor no later than the expiration of the time period set in the "Notice of Allowability" to avoid abandonment. See 37 CFR 1.53(f).

- A properly executed inventor's oath or declaration has not been received for the following inventor(s):
Eric Christian Hirsch
Peter Vincent Boesen

Replies must be received in the USPTO within the set time period or must include a proper Certificate of Mailing or Transmission under 37 CFR 1.8 with a mailing or transmission date within the set time period. For more information and a suggested format, see Form PTO/SB/92 and MPEP 512.

Replies should be mailed to:

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

Registered users of EFS-Web may alternatively submit their reply to this notice via EFS-Web, including a copy of this Notice and selecting the document description "Applicant response to Pre-Exam Formalities Notice".
<https://portal.uspto.gov/authenticate/AuthenticateUserLocalEPF.html>

For more information about EFS-Web please call the USPTO Electronic Business Center at 1-866-217-9197 or visit our website at <http://www.uspto.gov/ebc>.

If you are not using EFS-Web to submit your reply, you must include a copy of this notice.

Questions about the contents of this notice and the requirements it sets forth should be directed to the Office of Data Management, Application Assistance Unit, at
(571) 272-4000 or (571) 272-4200 or 1-888-786-0101.

/ldvan/



UNITED STATES PATENT AND TRADEMARK OFFICE

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

APPLICATION NUMBER	FILING or 371(c) DATE	GRP ART UNIT	FIL FEE REC'D	ATTY. DOCKET NO	TOT CLAIMS	IND CLAIMS
15/245,031	08/23/2016	2656	0.00	BRAGI GmbH-P0017	20	2

CONFIRMATION NO. 1285

FILING RECEIPT



0000000083553343

133690
Goodhue, Coleman & Owens, P.C.
650 S. Prairie View Dr.
Suite 125, PMB #209
West Des Moines, IA 50266

Date Mailed: 09/07/2016

Receipt is acknowledged of this non-provisional patent application. The application will be taken up for examination in due course. Applicant will be notified as to the results of the examination. Any correspondence concerning the application must include the following identification information: the U.S. APPLICATION NUMBER, FILING DATE, NAME OF APPLICANT, and TITLE OF INVENTION. Fees transmitted by check or draft are subject to collection. Please verify the accuracy of the data presented on this receipt. **If an error is noted on this Filing Receipt, please submit a written request for a Filing Receipt Correction. Please provide a copy of this Filing Receipt with the changes noted thereon. If you received a "Notice to File Missing Parts" for this application, please submit any corrections to this Filing Receipt with your reply to the Notice. When the USPTO processes the reply to the Notice, the USPTO will generate another Filing Receipt incorporating the requested corrections**

Inventor(s)

Eric Christian Hirsch, Munchen, GERMANY;
Peter Vincent Boesen, Munchen, GERMANY;

Applicant(s)

BRAGI GmbH, Munchen, GERMANY;

Power of Attorney: None

Domestic Priority data as claimed by applicant

This appln claims benefit of 62/211,767 08/29/2015

Foreign Applications for which priority is claimed (You may be eligible to benefit from the **Patent Prosecution Highway** program at the USPTO. Please see <http://www.uspto.gov> for more information.) - None.

Foreign application information must be provided in an Application Data Sheet in order to constitute a claim to foreign priority. See 37 CFR 1.55 and 1.76.

Permission to Access Application via Priority Document Exchange: Yes

Permission to Access Search Results: Yes

Applicant may provide or rescind an authorization for access using Form PTO/SB/39 or Form PTO/SB/69 as appropriate.

If Required, Foreign Filing License Granted: 09/01/2016

The country code and number of your priority application, to be used for filing abroad under the Paris Convention, is **US 15/245,031**

Projected Publication Date: To Be Determined - pending completion of Missing Parts

Non-Publication Request: No

Early Publication Request: No

**** SMALL ENTITY ****

Title

Power Control for Battery Powered Personal Area Network Device System and Method

Preliminary Class

381

Statement under 37 CFR 1.55 or 1.78 for AIA (First Inventor to File) Transition Applications: No

PROTECTING YOUR INVENTION OUTSIDE THE UNITED STATES

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

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

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

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

For information on preventing theft of your intellectual property (patents, trademarks and copyrights), you may wish to consult the U.S. Government website, <http://www.stopfakes.gov>. Part of a Department of Commerce initiative, this website includes self-help "toolkits" giving innovators guidance on how to protect intellectual property in specific countries such as China, Korea and Mexico. For questions regarding patent enforcement issues, applicants may call the U.S. Government hotline at 1-866-999-HALT (1-866-999-4258).

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Title 37, Code of Federal Regulations, 5.11 & 5.15

GRANTED

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

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

The grant of a license does not in any way lessen the responsibility of a licensee for the security of the subject matter as imposed by any Government contract or the provisions of existing laws relating to espionage and the national security or the export of technical data. Licensees should apprise themselves of current regulations especially with respect to certain countries, of other agencies, particularly the Office of Defense Trade Controls, Department of State (with respect to Arms, Munitions and Implements of War (22 CFR 121-128)); the Bureau of Industry and Security, Department of Commerce (15 CFR parts 730-774); the Office of Foreign Assets Control, Department of Treasury (31 CFR Parts 500+) and the Department of Energy.

NOT GRANTED

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

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PATENT
Attorney Docket No.
BRAGI GmbH-P0017

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re Application of: Hirsch et al. Application No. 15/245,031 Filed: August 23, 2016 For: Power Control for Battery Powered Personal Area Network Device System and Method	Confirmation No. 1285 Group Art Unit: 2656 Examiner:
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Mail Stop Missing Parts
Commissioner for Patents
P.O.Box 1450
Alexandria, VA 22313-1450

VIA EFS

Commissioner:

**RESPONSE TO NOTICE TO FILE MISSING PARTS OF NONPROVISIONAL
APPLICATION**

This Response is in reply to the Notice to File Missing Parts of Non-Provisional
Application mailed September 7, 2016.

The Notice to File Missing Parts identifies the following items as required to avoid
abandonment:

- The statutory basic filing fee.
- The surcharge fee must be submitted.
- The application search fee must be submitted.
- The application examination fee must be submitted.

These fees are being concurrently paid with the filing of this response (\$800).

Please grant any extensions of time required to enter this response and charge any additional fees to Deposit Account 506801.

Respectfully submitted,

Goodhue, Coleman & Owens, P.C

Dated: September 14, 2016

By: / John D. Goodhue /
Reg. No. 47603
(515) 218-7888



UNITED STATES PATENT AND TRADEMARK OFFICE

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United States Patent and Trademark Office
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Alexandria, Virginia 22313-1450
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APPLICATION NUMBER	FILING OR 371(C) DATE	FIRST NAMED APPLICANT	ATTY. DOCKET NO./TITLE
15/245,031	08/23/2016	Eric Christian Hirsch	BRAGI GmbH-P0017

CONFIRMATION NO. 1285

FORMALITIES LETTER



0000000085553344

133690
Goodhue, Coleman & Owens, P.C.
650 S. Prairie View Dr.
Suite 125, PMB #209
West Des Moines, IA 50266

Date Mailed: 09/07/2016

NOTICE TO FILE MISSING PARTS OF NONPROVISIONAL APPLICATION

FILED UNDER 37 CFR 1.53(b)

Filing Date Granted

Items Required To Avoid Abandonment:

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

- The statutory basic filing fee is missing.
- The application search fee must be submitted.
- The application examination fee must be submitted.
- Surcharge as set forth in 37 CFR 1.16(f) must be submitted.

The surcharge is due for any one of:

- late submission of the basic filing fee, search fee, or examination fee,
- late submission of inventor's oath or declaration,
- filing an application that does not contain at least one claim on filing, or
- submission of an application filed by reference to a previously filed application.

SUMMARY OF FEES DUE:

The fee(s) required within **TWO MONTHS** from the date of this Notice to avoid abandonment is/are itemized below. Small entity discount is in effect. If applicant is qualified for micro entity status, an acceptable Certification of Micro Entity Status must be submitted to establish micro entity status. (See 37 CFR 1.29 and forms PTO/SB/15A and 15B.)

- \$ 70 basic filing fee.
- \$ 70 surcharge.
- \$ 300 search fee.
- \$ 360 examination fee.
- \$(0) previous unapplied payment amount.
- \$ 800 TOTAL FEE BALANCE DUE.

Items Required To Avoid Processing Delays:

Applicant is notified that the above-identified application contains the deficiencies noted below. No period for reply is set forth in this notice for correction of these deficiencies. However, if a deficiency relates to the inventor's

oath or declaration, the applicant must file an oath or declaration in compliance with 37 CFR 1.63, or a substitute statement in compliance with 37 CFR 1.64, executed by or with respect to each actual inventor no later than the expiration of the time period set in the "Notice of Allowability" to avoid abandonment. See 37 CFR 1.53(f).

- A properly executed inventor's oath or declaration has not been received for the following inventor(s):

Eric Christian Hirsch

Peter Vincent Boesen

Replies must be received in the USPTO within the set time period or must include a proper Certificate of Mailing or Transmission under 37 CFR 1.8 with a mailing or transmission date within the set time period. For more information and a suggested format, see Form PTO/SB/92 and MPEP 512.

Replies should be mailed to:

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

Registered users of EFS-Web may alternatively submit their reply to this notice via EFS-Web, including a copy of this Notice and selecting the document description "Applicant response to Pre-Exam Formalities Notice".

<https://portal.uspto.gov/authenticate/AuthenticateUserLocalEPF.html>

For more information about EFS-Web please call the USPTO Electronic Business Center at 1-866-217-9197 or visit our website at <http://www.uspto.gov/ebc>.

If you are not using EFS-Web to submit your reply, you must include a copy of this notice.

Questions about the contents of this notice and the requirements it sets forth should be directed to the Office of Data Management, Application Assistance Unit, at (571) 272-4000 or (571) 272-4200 or 1-888-786-0101.

/ldvan/

Electronic Patent Application Fee Transmittal

Application Number:	15245031			
Filing Date:	23-Aug-2016			
Title of Invention:	Power Control for Battery Powered Personal Area Network Device System and Method			
First Named Inventor/Applicant Name:	Eric Christian Hirsch			
Filer:	John Darrell Goodhue/Ashlyn Nguyen			
Attorney Docket Number:	BRAGI GmbH-P0017			
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	70	70
Utility Search Fee	2111	1	300	300
Utility Examination Fee	2311	1	360	360
Pages:				
Claims:				
Miscellaneous-Filing:				
Late Filing Fee for Oath or Declaration	2051	1	70	70
Petition: Page 141 of 270				

Description	Fee Code	Quantity	Amount	Sub-Total in USD(\$)
Patent-Appeals-and-Interference:				
Post-Allowance-and-Post-Issuance:				
Extension-of-Time:				
Miscellaneous:				
Total in USD (\$)				800

Electronic Acknowledgement Receipt

EFS ID:	26924409
Application Number:	15245031
International Application Number:	
Confirmation Number:	1285
Title of Invention:	Power Control for Battery Powered Personal Area Network Device System and Method
First Named Inventor/Applicant Name:	Eric Christian Hirsch
Customer Number:	133690
Filer:	John Darrell Goodhue/Ashlyn Nguyen
Filer Authorized By:	John Darrell Goodhue
Attorney Docket Number:	BRAGI GmbH-P0017
Receipt Date:	14-SEP-2016
Filing Date:	23-AUG-2016
Time Stamp:	15:11:25
Application Type:	Utility under 35 USC 111(a)

Payment information:

Submitted with Payment	yes
Payment Type	Deposit Account
Payment was successfully received in RAM	\$800
RAM confirmation Number	1664
Deposit Account	506801
Authorized User	GOODHUE, JOHN D

The Director of the USPTO is hereby authorized to charge indicated fees and credit any overpayment as follows:

Page 143 of 270

Charge any Additional Fees required under 37 CFR 1.17 (Patent application and reexamination processing fees)

File Listing:					
Document Number	Document Description	File Name	File Size(Bytes)/ Message Digest	Multi Part /.zip	Pages (if appl.)
1	Applicant Response to Pre-Exam Formalities Notice	BRAGIGmbH-P0017_15245031_RESPOND-TO-NTC-TO-FILE-MISSING-PARTS_EFS.pdf	568266	no	4
			5ec22c2acc17653904401b4d590e3820ea6d9d79		
Warnings:					
Information:					
2	Fee Worksheet (SB06)	fee-info.pdf	37252	no	2
			084edadc18da01e42e36ebcd1c0f1d3b8851f4db		
Warnings:					
Information:					
Total Files Size (in bytes):			605518		
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. <u>New Applications Under 35 U.S.C. 111</u> 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. <u>National Stage of an International Application under 35 U.S.C. 371</u> 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. <u>New International Application Filed with the USPTO as a Receiving Office</u> 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.					



UNITED STATES PATENT AND TRADEMARK OFFICE

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

APPLICATION NUMBER	FILING or 371(c) DATE	GRP ART UNIT	FIL FEE REC'D	ATTY. DOCKET NO	TOT CLAIMS	IND CLAIMS
15/245,031	08/23/2016	2656	800	BRAGI GmbH-P0017	20	2

CONFIRMATION NO. 1285

UPDATED FILING RECEIPT

133690

Goodhue, Coleman & Owens, P.C.
650 S. Prairie View Dr.
Suite 125, PMB #209
West Des Moines, IA 50266



Date Mailed: 09/22/2016

Receipt is acknowledged of this non-provisional patent application. The application will be taken up for examination in due course. Applicant will be notified as to the results of the examination. Any correspondence concerning the application must include the following identification information: the U.S. APPLICATION NUMBER, FILING DATE, NAME OF APPLICANT, and TITLE OF INVENTION. Fees transmitted by check or draft are subject to collection. Please verify the accuracy of the data presented on this receipt. **If an error is noted on this Filing Receipt, please submit a written request for a Filing Receipt Correction. Please provide a copy of this Filing Receipt with the changes noted thereon. If you received a "Notice to File Missing Parts" for this application, please submit any corrections to this Filing Receipt with your reply to the Notice. When the USPTO processes the reply to the Notice, the USPTO will generate another Filing Receipt incorporating the requested corrections**

Inventor(s)

Eric Christian Hirsch, Munchen, GERMANY;
Peter Vincent Boesen, Munchen, GERMANY;

Applicant(s)

BRAGI GmbH, Munchen, GERMANY;

Power of Attorney: None

Domestic Priority data as claimed by applicant

This appln claims benefit of 62/211,767 08/29/2015

Foreign Applications for which priority is claimed (You may be eligible to benefit from the **Patent Prosecution Highway** program at the USPTO. Please see <http://www.uspto.gov> for more information.) - None.

Foreign application information must be provided in an Application Data Sheet in order to constitute a claim to foreign priority. See 37 CFR 1.55 and 1.76.

Permission to Access Application via Priority Document Exchange: Yes

Permission to Access Search Results: Yes

Applicant may provide or rescind an authorization for access using Form PTO/SB/39 or Form PTO/SB/69 as appropriate.

If Required, Foreign Filing License Granted: 09/01/2016

The country code and number of your priority application, to be used for filing abroad under the Paris Convention, is **US 15/245,031**

Projected Publication Date: 03/02/2017

Non-Publication Request: No

Early Publication Request: No

**** SMALL ENTITY ****

Title

Power Control for Battery Powered Personal Area Network Device System and Method

Preliminary Class

381

Statement under 37 CFR 1.55 or 1.78 for AIA (First Inventor to File) Transition Applications: No

PROTECTING YOUR INVENTION OUTSIDE THE UNITED STATES

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

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

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

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

For information on preventing theft of your intellectual property (patents, trademarks and copyrights), you may wish to consult the U.S. Government website, <http://www.stopfakes.gov>. Part of a Department of Commerce initiative, this website includes self-help "toolkits" giving innovators guidance on how to protect intellectual property in specific countries such as China, Korea and Mexico. For questions regarding patent enforcement issues, applicants may call the U.S. Government hotline at 1-866-999-HALT (1-866-999-4258).

LICENSE FOR FOREIGN FILING UNDER
Title 35, United States Code, Section 184
Title 37, Code of Federal Regulations, 5.11 & 5.15

GRANTED

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

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

The grant of a license does not in any way lessen the responsibility of a licensee for the security of the subject matter as imposed by any Government contract or the provisions of existing laws relating to espionage and the national security or the export of technical data. Licensees should apprise themselves of current regulations especially with respect to certain countries, of other agencies, particularly the Office of Defense Trade Controls, Department of State (with respect to Arms, Munitions and Implements of War (22 CFR 121-128)); the Bureau of Industry and Security, Department of Commerce (15 CFR parts 730-774); the Office of Foreign Assets Control, Department of Treasury (31 CFR Parts 500+) and the Department of Energy.

NOT GRANTED

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

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The United States represents the largest, most dynamic marketplace in the world and is an unparalleled location for business investment, innovation, and commercialization of new technologies. The U.S. offers tremendous resources and advantages for those who invest and manufacture goods here. Through SelectUSA, our nation works to promote and facilitate business investment. SelectUSA provides information assistance to the international investor community; serves as an ombudsman for existing and potential investors; advocates on behalf of U.S. cities, states, and regions competing for global investment; and counsels U.S. economic development organizations on investment attraction best practices. To learn more about why the United States is the best country in the world to develop technology, manufacture products, deliver services, and grow your business, visit <http://www.SelectUSA.gov> or call +1-202-482-6800.



UNITED STATES PATENT AND TRADEMARK OFFICE

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

APPLICATION NUMBER	FILING OR 371(C) DATE	FIRST NAMED APPLICANT	ATTY. DOCKET NO./TITLE
15/245,031	08/23/2016	Eric Christian Hirsch	BRAGI GmbH-P0017

CONFIRMATION NO. 1285

INFORMAL NOTICE



133690
Goodhue, Coleman & Owens, P.C.
650 S. Prairie View Dr.
Suite 125, PMB #209
West Des Moines, IA 50266

Date Mailed: 09/22/2016

INFORMATIONAL NOTICE TO APPLICANT

Applicant is notified that the above-identified application contains the deficiencies noted below. No period for reply is set forth in this notice for correction of these deficiencies. However, if a deficiency relates to the inventor's oath or declaration, the applicant must file an oath or declaration in compliance with 37 CFR 1.63, or a substitute statement in compliance with 37 CFR 1.64, executed by or with respect to each actual inventor no later than the expiration of the time period set in the "Notice of Allowability" to avoid abandonment. See 37 CFR 1.53(f).

The item(s) indicated below are also required and should be submitted with any reply to this notice to avoid further processing delays.

- A properly executed inventor's oath or declaration has not been received for the following inventor(s):
Eric Christian Hirsch
Peter Vincent Boesen

Questions about the contents of this notice and the requirements it sets forth should be directed to the Office of Data Management, Application Assistance Unit, at (571) 272-4000 or (571) 272-4200 or 1-888-786-0101.

/nbekele/

PATENT APPLICATION FEE DETERMINATION RECORD Substitute for Form PTO-875						Application or Docket Number 15/245,031	
APPLICATION AS FILED - PART I							
(Column 1)		(Column 2)		SMALL ENTITY		OTHER THAN SMALL ENTITY	
FOR	NUMBER FILED	NUMBER EXTRA	RATE(\$)	FEE(\$)		RATE(\$)	FEE(\$)
BASIC FEE (37 CFR 1.16(a), (b), or (c))	N/A	N/A	N/A	70		N/A	
SEARCH FEE (37 CFR 1.16(k), (l), or (m))	N/A	N/A	N/A	300		N/A	
EXAMINATION FEE (37 CFR 1.16(o), (p), or (q))	N/A	N/A	N/A	360		N/A	
TOTAL CLAIMS (37 CFR 1.16(j))	20	minus 20 = *	x 40 =	0.00	OR		
INDEPENDENT CLAIMS (37 CFR 1.16(h))	2	minus 3 = *	x 210 =	0.00			
APPLICATION SIZE FEE (37 CFR 1.16(s))	If the specification and drawings exceed 100 sheets of paper, the application size fee due is \$310 (\$155 for small entity) for each additional 50 sheets or fraction thereof. See 35 U.S.C. 41(a)(1)(G) and 37 CFR 1.16(s).			0.00			
MULTIPLE DEPENDENT CLAIM PRESENT (37 CFR 1.16(j))				0.00			
			TOTAL	730		TOTAL	
* If the difference in column 1 is less than zero, enter "0" in column 2.							
APPLICATION AS AMENDED - PART II							
(Column 1)		(Column 2)		(Column 3)		SMALL ENTITY	
AMENDMENT A	CLAIMS REMAINING AFTER AMENDMENT	HIGHEST NUMBER PREVIOUSLY PAID FOR	PRESENT EXTRA	RATE(\$)	ADDITIONAL FEE(\$)		RATE(\$)
	Total (37 CFR 1.16(i))	*	Minus **	=	x =	OR	x =
	Independent (37 CFR 1.16(h))	*	Minus ***	=	x =	OR	x =
	Application Size Fee (37 CFR 1.16(s))					OR	
	FIRST PRESENTATION OF MULTIPLE DEPENDENT CLAIM (37 CFR 1.16(j))					OR	
			TOTAL ADD'L FEE		OR	TOTAL ADD'L FEE	
(Column 1)		(Column 2)		(Column 3)		SMALL ENTITY	
AMENDMENT B	CLAIMS REMAINING AFTER AMENDMENT	HIGHEST NUMBER PREVIOUSLY PAID FOR	PRESENT EXTRA	RATE(\$)	ADDITIONAL FEE(\$)		RATE(\$)
	Total (37 CFR 1.16(i))	*	Minus **	=	x =	OR	x =
	Independent (37 CFR 1.16(h))	*	Minus ***	=	x =	OR	x =
	Application Size Fee (37 CFR 1.16(s))					OR	
	FIRST PRESENTATION OF MULTIPLE DEPENDENT CLAIM (37 CFR 1.16(j))					OR	
			TOTAL ADD'L FEE		OR	TOTAL ADD'L FEE	
* If the entry in column 1 is less than the entry in column 2, write "0" in column 3. ** If the "Highest Number Previously Paid For" IN THIS SPACE is less than 20, enter "20". *** If the "Highest Number Previously Paid For" IN THIS SPACE is less than 3, enter "3". The "Highest Number Previously Paid For" (Total or Independent) is the highest found in the appropriate box in column 1.							



UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
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Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NUMBER	FILING OR 371(C) DATE	FIRST NAMED APPLICANT	ATTY. DOCKET NO./TITLE
15/245,031	08/23/2016	Eric Christian Hirsch	BRAGI GmbH-P0017

CONFIRMATION NO. 1285

PUBLICATION NOTICE



OC000000089605145

133690
Goodhue, Coleman & Owens, P.C.
650 S. Prairie View Dr.
Suite 125, PMB #209
West Des Moines, IA 50266

Title:Power Control for Battery Powered Personal Area Network Device System and Method

Publication No.US-2017-0064433-A1

Publication Date:03/02/2017

NOTICE OF PUBLICATION OF APPLICATION

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

The publication may be accessed through the USPTO's publically available Searchable Databases via the Internet at www.uspto.gov. The direct link to access the publication is currently <http://www.uspto.gov/patft/>.

The publication process established by the Office does not provide for mailing a copy of the publication to applicant. A copy of the publication may be obtained from the Office upon payment of the appropriate fee set forth in 37 CFR 1.19(a)(1). Orders for copies of patent application publications are handled by the USPTO's Office of Public Records. The Office of Public Records can be reached by telephone at (571) 272-3150 or (800) 972-6382, by facsimile at (571) 273-3250, by mail addressed to the United States Patent and Trademark Office, Office of Public Records, Alexandria, VA 22313-1450 or via the Internet.

In addition, information on the status of the application, including the mailing date of Office actions and the dates of receipt of correspondence filed in the Office, may also be accessed via the Internet through the Patent Electronic Business Center at www.uspto.gov using the public side of the Patent Application Information and Retrieval (PAIR) system. The direct link to access this status information is currently <http://pair.uspto.gov/>. Prior to publication, such status information is confidential and may only be obtained by applicant using the private side of PAIR.

Further assistance in electronically accessing the publication, or about PAIR, is available by calling the Patent Electronic Business Center at 1-866-217-9197.

Office of Data Management, Application Assistance Unit (571) 272-4000, or (571) 272-4200, or 1-888-786-0101

INFORMATION DISCLOSURE STATEMENT BY APPLICANT (Not for submission under 37 CFR 1.99)	Application Number		15245031
	Filing Date		2016-08-23
	First Named Inventor	Eric Christian Hirsch	
	Art Unit	2656	
	Examiner Name		
	Attorney Docket Number	BRAGI GmbH-P0017	

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
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U.S.PATENT APPLICATION PUBLICATIONS						Remove
Examiner Initial*	Cite No	Publication Number	Kind Code ¹	Publication Date	Name of Patentee or Applicant of cited Document	Pages,Columns,Lines where Relevant Passages or Relevant Figures Appear
	1	2012309453	A1	2012-12-06	Maguire, Yael	Entire Document
	2	2014004912	A1	2014-01-02	Rajakarunanayake, Yasantha	Entire Document

If you wish to add additional U.S. Published Application citation information please click the Add button.

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FOREIGN PATENT DOCUMENTS								Remove
Examiner Initial*	Cite No	Foreign Document Number ³	Country Code ²ⁱ	Kind Code ⁴	Publication Date	Name of Patentee or Applicant of cited Document	Pages,Columns,Lines where Relevant Passages or Relevant Figures Appear	T ⁵
	1							

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NON-PATENT LITERATURE DOCUMENTS								Remove
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INFORMATION DISCLOSURE STATEMENT BY APPLICANT (Not for submission under 37 CFR 1.99)	Application Number		15245031
	Filing Date		2016-08-23
	First Named Inventor	Eric Christian Hirsch	
	Art Unit	2656	
	Examiner Name		
	Attorney Docket Number	BRAGI GmbH-P0017	

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	INTERNATIONAL SEARCH REPORT & WRITTEN OPINION, PCT/EP16/70245 (11/16/2016).	

If you wish to add additional non-patent literature document citation information please click the Add button

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	15245031
Filing Date	2016-08-23
First Named Inventor	Eric Christian Hirsch
Art Unit	2656
Examiner Name	
Attorney Docket Number	BRAGI GmbH-P0017

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 D. GOODHUE/	Date (YYYY-MM-DD)	2017-03-23
Name/Print	John D. Goodhue	Registration Number	47603

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.

PATENT COOPERATION TREATY

From the INTERNATIONAL SEARCHING AUTHORITY

PCT

To: Nilsson, Peter Dilg, Haeusler, Schindelmann Patentanwalts-gesellschaft Leonrodstrasse 58 80636 München ALLEMAGNE	DILG - HAEUSLER - SCHINDELMANN Patentanwälte GmbH 17. Nov. 2016 FRIST 16.01.2017
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**NOTIFICATION OF TRANSMITTAL OF
THE INTERNATIONAL SEARCH REPORT AND
THE WRITTEN OPINION OF THE INTERNATIONAL
SEARCHING AUTHORITY, OR THE DECLARATION**

(PCT Rule 44.1)

Applicant's or agent's file reference H 1199 WG	Date of mailing (day/month/year) 16 November 2016 (16-11-2016)
International application No. PCT/EP2015/070245	International filing date (day/month/year) 26 August 2016 (26-08-2016)
Applicant BRAGI GMBH	

1. ☒ The applicant is hereby notified that the international search report and the written opinion of the International Searching Authority have been established and are transmitted herewith.
Filing of amendments and statement under Article 19:
 The applicant is entitled, if he so wishes, to amend the claims of the International Application (see Rule 46).
When? The time limit for filing such amendments is normally two months from the date of transmittal of the International Search Report.
How? Directly to the International Bureau of WIPO, 34 chemin des Colombettes
 1211 Geneva 29, Switzerland, Facsimile No.: (41-22) 338 82.70
For more detailed instructions, see PCT Applicant's Guide, International Phase, paragraphs 9.004 - 9.011.
2. ☐ The applicant is hereby notified that no international search report will be established and that the declaration under Article 17(2)(a) to that effect and the written opinion of the International Searching Authority are transmitted herewith.
3. ☐ **With regard to any protest** against payment of (an) additional fee(s) under Rule 40.2, the applicant is notified that:
 - ☐ the protest together with the decision thereon has been transmitted to the International Bureau together with any applicant's request to forward the texts of both the protest and the decision thereon to the designated Offices.
 - ☐ no decision has been made yet on the protest; the applicant will be notified as soon as a decision is made.
4. **Reminders**
 The applicant may **submit comments on an informal basis on the written opinion of the International Searching Authority** to the International Bureau. These comments will be made available to the public after international publication. The International Bureau will send a copy of such comments to all designated Offices unless an international preliminary examination report has been or is to be established.
 Shortly after the expiration of **18 months from the priority date, the international application will be published** by the International Bureau. If the applicant wishes to avoid or postpone publication, a notice of withdrawal of the international application, or of the priority claim, must reach the International Bureau before the completion of the technical preparations for international publication (Rules 90bis.1 and 90bis.3).
 Within **19 months** from the priority date, but only in respect of some designated Offices, a demand for international preliminary examination must be filed if the applicant wishes to postpone the entry into the national phase **until 30 months** from the priority date (in some Offices even later); otherwise, the applicant must, **within 20 months** from the priority date, perform the prescribed acts for **entry into the national phase** before those designated Offices. In respect of other designated Offices, the time limit of **30 months** (or later) will apply even if no demand is filed within 19 months. For details about the applicable time limits, Office by Office, see www.wipo.int/pct/en/texts/time_limits.html and the *PCT Applicant's Guide, National Chapters*.
 Within **19 months** from the priority date, the applicant may request that a **supplementary international search** be carried out by a different International Searching Authority that offers this service (Rule 45bis.1). The procedure for requesting supplementary international search is described in the *PCT Applicant's Guide, International Phase, paragraphs 8.006-8.032*.

Name and mailing address of the International Searching Authority European Patent Office, P.B. 5818 Patentlaan 2 NL-2280 HV Rijswijk Tel: (+31-70) 340-2640 Fax: (+31-70) 340-3016	Authorized officer KOESTEL, Gilbert Tel: +31 (0)70 340-3544
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PATENT COOPERATION TREATY

PCT

INTERNATIONAL SEARCH REPORT

(PCT Article 16 and Rules 43 and 44)

Applicant's or agent's file reference H 1199 WO	FOR FURTHER ACTION see Form PCT/ISA/220 as well as, where applicable, item 5 below.	
International application No. PCT/EP2016/070245	International filing date (day/month/year) 26 August 2016 (26-08-2016)	(Earliest) Priority Date (day/month/year) 29 August 2015 (29-08-2015)
Applicant BRAGI GMBH		

This international search report has been prepared by this International Searching Authority and is transmitted to the applicant according to Article 18. A copy is being transmitted to the International Bureau.

This international search report consists of a total of 3 sheets.

☒ It is also accompanied by a copy of each prior art document cited in this report.

1. **Basis of the report**
 - a. With regard to the **language**, the international search was carried out on the basis of:

☒ the international application in the language in which it was filed
☐ a translation of the international application into _____, which is the language of a translation furnished for the purposes of international search (Rules 12.3(a) and 23.1(b))
 - b. ☐ This international search report has been established taking into account the **rectification of an obvious mistake** authorized by or notified to this Authority under Rule 91 (Rule 43.6bis(a)).
 - c. ☐ With regard to any **nucleotide and/or amino acid sequence** disclosed in the international application, see Box No. I.
2. ☐ **Certain claims were found unsearchable** (See Box No. II)
3. ☐ **Unity of invention is lacking** (see Box No III)
4. With regard to the **title**,

☒ the text is approved as submitted by the applicant
☐ the text has been established by this Authority to read as follows:
5. With regard to the **abstract**,

☒ the text is approved as submitted by the applicant
☐ the text has been established, according to Rule 36.2, by this Authority as it appears in Box No. IV. The applicant may, within one month from the date of mailing of this international search report, submit comments to this Authority
6. With regard to the **drawings**,
 - a. the figure of the **drawings** to be published with the abstract is Figure No. 1

☒ as suggested by the applicant
☐ as selected by this Authority, because the applicant failed to suggest a figure
☐ as selected by this Authority, because this figure better characterizes the invention
 - b. ☐ none of the figures is to be published with the abstract

INTERNATIONAL SEARCH REPORT

International application No.

PCT/EP2016/070245

A. CLASSIFICATION OF SUBJECT MATTER

INV. H04W52/02 H02J50/10
 ADD. H04M1/60

According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)

H04W H04M H02J

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practicable, search terms used)

EPO-Internal, WPI Data

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
A	US 2014/004912 A1 (RAJAKARUNANAYAKE YASANTHA [US]) 2 January 2014 (2014-01-02) paragraphs [0017], [0018], [0021] - [0025]	1-20
A	US 2012/309453 A1 (MAGUIRE Yael [US]) 6 December 2012 (2012-12-06) paragraphs [0020], [0051] - [0054], [0060]	1-20

☐ Further documents are listed in the continuation of Box C.

☒ See patent family annex.

* Special categories of cited documents:

"A" document defining the general state of the art which is not considered to be of particular relevance

"E" earlier application or patent but published on or after the international filing date

"L" document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified)

"O" document referring to an oral disclosure, use, exhibition or other means

"P" document published prior to the international filing date but later than the priority date claimed

"T" later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention

"X" document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone

"Y" document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art

"Z" document member of the same patent family

Date of the actual completion of the international search

9 November 2016

Date of mailing of the international search report

16/11/2016

Name and mailing address of the ISA/

European Patent Office, P.B. 5818 Patentlaan 2
 NL - 2280 HV Rijswijk
 Tel. (+31-70) 340-3040
 Fax: (+31-70) 340-3016

Authorized officer

Amorotti, M

INTERNATIONAL SEARCH REPORT

Information on patent family members

International application No

PCT/EP2016/070245

Patent document cited in search report	Publication date	Patent family member(s)	Publication date
US 2014004912 A1	02-01-2014	US 2014004912 A1	02-01-2014
		US 2016029319 A1	28-01-2016
US 2012309453 A1	06-12-2012	US 2012309453 A1	06-12-2012
		US 2013303225 A1	14-11-2013

TITLE: POWER CONTROL FOR BATTERY POWERED PERSONAL AREA NETWORK DEVICE SYSTEM
AND METHOD

APPLICANT: BRAGI GMBH

IPC CLASSIFICATION: H04W52/02, H02J50/10, H04M1/60

EXAMINER: Amorotti, M

CONSULTED DATABASES: WPI

CLASSIFICATION SYMBOLS DEFINING EXTENT OF THE SEARCH:

IPC:

CPC: H04W52/0225, H04M1/6066, H02J50/10, H02J7/025, H02J5/005

FI/F-TERMS:

KEYWORDS OR OTHER ELEMENTS FEATURING THE INVENTION:

magnetic, inductive, contactless, earpiece, headset, power charge recharge

PATENT COOPERATION TREATY

From the
INTERNATIONAL SEARCHING AUTHORITY

PCT

To:

see form PCT/ISA/220
DILG - HAEUSLER - SCHINDELMANN
Patentenwaits GmbH

17. Nov. 2016

WRITTEN OPINION OF THE INTERNATIONAL SEARCHING AUTHORITY (PCT Rule 43bis.1)

Date of mailing
(day/month/year) see form PCT/ISA/210 (second sheet)

Applicant's or agent's reference
see form PCT/ISA/220

FOR FURTHER ACTION
See paragraph 2 below

International application No.
PCT/EP2016/070245

International filing date (day/month/year)
26.08.2016

Priority date (day/month/year)
29.08.2015

International Patent Classification (IPC) or both national classification and IPC
INV. H04W52/02 H02J50/10 ADD. H04M1/60

Applicant
BRAGI GMBH

1. This opinion contains indications relating to the following items:

- ☒ Box No. I Basis of the opinion
- ☐ Box No. II Priority
- ☐ Box No. III Non-establishment of opinion with regard to novelty, inventive step and industrial applicability
- ☐ Box No. IV Lack of unity of invention
- ☒ Box No. V Reasoned statement under Rule 43bis.1(a)(i) with regard to novelty, inventive step and industrial applicability; citations and explanations supporting such statement
- ☐ Box No. VI Certain documents cited
- ☐ Box No. VII Certain defects in the international application
- ☐ Box No. VIII Certain observations on the international application

2. FURTHER ACTION

If a demand for international preliminary examination is made, this opinion will usually be considered to be a written opinion of the International Preliminary Examining Authority ("IPEA") except that this does not apply where the applicant chooses an Authority other than this one to be the IPEA and the chosen IPEA has notified the International Bureau under Rule 56.1bis(b) that written opinions of this International Searching Authority will not be so considered.

If this opinion is, as provided above, considered to be a written opinion of the IPEA, the applicant is invited to submit to the IPEA a written reply together, where appropriate, with amendments, before the expiration of 3 months from the date of mailing of Form PCT/ISA/220 or before the expiration of 22 months from the priority date, whichever expires later.

For further options, see Form PCT/ISA/220.

Name and mailing address of the ISA:



European Patent Office
P.B. 5818 Patentlaan 2
NL-2260 HV Rijswijk - Pays Bas
Tel. +31 70 340 - 2040
Fax: +31 70 340 - 3016

Date of completion of
this opinion

see form
PCT/ISA/210

Authorized Officer

Amorotli, M

Telephone No. +31 70 340-0



Box No. I Basis of the opinion

1. With regard to the **language**, this opinion has been established on the basis of:
 - ☒ the international application in the language in which it was filed.
 - ☐ a translation of the international application into , which is the language of a translation furnished for the purposes of international search (Rules 12.3(a) and 23.1 (b)).
2. ☐ This opinion has been established taking into account the **rectification of an obvious mistake** authorized by or notified to this Authority under Rule 91 (Rule 43bis.1(a)).
3. ☐ With regard to any **nucleotide and/or amino acid sequence** disclosed in the international application, this opinion has been established on the basis of a sequence listing:
 - a. ☐ forming part of the international application as filed:
 - ☐ in the form of an Annex C/ST.25 text file.
 - ☐ on paper or in the form of an image file.
 - b. ☐ furnished together with the international application under PCT Rule 13ter.1(a) for the purposes of international search only in the form of an Annex C/ST.25 text file.
 - c. ☐ furnished subsequent to the international filing date for the purposes of international search only:
 - ☐ in the form of an Annex C/ST.25 text file (Rule 13ter.1(a)).
 - ☐ on paper or in the form of an image file (Rule 13ter.1(b) and Administrative Instructions, Section 713).
4. ☐ In addition, in the case that more than one version or copy of a sequence listing has been filed or furnished, the required statements that the information in the subsequent or additional copies is identical to that forming part of the application as filed or does not go beyond the application as filed, as appropriate, were furnished.
5. Additional comments:

Box No. V Reasoned statement under Rule 43*b/s*.1(a)(i) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement

1. Statement

Novelty (N)	Yes: Claims	<u>1-20</u>
	No: Claims	
Inventive step (IS)	Yes: Claims	<u>1-20</u>
	No: Claims	
Industrial applicability (IA)	Yes: Claims	<u>1-20</u>
	No: Claims	

2. Citations and explanations

see separate sheet

Re Item V

**Reasoned statement with regard to novelty, inventive step or industrial
applicability; citations and explanations supporting such statement**

- 1 Reference is made to the following document:
D1 US 2014/004912 A1 (RAJAKARUNANAYAKE YASANTHA [US]) 2
January 2014 (2014-01-02)
- 2 D1 is regarded as being the prior art closest to the subject-matter of claim 1,
and discloses a method for managing wireless ~~earpieces~~ headphone,
comprising:
powering circuitry of the wireless earpieces utilizing a ~~high power~~
communication mode ~~in response to detecting~~ when a magnetic field is not
applied to one or more of the wireless device; and
altering the power sent to the circuitry of the wireless earpieces to a ~~low~~
~~power~~ power transfer mode ~~mode in response to detecting~~ when said
magnetic field is applied to one or more of the wireless earpieces.

The subject-matter of claim 1 therefore differs from D1 in that the two
operating modes are related to the drained powers (i.e. high and low power)
and in the step of detecting the magnetic field; it is therefore new (Article
33(2) PCT).

The problem to be solved by the present invention may be regarded as how
to automatically save energy when the wireless device are not in use.

The solution to this problem proposed in claim 1 of the present application is
considered as involving an inventive step (Article 33(3) PCT) for the following
reasons: the step of detecting an (electro)magnetic field is disclosed by D2
cited in the search report; however D2 does not discloses the power related
mode of operation (i.e. high power and low power modes); moreover the
device of D2 detects an RF field in place of a magnetic field. The skilled
person would not combine D1 and D2 to produce the difference without the
exercise of inventive activity.
- 3 In the same way claim 10 is new and inventive w.r.t. the cited prior art.

- 4 Claims 2-9, 11-20 are dependent on one or more independent claims whose subject-matter is considered as being new and inventive, as discussed above, and as such said dependent claims also meet the requirements of the PCT with respect to novelty and inventive step.
- 5 **Further Remarks**
- 5.1 Independent claims 1 and 10 are not in the two-part form in accordance with Rule 6.3(b) PCT, which in the present case would be appropriate, with those features known in combination from the prior art above cited being placed in the preamble (Rule 6.3(b)(i) PCT) and the remaining features being included in the characterising part (Rule 6.3(b)(ii) PCT).
- 5.2 The features of the claims should be provided with reference signs placed in parentheses to increase the intelligibility of the claims(Rule 6.2(b) PCT).
- 5.3 To meet the requirements of Rule 5.1(a)(ii) PCT, D1 should be identified in the description and the relevant background art disclosed therein should be briefly discussed.
- 5.4 The attention of the applicant is drawn to the fact that the application may not be amended in such a way that it contains subject-matter which extends beyond the content of the application as filed (Article 34(2)(b) PCT).

Electronic Acknowledgement Receipt

EFS ID:	28719991
Application Number:	15245031
International Application Number:	
Confirmation Number:	1285
Title of Invention:	Power Control for Battery Powered Personal Area Network Device System and Method
First Named Inventor/Applicant Name:	Eric Christian Hirsch
Customer Number:	133690
Filer:	John Darrell Goodhue/Ashlyn Nguyen
Filer Authorized By:	John Darrell Goodhue
Attorney Docket Number:	BRAGI GmbH-P0017
Receipt Date:	23-MAR-2017
Filing Date:	23-AUG-2016
Time Stamp:	15:31:25
Application Type:	Utility under 35 USC 111(a)

Payment information:

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

File Listing:

Document Number	Document Description	File Name	File Size(Bytes)/ Message Digest	Multi Part /.zip	Pages (if appl.)
1	Information Disclosure Statement (IDS) Form (SB08)	BRAGIGmbH-P0017_15245031_IDS_3-23-17.pdf	1053865 18a79f9e3878e4567a1c838ee04ae553c6f9582b	no	4

Warnings: Page 165 of 270

Information:					
2	Non Patent Literature	BRAGIGmbH- P0017PCT_PCTEP1670245_ISR- WRITTEN-OPINION_11-16-16. pdf	3456152 cf79838fc1686da3d8982d5a03b9f01741cc15ee	no	10
Warnings:					
Information:					
Total Files Size (in bytes):			4510017		
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. <u>New Applications Under 35 U.S.C. 111</u> 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. <u>National Stage of an International Application under 35 U.S.C. 371</u> 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. <u>New International Application Filed with the USPTO as a Receiving Office</u> 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.					



UNITED STATES PATENT AND TRADEMARK OFFICE

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

NOTICE OF ALLOWANCE AND FEE(S) DUE

133690 7590 05/02/2017
Goodhue, Coleman & Owens, P.C.
650 S. Prairie View Dr.
Suite 125, PMB #209
West Des Moines, IA 50266

EXAMINER

BERNARDI, BRENDA C

ART UNIT

PAPER NUMBER

2688

DATE MAILED: 05/02/2017

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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15/245,031

08/23/2016

Eric Christian Hirsch

BRAGI GmbH-P0017

1285

TITLE OF INVENTION: Power Control for Battery Powered Personal Area Network Device System and Method

APPLN. TYPE	ENTITY STATUS	ISSUE FEE DUE	PUBLICATION FEE DUE	PREV. PAID ISSUE FEE	TOTAL FEE(S) DUE	DATE DUE
nonprovisional	SMALL	\$480	\$0	\$0	\$480	08/02/2017

THE APPLICATION IDENTIFIED ABOVE HAS BEEN EXAMINED AND IS ALLOWED FOR ISSUANCE AS A PATENT. PROSECUTION ON THE MERITS IS CLOSED. THIS NOTICE OF ALLOWANCE IS NOT A GRANT OF PATENT RIGHTS. THIS APPLICATION IS SUBJECT TO WITHDRAWAL FROM ISSUE AT THE INITIATIVE OF THE OFFICE OR UPON PETITION BY THE APPLICANT. SEE 37 CFR 1.313 AND MPEP 1308.

THE ISSUE FEE AND PUBLICATION FEE (IF REQUIRED) MUST BE PAID WITHIN THREE MONTHS FROM THE MAILING DATE OF THIS NOTICE OR THIS APPLICATION SHALL BE REGARDED AS ABANDONED. THIS STATUTORY PERIOD CANNOT BE EXTENDED. SEE 35 U.S.C. 151. THE ISSUE FEE DUE INDICATED ABOVE DOES NOT REFLECT A CREDIT FOR ANY PREVIOUSLY PAID ISSUE FEE IN THIS APPLICATION. IF AN ISSUE FEE HAS PREVIOUSLY BEEN PAID IN THIS APPLICATION (AS SHOWN ABOVE), THE RETURN OF PART B OF THIS FORM WILL BE CONSIDERED A REQUEST TO REAPPLY THE PREVIOUSLY PAID ISSUE FEE TOWARD THE ISSUE FEE NOW DUE.

HOW TO REPLY TO THIS NOTICE:

I. Review the ENTITY STATUS shown above. If the ENTITY STATUS is shown as SMALL or MICRO, verify whether entitlement to that entity status still applies.

If the ENTITY STATUS is the same as shown above, pay the TOTAL FEE(S) DUE shown above.

If the ENTITY STATUS is changed from that shown above, on PART B - FEE(S) TRANSMITTAL, complete section number 5 titled "Change in Entity Status (from status indicated above)".

For purposes of this notice, small entity fees are 1/2 the amount of undiscounted fees, and micro entity fees are 1/2 the amount of small entity fees.

II. PART B - FEE(S) TRANSMITTAL, or its equivalent, must be completed and returned to the United States Patent and Trademark Office (USPTO) with your ISSUE FEE and PUBLICATION FEE (if required). If you are charging the fee(s) to your deposit account, section "4b" of Part B - Fee(s) Transmittal should be completed and an extra copy of the form should be submitted. If an equivalent of Part B is filed, a request to reapply a previously paid issue fee must be clearly made, and delays in processing may occur due to the difficulty in recognizing the paper as an equivalent of Part B.

III. All communications regarding this application must give the application number. Please direct all communications prior to issuance to Mail Stop ISSUE FEE unless advised to the contrary.

IMPORTANT REMINDER: Utility patents issuing on applications filed on or after Dec. 12, 1980 may require payment of maintenance fees. It is patentee's responsibility to ensure timely payment of maintenance fees when due.

PART B - FEE(S) TRANSMITTAL

Complete and send this form, together with applicable fee(s), to: **Mail** **Mail Stop ISSUE FEE**
Commissioner for Patents
P.O. Box 1450
Alexandria, Virginia 22313-1450
or Fax **(571)-273-2885**

INSTRUCTIONS: This form should be used for transmitting the ISSUE FEE and PUBLICATION FEE (if required). Blocks 1 through 5 should be completed where appropriate. All further correspondence including the Patent, advance orders and notification of maintenance fees will be mailed to the current correspondence address as indicated unless corrected below or directed otherwise in Block 1, by (a) specifying a new correspondence address; and/or (b) indicating a separate "FEE ADDRESS" for maintenance fee notifications.

CURRENT CORRESPONDENCE ADDRESS (Note: Use Block 1 for any change of address)

Note: A certificate of mailing can only be used for domestic mailings of the Fee(s) Transmittal. This certificate cannot be used for any other accompanying papers. Each additional paper, such as an assignment or formal drawing, must have its own certificate of mailing or transmission.

133690 7590 05/02/2017
Goodhue, Coleman & Owens, P.C.
650 S. Prairie View Dr.
Suite 125, PMB #209
West Des Moines, IA 50266

Certificate of Mailing or Transmission

I hereby certify that this Fee(s) Transmittal is being deposited with the United States Postal Service with sufficient postage for first class mail in an envelope addressed to the Mail Stop ISSUE FEE address above, or being facsimile transmitted to the USPTO (571) 273-2885, on the date indicated below.

(Depositor's name)
(Signature)
(Date)

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
15/245,031	08/23/2016	Eric Christian Hirsch	BRAGI GmbH-P0017	1285

TITLE OF INVENTION: Power Control for Battery Powered Personal Area Network Device System and Method

APPLN. TYPE	ENTITY STATUS	ISSUE FEE DUE	PUBLICATION FEE DUE	PREV. PAID ISSUE FEE	TOTAL FEE(S) DUE	DATE DUE
nonprovisional	SMALL	\$480	\$0	\$0	\$480	08/02/2017

EXAMINER	ART UNIT	CLASS-SUBCLASS
BERNARDI, BRENDA C	2688	381-074000

1. Change of correspondence address or indication of "Fee Address" (37 CFR 1.363). ☐ Change of correspondence address (or Change of Correspondence Address form PTO/SB/122) attached. ☐ "Fee Address" indication (or "Fee Address" Indication form PTO/SB/47; Rev 03-02 or more recent) attached. Use of a Customer Number is required.	2. For printing on the patent front page, list (1) The names of up to 3 registered patent attorneys or agents OR, alternatively, 1 _____ (2) The name of a single firm (having as a member a registered attorney or agent) and the names of up to 2 registered patent attorneys or agents. If no name is listed, no name will be printed. 2 _____ 3 _____
---	---

3. ASSIGNEE NAME AND RESIDENCE DATA TO BE PRINTED ON THE PATENT (print or type)

PLEASE NOTE: Unless an assignee is identified below, no assignee data will appear on the patent. If an assignee is identified below, the document has been filed for recordation as set forth in 37 CFR 3.11. Completion of this form is NOT a substitute for filing an assignment.

(A) NAME OF ASSIGNEE (B) RESIDENCE: (CITY and STATE OR COUNTRY)

Please check the appropriate assignee category or categories (will not be printed on the patent) : ☐ Individual ☐ Corporation or other private group entity ☐ Government

4a. The following fee(s) are submitted:

- ☐ Issue Fee
- ☐ Publication Fee (No small entity discount permitted)
- ☐ Advance Order - # of Copies _____

4b. Payment of Fee(s): (Please first reapply any previously paid issue fee shown above)

- ☐ A check is enclosed.
- ☐ Payment by credit card. Form PTO-2038 is attached.
- ☐ The director is hereby authorized to charge the required fee(s), any deficiency, or credits any overpayment, to Deposit Account Number _____ (enclose an extra copy of this form).

5. Change in Entity Status (from status indicated above)

- ☐ Applicant certifying micro entity status. See 37 CFR 1.29
- ☐ Applicant asserting small entity status. See 37 CFR 1.27
- ☐ Applicant changing to regular undiscounted fee status.

NOTE: Absent a valid certification of Micro Entity Status (see forms PTO/SB/15A and 15B), issue fee payment in the micro entity amount will not be accepted at the risk of application abandonment.

NOTE: If the application was previously under micro entity status, checking this box will be taken to be a notification of loss of entitlement to micro entity status.

NOTE: Checking this box will be taken to be a notification of loss of entitlement to small or micro entity status, as applicable.

NOTE: This form must be signed in accordance with 37 CFR 1.31 and 1.33. See 37 CFR 1.4 for signature requirements and certifications.

Authorized Signature _____ Date _____

Typed or printed name _____ Registration No. _____



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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
15/245,031	08/23/2016	Eric Christian Hirsch	BRAGI GmbH-P0017	1285

133690 7590 05/02/2017
Goodhue, Coleman & Owens, P.C.
650 S. Prairie View Dr.
Suite 125, PMB #209
West Des Moines, IA 50266

EXAMINER

BERNARDI, BRENDA C

ART UNIT	PAPER NUMBER
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2688

DATE MAILED: 05/02/2017

Determination of Patent Term Adjustment under 35 U.S.C. 154 (b) (Applications filed on or after May 29, 2000)

The Office has discontinued providing a Patent Term Adjustment (PTA) calculation with the Notice of Allowance.

Section 1(h)(2) of the AIA Technical Corrections Act amended 35 U.S.C. 154(b)(3)(B)(i) to eliminate the requirement that the Office provide a patent term adjustment determination with the notice of allowance. See Revisions to Patent Term Adjustment, 78 Fed. Reg. 19416, 19417 (Apr. 1, 2013). Therefore, the Office is no longer providing an initial patent term adjustment determination with the notice of allowance. The Office will continue to provide a patent term adjustment determination with the Issue Notification Letter that is mailed to applicant approximately three weeks prior to the issue date of the patent, and will include the patent term adjustment on the patent. Any request for reconsideration of the patent term adjustment determination (or reinstatement of patent term adjustment) should follow the process outlined in 37 CFR 1.705.

Any questions regarding the Patent Term Extension or Adjustment determination should be directed to the Office of Patent Legal Administration at (571)-272-7702. Questions relating to issue and publication fee payments should be directed to the Customer Service Center of the Office of Patent Publication at 1-(888)-786-0101 or (571)-272-4200.

<i>Notice Requiring Inventor's Oath or Declaration</i>	Application No. 15/245,031	Applicant(s) Eric Christian Hirsch	
	Examiner BERNARDI, BRENDA C	Art Unit 2688	

This notice is an attachment to the Notice of Allowability (PTOL-37), or the Notice of Allowability For A Design Application (PTOL-37D).

An inventor's oath or declaration in compliance with 37 CFR 1.63 or 1.64 executed by or with respect to each inventor has not yet been submitted.

An oath or declaration in compliance with 37 CFR 1.63, or a substitute statement in compliance with 37 CFR 1.64, executed by or with respect to each inventor (for any inventor for which a compliant oath, declaration, or substitute statement has not yet been submitted) **MUST** be filed no later than the date on which the issue fee is paid. See 35 U.S.C. 115(f). Failure to timely comply will result in ABANDONMENT of this application.

A properly executed inventor's oath to declaration has not been received for the following inventor(s):

If applicant previously filed one or more oaths, declarations, or substitute statements, applicant may have received an informational notice regarding deficiencies therein.

The following deficiencies are noted:

INFORMAL ACTION PROBLEMS

- A properly executed inventor's oath or declaration has not been received for the following inventor(s): **Eric Christian Hirsch** and **Peter Vincent Boesen**.

Applicant may submit the inventor's oath or declaration at any time before the Notice of Allowance and Fee(s) Due, PTOL-85, is mailed.

Questions relating to this Notice should be directed to the Application Assistance Unit at 571-272-4200.

OMB Clearance and PRA Burden Statement for PTOL-85 Part B

The Paperwork Reduction Act (PRA) of 1995 requires Federal agencies to obtain Office of Management and Budget approval before requesting most types of information from the public. When OMB approves an agency request to collect information from the public, OMB (i) provides a valid OMB Control Number and expiration date for the agency to display on the instrument that will be used to collect the information and (ii) requires the agency to inform the public about the OMB Control Number's legal significance in accordance with 5 CFR 1320.5(b).

The information collected by PTOL-85 Part B is required by 37 CFR 1.311. The information is required to obtain or retain a benefit by the public which is to file (and by the USPTO to process) an application. Confidentiality is governed by 35 U.S.C. 122 and 37 CFR 1.14. This collection is estimated to take 12 minutes to complete, including gathering, preparing, and submitting the completed application form to the USPTO. Time will vary depending upon the individual case. Any comments on the amount of time you require to complete this form and/or suggestions for reducing this burden, should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, U.S. Department of Commerce, P.O. Box 1450, Alexandria, Virginia 22313-1450. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. SEND TO: Commissioner for Patents, P.O. Box 1450, Alexandria, Virginia 22313-1450. 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.

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 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 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.

Notice of Allowability	Application No. 15/245,031	Applicant(s) HIRSCH ET AL.	
	Examiner BRENDA BERNARDI	Art Unit 2688	AIA (First Inventor to File) Status Yes

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address--

All claims being allowable, PROSECUTION ON THE MERITS IS (OR REMAINS) CLOSED in this application. If not included herewith (or previously mailed), a Notice of Allowance (PTOL-85) or other appropriate communication will be mailed in due course. **THIS NOTICE OF ALLOWABILITY IS NOT A GRANT OF PATENT RIGHTS.** This application is subject to withdrawal from issue at the initiative of the Office or upon petition by the applicant. See 37 CFR 1.313 and MPEP 1308.

1. ☒ This communication is responsive to application filed 8/23/2016.
☐ A declaration(s)/affidavit(s) under **37 CFR 1.130(b)** was/were filed on _____.
2. ☐ An election was made by the applicant in response to a restriction requirement set forth during the interview on _____; the restriction requirement and election have been incorporated into this action.
3. ☒ The allowed claim(s) is/are 1-20. As a result of the allowed claim(s), you may be eligible to benefit from the **Patent Prosecution Highway** program at a participating intellectual property office for the corresponding application. For more information, please see http://www.uspto.gov/patents/init_events/pph/index.jsp or send an inquiry to PPHfeedback@uspto.gov.
4. ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

Certified copies:

- a) ☐ All b) ☐ Some *c) ☐ None of the:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this national stage application from the International Bureau (PCT Rule 17.2(a)).

* Certified copies not received: _____.

Applicant has THREE MONTHS FROM THE "MAILING DATE" of this communication to file a reply complying with the requirements noted below. Failure to timely comply will result in ABANDONMENT of this application.

THIS THREE-MONTH PERIOD IS NOT EXTENDABLE.

5. ☐ CORRECTED DRAWINGS (as "replacement sheets") must be submitted.
☐ including changes required by the attached Examiner's Amendment / Comment or in the Office action of Paper No./Mail Date _____.
Identifying indicia such as the application number (see 37 CFR 1.84(c)) should be written on the drawings in the front (not the back) of each sheet. Replacement sheet(s) should be labeled as such in the header according to 37 CFR 1.121(d).
6. ☐ DEPOSIT OF and/or INFORMATION about the deposit of BIOLOGICAL MATERIAL must be submitted. Note the attached Examiner's comment regarding REQUIREMENT FOR THE DEPOSIT OF BIOLOGICAL MATERIAL.

Attachment(s)

- | | |
|--|--|
| 1. ☒ Notice of References Cited (PTO-892) | 5. ☐ Examiner's Amendment/Comment |
| 2. ☒ Information Disclosure Statements (PTO/SB/08),
Paper No./Mail Date _____ | 6. ☒ Examiner's Statement of Reasons for Allowance |
| 3. ☐ Examiner's Comment Regarding Requirement for Deposit
of Biological Material | 7. ☐ Other _____. |
| 4. ☐ Interview Summary (PTO-413),
Paper No./Mail Date _____. | |

/BRENDA BERNARDI/
Primary Examiner, Art Unit 2688

DETAILED ACTION

1. The present application, filed on or after March 16, 2013, is being examined under the first inventor to file provisions of the AIA.

Allowable Subject Matter

2. **Claims 1-20** are allowed. Nothing in the prior art showed or suggested the specific limitations of these claims.

The following is a statement of reasons for the indication of allowable subject matter: Prior art of Rajakarunanayake (US2014/0004912) discloses a method for managing wireless earpieces, comprising: powering circuitry of the wireless earpieces utilizing a (*high power mode*) communication mode (*in response to detecting*) when a magnetic field is not applied to one or more of the wireless earpieces; and altering the power sent to the circuitry of the wireless earpieces to a (low power mode) power transfer mode (*in response to detecting*) when a magnetic field is applied to one or more of the wireless earpieces. Prior art of Maguire (US2012/0309453) discloses detecting an RF field in place of a magnetic field. However, the prior art on record does not teach the power related mode of operation (i.e., high power and low power modes) as required in independent claim 1. Similar reasoning applies to independent claim 10 for connecting and disconnecting from a battery when a magnetic field is detected.

Any comments considered necessary by applicant must be submitted no later than the payment of the issue fee and, to avoid processing delays, should preferably accompany the issue fee. Such submissions should be clearly labeled "Comments on Statement of Reasons for Allowance."

Art Unit: 2688

Any inquiry concerning this communication or earlier communications from the examiner should be directed to BRENDA BERNARDI whose telephone number is (571)270-7125. The examiner can normally be reached on 5:30 to 2:30 M thru F.

Examiner interviews are available via telephone, in-person, and video conferencing using a USPTO supplied web-based collaboration tool. To schedule an interview, applicant is encouraged to use the USPTO Automated Interview Request (AIR) at <http://www.uspto.gov/interviewpractice>.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Wayne Young can be reached on 571 272-7582. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/BRENDA BERNARDI/

Primary Examiner, Art Unit 2688

Notice of References Cited	Application/Control No. 15/245,031		Applicant(s)/Patent Under Reexamination HIRSCH ET AL.	
	Examiner BRENDA BERNARDI		Art Unit 2688	Page 1 of 1

U.S. PATENT DOCUMENTS

*		Document Number Country Code-Number-Kind Code	Date MM-YYYY	Name	CPC Classification	US Classification
*	A	US-2006/0258412 A1	11-2006	Liu; Serina	H02J7/0044	455/575.2
*	B	US-2008/0298606 A1	12-2008	JOHNSON; Kevin M.	H04R1/1091	381/74
*	C	US-2014/0270227 A1	09-2014	Swanson; Eric J.	H04R1/1016	381/74
*	D	US-8,891,800 B1	11-2014	Shaffer; Jonathan Everett	H04R1/1025	379/437
*	E	US-9,013,145 B2	04-2015	Castillo; Armando	H02J7/0044	320/103
*	F	US-2015/0245127 A1	08-2015	Shaffer; Jonathan Everett	H04R1/1025	381/380
*	G	US-2016/0073189 A1	03-2016	Linden; Olle	H04R1/1033	381/74
	H	US-				
	I	US-				
	J	US-				
	K	US-				
	L	US-				
	M	US-				

FOREIGN PATENT DOCUMENTS

*		Document Number Country Code-Number-Kind Code	Date MM-YYYY	Country	Name	CPC Classification
	N					
	O					
	P					
	Q					
	R					
	S					
	T					

NON-PATENT DOCUMENTS

*		Include as applicable: Author, Title Date, Publisher, Edition or Volume, Pertinent Pages)
	U	
	V	
	W	
	X	

*A copy of this reference is not being furnished with this Office action. (See MPEP § 707.05(a).)
Dates in MM-YYYY format are publication dates. Classifications may be US or foreign.

Doc code: IDS

PTO/SB/08a (03-15)

Doc description: Information Disclosure Statement (IDS) Filed

Approved for use through 07/31/2016. OMB 0651-0031

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

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

INFORMATION DISCLOSURE STATEMENT BY APPLICANT (Not for submission under 37 CFR 1.99)	Application Number		15245031
	Filing Date		2016-08-23
	First Named Inventor	Eric Christian Hirsch	
	Art Unit		
	Examiner Name		
	Attorney Docket Number	BRAGI GmbH-P0017	

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	3934100	A	1976-01-20	Harada	Entire Document
	2	4150262	A	1979-04-17	Ono	Entire Document
	3	4334315	A	1982-06-08	Ono et al.	Entire Document
	4	4375016	A	1983-02-22	Harada	Entire Document
	5	4588867	A	1986-05-13	Konomi	Entire Document
	6	4654883	A	1987-03-31	Iwata	Entire Document
	7	4682180	A	1987-07-21	Gans	Entire Document
	8	4791673	A	1988-12-13	Schreiber	Entire Document

**INFORMATION DISCLOSURE
STATEMENT BY APPLICANT**
(Not for submission under 37 CFR 1.99)

Application Number	15245031
Filing Date	2016-08-23
First Named Inventor	Eric Christian Hirsch
Art Unit	
Examiner Name	
Attorney Docket Number	BRAGI GmbH-P0017

9	4865044	A	1989-09-12	Wallace et al.	Entire Document
10	5191602	A	1993-03-02	Regen et al.	Entire Document
11	5201007	A	1993-04-06	Ward et al.	Entire Document
12	5280524	A	1994-01-18	Norris	Entire Document
13	5295193	A	1994-03-15	Ono	Entire Document
14	5298692	A	1994-03-29	Ikeda et al.	Entire Document
15	5343532	A	1994-08-30	M. Wilbert Shugart	Entire Document
16	5363444	A	1994-11-08	Norris	Entire Document
17	5497339	A	1996-03-05	Bernard	Entire Document
18	5606621	A	1997-02-25	Reiter et al.	Entire Document
19	5613222	A	1997-03-18	Guenther	Entire Document

**INFORMATION DISCLOSURE
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Examiner Name		
Attorney Docket Number	BRAGI GmbH-P0017	

20	5692059	A	1997-11-25	Kruger	Entire Document
21	5721783	A	1998-02-24	Anderson	Entire Document
22	5749072	A	1998-05-05	Mazurkiewicz et al.	Entire Document
23	5771438	A	1998-06-23	Palermo et al.	Entire Document
24	5802167	A	1998-09-01	Hong	Entire Document
25	5929774	A	1999-07-27	Charlton	Entire Document
26	5933506	A	1999-08-03	Aoki et al.	Entire Document
27	5949896	A	1999-09-07	Nageno et al.	Entire Document
28	5987146	A	1999-11-16	Pluvinae et al.	Entire Document
29	6339754	B1	2002-01-15	Flanagan et al.	Entire Document
30	6021207	A	2000-02-01	Puthuff et al.	Entire Document

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32	6081724	A	2000-06-27	Wilson	Entire Document
33	6094492	A	2000-07-25	Boesen	Entire Document
34	6111569	A	2000-08-29	Brusky et al.	Entire Document
35	6112103	A	2000-08-29	Puthuff	Entire Document
36	6157727	A	2000-12-05	Rueda	Entire Document
37	6167039	A	2000-12-26	Karlsson et al.	Entire Document
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43	6542721	B2	2003-04-01	Boesen	Entire Document
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Attorney Docket Number	BRAGI GmbH-P0017

53	6823195	B1	2004-11-23	Boesen	Entire Document
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57	6920229	B2	2005-07-19	Boesen	Entire Document
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64	7463902	B2	2008-12-09	Boesen	Entire Document
65	7508411	B2	2009-03-24	Boesen	Entire Document
66	7983628	B2	2011-07-19	Boesen	Entire Document
67	8140357	B1	2012-03-20	Boesen	Entire Document
68	D464039		2002-10-08	Boesen	Entire Document
69	D468299		2003-01-07	Boesen	Entire Document
70	D468300		2003-01-07	Boesen	Entire Document

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Examiner Initial*	Cite No	Publication Number	Kind Code ¹	Publication Date	Name of Patentee or Applicant of cited Document	Pages, Columns, Lines where Relevant Passages or Relevant Figures Appear
	1	20010005197	A1	2001-06-28	Mishra et al.	Entire Document
	2	20010027121	A1	2001-10-04	Boesen	Entire Document

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3	20010056350	A1	2001-12-27	Calderone et al.	Entire Document
4	20020002413	A1	2002-01-03	Tokue	Entire Document
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6	20020010590	A1	2002-01-24	Lee	Entire Document
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Examiner Name		
Attorney Docket Number	BRAGI GmbH-P0017	

14	20030104806	A1	2003-06-05	Ruef et al.	Entire Document
15	20030115068	A1	2003-06-19	Boesen	Entire Document
16	20030125096	A1	2003-07-03	Boesen	Entire Document
17	20030218064	A1	2003-11-27	Conner et al.	Entire Document
18	20040070564	A1	2004-04-15	Dawson et al.	Entire Document
19	20040160511	A1	2004-08-19	Boesen	Entire Document
20	20050043056	A1	2005-02-24	Boesen	Entire Document
21	20050125320	A1	2005-06-09	Boesen	Entire Document
22	20050148883	A1	2005-07-07	Boesen	Entire Document
23	20050165663	A1	2005-07-28	Razumov	Entire Document
24	20050196009	A1	2005-09-08	Boesen	Entire Document

**INFORMATION DISCLOSURE
STATEMENT BY APPLICANT**
(Not for submission under 37 CFR 1.99)

Application Number	15245031
Filing Date	2016-08-23
First Named Inventor	Eric Christian Hirsch
Art Unit	
Examiner Name	
Attorney Docket Number	BRAGI GmbH-P0017

25	20050251455	A1	2005-11-10	Boesen	Entire Document
26	20050266876	A1	2005-12-01	Boesen	Entire Document
27	20060029246	A1	2006-02-09	Boesen	Entire Document
28	20060074671	A1	2006-04-06	Farmaner et al.	Entire Document
29	20060074808	A1	2006-04-06	Boesen	Entire Document
30	20080254780	A1	2008-10-16	Kuhl et al.	Entire Document

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	1	1017252	EP	A2	2000-07-05	Bybee et al.	Entire Document	
	2	2074817	GB		1981-04-11	GEN ENGINEERING	Entire Document	
	3	06292195	JP		1998-10-18	Matsushita Electric Industrial Co. LTD	Entire Document	

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4	2014043179	WO	A2	2014-03-20	RUWE et al.	Entire Document	
5	2015110577	WO	A1	2015-07-30	HVIID	Entire Document	
6	2015110587	WO	A1	2015-07-30	HVIID	Entire Document	

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	1	Announcing the \$3,333,333 Stretch Goal (02/24/2014)	
	2	BRAGI Is On Facebook (2014)	
	3	BRAGI UPDATE - Arrival Of Prototype Chassis Parts - More People - Awesomeness (5/13/2014)	
	4	BRAGI UPDATE - Chinese New Year, Design Verification, Charging Case, More People, Timeline(3/6/2015)	
	5	BRAGI UPDATE - First Sleeves From Prototype Tool - Software Development Kit (6/5/2014)	
	6	BRAGI UPDATE - Let's Get Ready To Rumble, A Lot To Be Done Over Christmas (12/22/2014)	

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7	BRAGI UPDATE - Memories From April - Update On Progress (9/16/2014)
8	BRAGI UPDATE - Memories from May - Update On Progress - Sweet (10/13/2014)
9	BRAGI UPDATE - Memories From One Month Before Kickstarter - Update On Progress (7/10/2014)
10	BRAGI UPDATE - Memories From The First Month of Kickstarter - Update on Progress (8/1/2014)
11	BRAGI UPDATE - Memories From The Second Month of Kickstarter - Update On Progress (8/22/2014)
12	BRAGI UPDATE - New People @BRAGI- Prototypes (6/26/2014)
13	BRAGI UPDATE - Office Tour, Tour To China, Tour to CES (12/11/2014)
14	BRAGI UPDATE - Status On Wireless, Bits and Pieces, Testing-Oh Yeah, Timeline(4/24/2015)
15	BRAGI UPDATE - The App Preview, The Charger, The SDK, BRAGI Funding and Chinese New Year (02/11/2015)
16	BRAGI UPDATE - What We Did Over Christmas, Las Vegas & CES (01/19/2014)
17	BRAGI UPDATE - Years of Development, Moments of Utter Joy and Finishing What We Started(6/5/2015)

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Art Unit	
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Attorney Docket Number	BRAGI GmbH-P0017

18	BRAGI UPDATE-Alpha 5 and Back To China, Backer Day, On Track(5/16/2015)
19	BRAGI UPDATE-Beta2 Production and Factory Line(8/20/2015)
20	BRAGI UPDATE-Certifications, Production, Ramping Up (11/13/2015)
21	BRAGI UPDATE-Developer Units Shipping and Status(10/05/2015)
22	BRAGI UPDATE-Developer Units Started Shipping and Status (10/19/2015)
23	BRAGI UPDATE-Developer Units, Investment, Story and Status(11/2/2015)
24	BRAGI UPDATE-Getting Close(8/6/2014)
25	BRAGI UPDATE-On Track, Design Verification, How It Works and What's Next(7/15/2015)
26	BRAGI UPDATE-On Track, On Track and Gems Overview (6/24/2015)
27	BRAGI UPDATE-Status On Wireless, Supply, Timeline and Open House@BRAGI(4/1/2015)
28	BRAGI UPDATE-Unpacking Video, Reviews On Audio Perform and Boy Are We Getting Close(9/10/2015)

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29	Last Push Before The Kickstarter Campaign Ends on Monday 4pm CET (3/28/2014)
30	STAAB, Wayne J., et al., "A One-Size Disposable Hearing Aid is Introduced", The Hearing Journal 53(4):36-41) April 2000
31	Stretchgoal - It's Your Dash (02/14/2014)
32	Stretchgoal - The Carrying Case for The Dash (02/12/2014)
33	Stretchgoal - Windows Phone Support (02/17/2014)
34	The Dash + The Charging Case & The BRAGI News (2/21/14)
35	The Dash-A Word From Our Software, Mechanical and Acoustics Team + An Update (3/11/2014)
36	Update From BRAGI - \$3,000,000 - Yipee (3/22/2014)

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Application Number	15245031		
Filing Date	2016-08-23		
First Named Inventor	Eric Christian Hirsch		
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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).

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

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Signature	/JOHN D. GOODHUE/	Date (YYYY-MM-DD)	2016-08-30
Name/Print	John D. Goodhue	Registration Number	47603

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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.
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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.
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CONFIRMATION NO. 1285

SERIAL NUMBER 15/245,031	FILING or 371(c) DATE 08/23/2016 RULE	CLASS 381	GROUP ART UNIT 2688	ATTORNEY DOCKET NO. BRAGI GmbH-P0017	
APPLICANTS BRAGI GmbH, Munchen, GERMANY; INVENTORS Eric Christian Hirsch, Munchen, GERMANY; Peter Vincent Boesen, Munchen, GERMANY; ** CONTINUING DATA ***** This appln claims benefit of 62/211,767 08/29/2015 ** FOREIGN APPLICATIONS ***** ** IF REQUIRED, FOREIGN FILING LICENSE GRANTED *** SMALL ENTITY ** 09/01/2016					
Foreign Priority claimed ☐ Yes ☒ No 35 USC 119(a-d) conditions met ☐ Yes ☒ No Verified and /BRENDA C BERNARDI/ Acknowledged Examiner's Signature	☐ Met after Allowance Initials	STATE OR COUNTRY GERMANY	SHEETS DRAWINGS 5	TOTAL CLAIMS 20	INDEPENDENT CLAIMS 2
ADDRESS Goodhue, Coleman & Owens, P.C. 650 S. Prairie View Dr. Suite 125, PMB #209 West Des Moines, IA 50266 UNITED STATES					
TITLE Power Control for Battery Powered Personal Area Network Device System and Method					
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Search Notes 	Application/Control No. 15245031	Applicant(s)/Patent Under Reexamination HIRSCH ET AL.
	Examiner BRENDA BERNARDI	Art Unit 2688

CPC- SEARCHED		
Symbol	Date	Examiner
H04R1/1041	3/31/2017	/bb/
H04W52/0225	3/31/2017	/bb/
H02J7/025	3/31/2017	/bb/
H02J7/007	3/31/2017	/bb/
H02J50/10	3/31/2017	/bb/
H04R1/1025	3/31/2017	/bb/
H04R1/028	3/31/2017	/bb/
H04R2420/07	3/31/2017	/bb/
H04M1/6066	3/31/2017	/bb/

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SEARCH NOTES		
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H04R1/1041 (text search only - see attached search history printout)	3/31/2017	/bb/
H04W52/0225 (text search only - see attached search history printout)	3/31/2017	/bb/
H02J7/025 (text search only - see attached search history printout)	3/31/2017	/bb/
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Inventor search, EAST search, google search.	3/31/2017	/bb/

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INTERFERENCE SEARCH

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Doc code: IDS

PTO/SB/08a (03-15)

Doc description: Information Disclosure Statement (IDS) Filed

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	Filing Date		2016-08-23
	First Named Inventor	Eric Christian Hirsch	
	Art Unit	2656	
	Examiner Name		
	Attorney Docket Number	BRAGI GmbH-P0017	

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Application Number	15245031		
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First Named Inventor	Eric Christian Hirsch		
Art Unit	2656		
Examiner Name			
Attorney Docket Number	BRAGI GmbH-P0017		

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	1	INTERNATIONAL SEARCH REPORT & WRITTEN OPINION, PCT/EP16/70245 (11/16/2016).	

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First Named Inventor	Eric Christian Hirsch		
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Examiner Name			
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Signature	/JOHN D. GOODHUE/	Date (YYYY-MM-DD)	2017-03-23
Name/Print	John D. Goodhue	Registration Number	47603

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EAST Search History (Prior Art)

Ref #	Hits	Search Query	DBs	Default Operator	Plurals	Time Stamp
S1	1	"15245031"	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	OFF	2017/03/07 14:33
S2	19	((("HIRSCH") near3 ("Eric"))).INV.	US-PGPUB; USPAT; USOCR	OR	OFF	2017/03/30 17:00
S3	79	((("BOESEN") near3 ("Peter"))).INV.	US-PGPUB; USPAT; USOCR	OR	OFF	2017/03/30 17:02
S4	5353	H04R1/1041.cpc.	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	OFF	2017/03/30 17:40
S5	5531	H04W52/0225.cpc.	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	OFF	2017/03/30 17:41
S6	26396	H02J7/025.cpc.	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	OFF	2017/03/30 17:41
S7	8154	H02J7/007.cpc.	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	OFF	2017/03/30 17:41
S8	4310	H02J50/10.cpc.	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	OFF	2017/03/30 17:41
S10	1249	H04R1/1025.cpc.	US-PGPUB; USPAT;	OR	OFF	2017/03/30 17:42

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S14	5997	H04M1/6066.cpc.	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	OFF	2017/03/30 17:43
S15	62601	S4 or S5 or S6 or S7 or S8 or S10 or S11 or S12 or S14	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	OFF	2017/03/30 17:43
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S21	2	"20100320961".pn.	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	OFF	2017/03/31 09:41
S22	1	(12/459466).APP.	USPAT; USOCR	OR	OFF	2017/03/31 09:41
S23	193	((wireless\$3 or wire-less\$3) near3 (earpiece or ear-piece or earbud or ear- bud)) with power\$4	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO;	OR	OFF	2017/03/31 09:46

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S25	2	("20120309453" "20140004912").PN.	US-PGPUB; USPAT	OR	OFF	2017/03/31 11:14
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S38	1	("2006/0258412").URPN.	USPAT	OR	OFF	2017/03/31 12:36
S39	14	("2008/0298606").URPN.	USPAT	OR	OFF	2017/03/31 12:37

EAST Search History (Interference)

Ref #	Hits	Search Query	DBs	Default Operator	Plurals	Time Stamp
S40	0	((((wireless\$3 or wire-less\$3) near3 (earpiece or ear-piece)) and (high\$3 near power near mode) and (detect\$4 near3 magnetic near field) and ((chang\$4 or alter\$4) near power) and (low\$3 near power near mode)).clm.	USPAT	OR	OFF	2017/03/31 13:51

3/ 31/ 2017 1:53:30 PM
C:\Users\bbernardi\Documents\EAST\Workspaces\15245031.wsp

Issue Classification 	Application/Control No. 15245031	Applicant(s)/Patent Under Reexamination HIRSCH ET AL.	
	Examiner BRENDA BERNARDI	Art Unit 2688	

CPC					
Symbol				Type	Version
H04R		1	1041	F	2013-01-01
H04W		52	0225	I	2013-01-01
H02J		7	025	I	2013-01-01
H02J		7	007	I	2013-01-01
H04R		1	028	I	2013-01-01
H04R		1	1025	I	2013-01-01
H04R		2420	07	A	2013-01-01
H04M		1	6066	A	2013-01-01
H02J		50	10	I	2016-02-01

CPC Combination Sets				
Symbol	Type	Set	Ranking	Version

NONE		Total Claims Allowed:	
		20	
(Assistant Examiner)	(Date)	O.G. Print Claim(s)	O.G. Print Figure
/BRENDA BERNARDI/ Primary Examiner.Art Unit 2688	3/31/2017	1	1
(Primary Examiner)	(Date)		

REQUEST FOR CONTINUED EXAMINATION(RCE)TRANSMITTAL (Submitted Only via EFS-Web)

Application Number	15/245,031	Filing Date	2016-08-23	Docket Number (if applicable)	BRAGI GmbH-P0017	Art Unit	2656
First Named Inventor	Eric Christian Hirsch			Examiner Name	BERNARDI, Brenda		

This is a Request for Continued Examination (RCE) under 37 CFR 1.114 of the above-identified application.

Request for Continued Examination (RCE) practice under 37 CFR 1.114 does not apply to any utility or plant application filed prior to June 8, 1995, to any international application that does not comply with the requirements of 35 U.S.C. 371, or to any design application. The Instruction Sheet for this form is located at WWW.USPTO.GOV.

SUBMISSION REQUIRED UNDER 37 CFR 1.114

Note: If the RCE is proper, any previously filed unentered amendments and amendments enclosed with the RCE will be entered in the order in which they were filed unless applicant instructs otherwise. If applicant does not wish to have any previously filed unentered amendment(s) entered, applicant must request non-entry of such amendment(s).

☐ Previously submitted. If a final Office action is outstanding, any amendments filed after the final Office action may be considered as a submission even if this box is not checked.

☐ Consider the arguments in the Appeal Brief or Reply Brief previously filed on _____

☐ Other _____

☒ Enclosed

☒ Amendment/Reply

☐ Information Disclosure Statement (IDS)

☐ Affidavit(s)/ Declaration(s)

☐ Other _____

MISCELLANEOUS

☐ Suspension of action on the above-identified application is requested under 37 CFR 1.103(c) for a period of months _____
(Period of suspension shall not exceed 3 months; Fee under 37 CFR 1.17(i) required)

☐ Other _____

FEES

The RCE fee under 37 CFR 1.17(e) is required by 37 CFR 1.114 when the RCE is filed.

☒ The Director is hereby authorized to charge any underpayment of fees, or credit any overpayments, to Deposit Account No 506801

SIGNATURE OF APPLICANT, ATTORNEY, OR AGENT REQUIRED

☒ Patent Practitioner Signature

Applicant Signature

Signature of Registered U.S. Patent Practitioner			
Signature	JOHN D. GOODHUE/	Date (YYYY-MM-DD)	2017-08-02
Name	John D. Goodhue	Registration Number	47603

This collection of information is required by 37 CFR 1.114. 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 12 minutes to complete, including gathering, preparing, and submitting the completed application form to the USPTO. Time will vary depending upon the individual case. Any comments on the amount of time you require to complete this form and/or suggestions for reducing this burden, should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, U.S. Department of Commerce, P.O. Box 1450, Alexandria, VA 22313-1450.

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 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.

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re Application of: Hirsch et al.	Confirmation No. 1285
Application No. 15/245,031	Group Art Unit: 2656
Filed: August 23, 2016	Examiner: BERNARDI, BRENDA C.
For: Power Control for Battery Powered Personal Area Network Device System and Method	

Mail Stop Amendment

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

VIA EFS-WEB

Commissioner:

AMENDMENT ACCOMPANYING REQUEST FOR CONTINUED EXAMINATION (RCE)

In reply to the Notice of Allowance mailed May 2, 2017, please amend the
above-identified application as follows:

Amendments to the Claims are reflected in the listing of claims in this paper.

Remarks follow the amendments section of this paper.

AMENDMENTS TO THE CLAIMS:

This listing of claims will replace all prior versions and listings of claims in the application:

Claim 1 (Original): A method for managing wireless earpieces, comprising:
powering circuitry of the wireless earpieces utilizing a high power mode in response to
detecting a magnetic field is not applied to one or more of the wireless earpieces;
and
altering the power sent to the circuitry of the wireless earpieces to a low power mode in
response to detecting a magnetic field is applied to one or more of the wireless
earpieces.

Claim 2 (Original): The method of claim 1, further comprising:
operating the wireless earpieces utilizing an onboard battery in response to detecting the
magnetic field is not applied to one or more of the wireless earpieces.

Claim 3 (Original): The method of claim 1, further comprising:
charging an onboard battery of the wireless earpieces in response to detecting a magnetic
field is applied to the wireless earpieces.

Claim 4 (Original): The method of claim 1, wherein the magnetic field is applied by a
magnet of a smart case configured to receive the wireless earpieces.

Claim 5 (Original): The method of claim 1, wherein the magnetic field is detected by a
reed switch of the wireless earpieces.

Claim 6 (Original): The method of claim 1, further comprising:
coupling the wireless earpieces to interfaces of a smart case, wherein the smart case
applies a magnetic field to one or more of the wireless earpieces.

Claim 7 (Original): The method of claim 1, wherein the magnetic field is detected by a
reed switch integrated in magnetic contacts that interface with a smart case for securing
the wireless earpieces.

Claim 8 (Original): The method of claim 1, further comprising:
synchronizing data between the wireless earpieces and a smart case in response to
detecting the magnetic field.

Claim 9 (Original): The method of claim 1, wherein the low power mode is a power saver
mode.

Claim 10 (Original): A wireless earpiece, comprising:
circuitry operating the wireless earpiece;
a battery powering the circuitry of the wireless earpiece; and
a reed switch connecting the battery to the circuitry, wherein the reed switch connects the
circuitry to the battery when a magnetic field is not detected, and wherein the reed
switch disconnects the circuitry from the battery when a magnetic field is detected.

Claim 11 (Original): The wireless earpiece of claim 10, wherein the magnetic field is
applied by a smart case configured to receive the wireless earpiece, and wherein the

smart case powers the wireless earpiece when received in the smart case.

Claim 12 (Original): The wireless earpiece of claim 10, further comprising:
magnetic contacts in connection with the circuitry and the battery that interface with a
smart case to charge the battery.

Claim 13 (Original): The wireless earpiece of claim 12, wherein the wireless earpiece
synchronizes data with the smart case.

Claim 14 (Original): The wireless earpiece of claim 10, wherein the wireless earpiece
alters a power level of the wireless earpiece in response to the reed switch detecting the
magnetic field.

Claim 15 (Original): The wireless earpiece of claim 10, wherein the wireless earpiece
updates software of the wireless earpiece in response to detecting the magnetic field.

Claim 16 (Original): The wireless earpiece of claim 10, wherein the circuitry includes logic
that alters a power state of the wireless earpiece in response to detecting the magnetic
field and a startup process in response to not detecting the magnetic field after having
detected the magnetic field.

Claim 17 (Original): A system comprising the wireless earpiece of claim 10, wherein the
wireless earpiece is a left earpiece and a smart case for charging the left earpiece,
the smart case comprising:

a smart case housing;

a first receptacle for receiving the left earpiece disposed within the smart case housing;
a second receptacle for receiving a right earpiece disposed within the smart case housing;
a first interface associated with the first receptacle for electrically connecting the smart case to the left earpiece;
a second interface associated with the second receptacle for electrically connecting the smart case to the right earpiece;
an intelligent control disposed within the smart case housing and operatively connected to the first interface and the second interface.

Claim 18 (Original): The system of claim 17 wherein the smart case further comprises a display.

Claim 19 (Original): The system of claim 18 wherein the display is moveably connected to the smart case to transition from a first position to a second position.

Claim 20 (Original): The system of claim 19 wherein the smart case further comprises at least one manual input for receiving user input to provide additional functionality.

21 (New): A system comprising:

a first wireless earpiece, comprising:

circuitry operating the first wireless earpiece;

a battery powering the circuitry of the first wireless earpiece; and

a switch connecting the battery to the circuitry, wherein the switch connects the circuitry to the battery when a magnetic field is not detected, and wherein the switch disconnects the circuitry from the battery when a magnetic field is detected;

a smart case for charging the first wireless earpiece and a second wireless earpiece, the smart case comprising:

a smart case housing;

a first receptacle for receiving the first wireless earpiece disposed within the smart case housing;

a second receptacle for receiving the second wireless earpiece disposed within the smart case housing;

a first interface associated with the first receptacle for electrically connecting the smart case to the first earpiece;

a second interface associated with the second receptacle for electrically connecting the smart case to the second earpiece;

an intelligent control disposed within the smart case housing and operatively connected to the first interface and the second interface.

REMARKS

The present amendment adds new claim 21. Claim 21 is similar to claim 17 (which depends from claim 10) changes include that “reed switch” has been replaced with –switch--, “left” has been replaced with –first--, “right” has been replaced with –second—, certain occurrences of “wireless earpiece” have been replaced with –first wireless earpiece--. Support should be apparent at least from the original claims.

Please charge Deposit Account 506801 for the request for continued examination (RCE), and the one additional claim over twenty. In view of the foregoing, Applicant respectfully requests reconsideration of this application and the timely allowance of the pending claims.

Please grant any extensions of time required to enter this response and charge any additional required fees to Deposit Account 506801.

Respectfully submitted,

Goodhue, Coleman & Owens, P.C.

Dated: August 2, 2017

By: /JOHN D. GOODHUE/
John D. Goodhue
Reg. No. 47603
(515) 218-7888

Electronic Patent Application Fee Transmittal

Application Number:	15245031			
Filing Date:	23-Aug-2016			
Title of Invention:	Power Control for Battery Powered Personal Area Network Device System and Method			
First Named Inventor/Applicant Name:	Eric Christian Hirsch			
Filer:	John Darrell Goodhue/Ashlyn Nguyen			
Attorney Docket Number:	BRAGI GmbH-P0017			
Filed as Small Entity				
Filing Fees for Utility under 35 USC 111(a)				
Description	Fee Code	Quantity	Amount	Sub-Total in USD(\$)
Basic Filing:				
Pages:				
Claims:				
CLAIMS IN EXCESS OF 20	2202	1	40	40
Miscellaneous-Filing:				
Petition:				
Patent-Appeals-and-Interference:				
Post-Allowance-and-Post-Issuance:				

Description	Fee Code	Quantity	Amount	Sub-Total in USD(\$)
Extension-of-Time:				
Miscellaneous:				
Total in USD (\$)				40

Electronic Acknowledgement Receipt

EFS ID:	29967075
Application Number:	15245031
International Application Number:	
Confirmation Number:	1285
Title of Invention:	Power Control for Battery Powered Personal Area Network Device System and Method
First Named Inventor/Applicant Name:	Eric Christian Hirsch
Customer Number:	133690
Filer:	John Darrell Goodhue/Ashlyn Nguyen
Filer Authorized By:	John Darrell Goodhue
Attorney Docket Number:	BRAGI GmbH-P0017
Receipt Date:	02-AUG-2017
Filing Date:	23-AUG-2016
Time Stamp:	18:17:37
Application Type:	Utility under 35 USC 111(a)

Payment information:

Submitted with Payment	yes
Payment Type	DA
Payment was successfully received in RAM	\$40
RAM confirmation Number	080317INTEFSW00005198506801
Deposit Account	506801
Authorized User	Ashlyn Nguyen

The Director of the USPTO is hereby authorized to charge indicated fees and credit any overpayment as follows:

37 CFR 1.17 (Patent application and reexamination processing fees)

Page 218 of 270

File Listing:					
Document Number	Document Description	File Name	File Size(Bytes)/ Message Digest	Multi Part /.zip	Pages (if appl.)
1	Request for Continued Examination (RCE)	BRAGIGmbH-P0017_15245031_USPTO_SB30.pdf	1364514	no	3
			735cb7f12afe24f5adaa4c3f0ff3b416b16fe036		
Warnings:					
Information:					
2		BRAGIGmbH-P0017_15245031_RCE-RESPONSE.pdf	137342	yes	7
			f99ff5d21b10990698688b7e1c0729907926a2af		
	Multipart Description/PDF files in .zip description				
	Document Description		Start	End	
	Amendment Submitted/Entered with Filing of CPA/RCE		1	1	
	Claims		2	6	
	Applicant Arguments/Remarks Made in an Amendment		7	7	
Warnings:					
Information:					
3	Fee Worksheet (SB06)	fee-info.pdf	30580	no	2
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Warnings:					
Information:					
Total Files Size (in bytes):			1532436		

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.

Electronic Patent Application Fee Transmittal

Application Number:	15245031			
Filing Date:	23-Aug-2016			
Title of Invention:	Power Control for Battery Powered Personal Area Network Device System and Method			
First Named Inventor/Applicant Name:	Eric Christian Hirsch			
Filer:	John Darrell Goodhue/Ashlyn Nguyen			
Attorney Docket Number:	BRAGI GmbH-P0017			
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Filing Fees for Utility under 35 USC 111(a)				
Description	Fee Code	Quantity	Amount	Sub-Total in USD(\$)
Basic Filing:				
Pages:				
Claims:				
Miscellaneous-Filing:				
Petition:				
Patent-Appeals-and-Interference:				
Post-Allowance-and-Post-Issuance:				
Extension-of-Time:				

Description	Fee Code	Quantity	Amount	Sub-Total in USD(\$)
Miscellaneous:				
RCE- 1st Request	2801	1	600	600
Total in USD (\$)				600

Electronic Acknowledgement Receipt

EFS ID:	29967115
Application Number:	15245031
International Application Number:	
Confirmation Number:	1285
Title of Invention:	Power Control for Battery Powered Personal Area Network Device System and Method
First Named Inventor/Applicant Name:	Eric Christian Hirsch
Customer Number:	133690
Filer:	John Darrell Goodhue/Ashlyn Nguyen
Filer Authorized By:	John Darrell Goodhue
Attorney Docket Number:	BRAGI GmbH-P0017
Receipt Date:	02-AUG-2017
Filing Date:	23-AUG-2016
Time Stamp:	18:20:59
Application Type:	Utility under 35 USC 111(a)

Payment information:

Submitted with Payment	yes
Payment Type	DA
Payment was successfully received in RAM	\$600
RAM confirmation Number	080317INTEFSW00005229506801
Deposit Account	506801
Authorized User	Ashlyn Nguyen

The Director of the USPTO is hereby authorized to charge indicated fees and credit any overpayment as follows:

37 CFR 1.21 (Miscellaneous fees and charges)

Page 223 of 270

File Listing:					
Document Number	Document Description	File Name	File Size(Bytes)/ Message Digest	Multi Part /.zip	Pages (if appl.)
1	Fee Worksheet (SB06)	fee-info.pdf	30659	no	2
			7aaa428e5ea1c056e90a876462a1b52109fde0e7		
Warnings:					
Information:					
Total Files Size (in bytes):			30659		
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. <u>New Applications Under 35 U.S.C. 111</u> 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. <u>National Stage of an International Application under 35 U.S.C. 371</u> 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. <u>New International Application Filed with the USPTO as a Receiving Office</u> 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.					

PATENT APPLICATION FEE DETERMINATION RECORD Substitute for Form PTO-875	Application or Docket Number 15/245,031	Filing Date 08/23/2016	☐ To be Mailed
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ENTITY: ☐ LARGE ☒ SMALL ☐ MICRO

APPLICATION AS FILED – PART I

(Column 1)

(Column 2)

FOR	NUMBER FILED	NUMBER EXTRA	RATE (\$)	FEE (\$)
☐ BASIC FEE (37 CFR 1.16(a), (b), or (c))	N/A	N/A	N/A	
☐ SEARCH FEE (37 CFR 1.16(k), (i), or (m))	N/A	N/A	N/A	
☐ EXAMINATION FEE (37 CFR 1.16(o), (p), or (q))	N/A	N/A	N/A	
TOTAL CLAIMS (37 CFR 1.16(i))	minus 20 =	*	X \$ =	
INDEPENDENT CLAIMS (37 CFR 1.16(h))	minus 3 =	*	X \$ =	
☐ APPLICATION SIZE FEE (37 CFR 1.16(s))	If the specification and drawings exceed 100 sheets of paper, the application size fee due is \$310 (\$155 for small entity) for each additional 50 sheets or fraction thereof. See 35 U.S.C. 41(a)(1)(G) and 37 CFR 1.16(s).			
☐ MULTIPLE DEPENDENT CLAIM PRESENT (37 CFR 1.16(j))				
* If the difference in column 1 is less than zero, enter "0" in column 2.			TOTAL	

APPLICATION AS AMENDED – PART II

(Column 1)

(Column 2)

(Column 3)

AMENDMENT	08/02/2017	CLAIMS REMAINING AFTER AMENDMENT	Minus	HIGHEST NUMBER PREVIOUSLY PAID FOR	PRESENT EXTRA	RATE (\$)	ADDITIONAL FEE (\$)
	Total (37 CFR 1.16(i))	* 21	Minus	** 20	= 1	x \$40 =	40
	Independent (37 CFR 1.16(h))	* 3	Minus	***3	= 0	x \$210 =	0
	☐ Application Size Fee (37 CFR 1.16(s))						
	☐ FIRST PRESENTATION OF MULTIPLE DEPENDENT CLAIM (37 CFR 1.16(j))						
TOTAL ADD'L FEE							40

(Column 1)

(Column 2)

(Column 3)

AMENDMENT	CLAIMS REMAINING AFTER AMENDMENT	Minus	HIGHEST NUMBER PREVIOUSLY PAID FOR	PRESENT EXTRA	RATE (\$)	ADDITIONAL FEE (\$)
	Total (37 CFR 1.16(i))	*	Minus	**	=	X \$ =
	Independent (37 CFR 1.16(h))	*	Minus	***	=	X \$ =
	☐ Application Size Fee (37 CFR 1.16(s))					
	☐ FIRST PRESENTATION OF MULTIPLE DEPENDENT CLAIM (37 CFR 1.16(j))					
TOTAL ADD'L FEE						

* If the entry in column 1 is less than the entry in column 2, write "0" in column 3.

** If the "Highest Number Previously Paid For" IN THIS SPACE is less than 20, enter "20".

*** If the "Highest Number Previously Paid For" IN THIS SPACE is less than 3, enter "3".

The "Highest Number Previously Paid For" (Total or Independent) is the highest number found in the appropriate box in column 1.

LIE
MARQUITA JONES

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

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



UNITED STATES PATENT AND TRADEMARK OFFICE

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

NOTICE OF ALLOWANCE AND FEE(S) DUE

133690 7590 08/16/2017
Goodhue, Coleman & Owens, P.C.
12951 University Ave
Suite 201
Clive, IA 50325

EXAMINER

BERNARDI, BRENDA C

ART UNIT

PAPER NUMBER

2688

DATE MAILED: 08/16/2017

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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15/245,031

08/23/2016

Eric Christian Hirsch

BRAGI GmbH-P0017

1285

TITLE OF INVENTION: Power Control for Battery Powered Personal Area Network Device System and Method

APPLN. TYPE	ENTITY STATUS	ISSUE FEE DUE	PUBLICATION FEE DUE	PREV. PAID ISSUE FEE	TOTAL FEE(S) DUE	DATE DUE
nonprovisional	SMALL	\$480	\$0	\$0	\$480	11/16/2017

THE APPLICATION IDENTIFIED ABOVE HAS BEEN EXAMINED AND IS ALLOWED FOR ISSUANCE AS A PATENT. PROSECUTION ON THE MERITS IS CLOSED. THIS NOTICE OF ALLOWANCE IS NOT A GRANT OF PATENT RIGHTS. THIS APPLICATION IS SUBJECT TO WITHDRAWAL FROM ISSUE AT THE INITIATIVE OF THE OFFICE OR UPON PETITION BY THE APPLICANT. SEE 37 CFR 1.313 AND MPEP 1308.

THE ISSUE FEE AND PUBLICATION FEE (IF REQUIRED) MUST BE PAID WITHIN THREE MONTHS FROM THE MAILING DATE OF THIS NOTICE OR THIS APPLICATION SHALL BE REGARDED AS ABANDONED. THIS STATUTORY PERIOD CANNOT BE EXTENDED. SEE 35 U.S.C. 151. THE ISSUE FEE DUE INDICATED ABOVE DOES NOT REFLECT A CREDIT FOR ANY PREVIOUSLY PAID ISSUE FEE IN THIS APPLICATION. IF AN ISSUE FEE HAS PREVIOUSLY BEEN PAID IN THIS APPLICATION (AS SHOWN ABOVE), THE RETURN OF PART B OF THIS FORM WILL BE CONSIDERED A REQUEST TO REAPPLY THE PREVIOUSLY PAID ISSUE FEE TOWARD THE ISSUE FEE NOW DUE.

HOW TO REPLY TO THIS NOTICE:

I. Review the ENTITY STATUS shown above. If the ENTITY STATUS is shown as SMALL or MICRO, verify whether entitlement to that entity status still applies.

If the ENTITY STATUS is the same as shown above, pay the TOTAL FEE(S) DUE shown above.

If the ENTITY STATUS is changed from that shown above, on PART B - FEE(S) TRANSMITTAL, complete section number 5 titled "Change in Entity Status (from status indicated above)".

For purposes of this notice, small entity fees are 1/2 the amount of undiscounted fees, and micro entity fees are 1/2 the amount of small entity fees.

II. PART B - FEE(S) TRANSMITTAL, or its equivalent, must be completed and returned to the United States Patent and Trademark Office (USPTO) with your ISSUE FEE and PUBLICATION FEE (if required). If you are charging the fee(s) to your deposit account, section "4b" of Part B - Fee(s) Transmittal should be completed and an extra copy of the form should be submitted. If an equivalent of Part B is filed, a request to reapply a previously paid issue fee must be clearly made, and delays in processing may occur due to the difficulty in recognizing the paper as an equivalent of Part B.

III. All communications regarding this application must give the application number. Please direct all communications prior to issuance to Mail Stop ISSUE FEE unless advised to the contrary.

IMPORTANT REMINDER: Utility patents issuing on applications filed on or after Dec. 12, 1980 may require payment of maintenance fees. It is patentee's responsibility to ensure timely payment of maintenance fees when due.

PART B - FEE(S) TRANSMITTAL

**Complete and send this form, together with applicable fee(s), to: Mail Mail Stop ISSUE FEE
Commissioner for Patents
P.O. Box 1450
Alexandria, Virginia 22313-1450
or Fax (571)-273-2885**

INSTRUCTIONS: This form should be used for transmitting the ISSUE FEE and PUBLICATION FEE (if required). Blocks 1 through 5 should be completed where appropriate. All further correspondence including the Patent, advance orders and notification of maintenance fees will be mailed to the current correspondence address as indicated unless corrected below or directed otherwise in Block 1, by (a) specifying a new correspondence address; and/or (b) indicating a separate "FEE ADDRESS" for maintenance fee notifications.

CURRENT CORRESPONDENCE ADDRESS (Note: Use Block 1 for any change of address)

Note: A certificate of mailing can only be used for domestic mailings of the Fee(s) Transmittal. This certificate cannot be used for any other accompanying papers. Each additional paper, such as an assignment or formal drawing, must have its own certificate of mailing or transmission.

133690 7590 08/16/2017
Goodhue, Coleman & Owens, P.C.
12951 University Ave
Suite 201
Clive, IA 50325

Certificate of Mailing or Transmission

I hereby certify that this Fee(s) Transmittal is being deposited with the United States Postal Service with sufficient postage for first class mail in an envelope addressed to the Mail Stop ISSUE FEE address above, or being facsimile transmitted to the USPTO (571) 273-2885, on the date indicated below.

(Depositor's name)
(Signature)
(Date)

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
15/245,031	08/23/2016	Eric Christian Hirsch	BRAGI GmbH-P0017	1285

TITLE OF INVENTION: Power Control for Battery Powered Personal Area Network Device System and Method

APPLN. TYPE	ENTITY STATUS	ISSUE FEE DUE	PUBLICATION FEE DUE	PREV. PAID ISSUE FEE	TOTAL FEE(S) DUE	DATE DUE
nonprovisional	SMALL	\$480	\$0	\$0	\$480	11/16/2017

EXAMINER	ART UNIT	CLASS-SUBCLASS
BERNARDI, BRENDA C	2688	381-074000

1. Change of correspondence address or indication of "Fee Address" (37 CFR 1.363). ☐ Change of correspondence address (or Change of Correspondence Address form PTO/SB/122) attached. ☐ "Fee Address" indication (or "Fee Address" Indication form PTO/SB/47; Rev 03-02 or more recent) attached. Use of a Customer Number is required.	2. For printing on the patent front page, list (1) The names of up to 3 registered patent attorneys or agents OR, alternatively, 1 _____ (2) The name of a single firm (having as a member a registered attorney or agent) and the names of up to 2 registered patent attorneys or agents. If no name is listed, no name will be printed. 2 _____ 3 _____
---	---

3. ASSIGNEE NAME AND RESIDENCE DATA TO BE PRINTED ON THE PATENT (print or type)

PLEASE NOTE: Unless an assignee is identified below, no assignee data will appear on the patent. If an assignee is identified below, the document has been filed for recordation as set forth in 37 CFR 3.11. Completion of this form is NOT a substitute for filing an assignment.

(A) NAME OF ASSIGNEE

(B) RESIDENCE: (CITY and STATE OR COUNTRY)

Please check the appropriate assignee category or categories (will not be printed on the patent) : ☐ Individual ☐ Corporation or other private group entity ☐ Government

4a. The following fee(s) are submitted:

- ☐ Issue Fee
☐ Publication Fee (No small entity discount permitted)
☐ Advance Order - # of Copies _____

4b. Payment of Fee(s): (Please first reapply any previously paid issue fee shown above)

- ☐ A check is enclosed.
☐ Payment by credit card. Form PTO-2038 is attached.
☐ The director is hereby authorized to charge the required fee(s), any deficiency, or credits any overpayment, to Deposit Account Number _____ (enclose an extra copy of this form).

5. Change in Entity Status (from status indicated above)

- ☐ Applicant certifying micro entity status. See 37 CFR 1.29
☐ Applicant asserting small entity status. See 37 CFR 1.27
☐ Applicant changing to regular undiscounted fee status.

NOTE: Absent a valid certification of Micro Entity Status (see forms PTO/SB/15A and 15B), issue fee payment in the micro entity amount will not be accepted at the risk of application abandonment.

NOTE: If the application was previously under micro entity status, checking this box will be taken to be a notification of loss of entitlement to micro entity status.

NOTE: Checking this box will be taken to be a notification of loss of entitlement to small or micro entity status, as applicable.

NOTE: This form must be signed in accordance with 37 CFR 1.31 and 1.33. See 37 CFR 1.4 for signature requirements and certifications.

Authorized Signature _____

Date _____

Typed or printed name _____

Registration No. _____



UNITED STATES PATENT AND TRADEMARK OFFICE

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

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
15/245,031	08/23/2016	Eric Christian Hirsch	BRAGI GmbH-P0017	1285
133690	7590	08/16/2017	EXAMINER	
Goodhue, Coleman & Owens, P.C.			BERNARDI, BRENDA C	
12951 University Ave			ART UNIT	
Suite 201			PAPER NUMBER	
Clive, IA 50325			2688	

DATE MAILED: 08/16/2017

Determination of Patent Term Adjustment under 35 U.S.C. 154 (b) (Applications filed on or after May 29, 2000)

The Office has discontinued providing a Patent Term Adjustment (PTA) calculation with the Notice of Allowance.

Section 1(h)(2) of the AIA Technical Corrections Act amended 35 U.S.C. 154(b)(3)(B)(i) to eliminate the requirement that the Office provide a patent term adjustment determination with the notice of allowance. See Revisions to Patent Term Adjustment, 78 Fed. Reg. 19416, 19417 (Apr. 1, 2013). Therefore, the Office is no longer providing an initial patent term adjustment determination with the notice of allowance. The Office will continue to provide a patent term adjustment determination with the Issue Notification Letter that is mailed to applicant approximately three weeks prior to the issue date of the patent, and will include the patent term adjustment on the patent. Any request for reconsideration of the patent term adjustment determination (or reinstatement of patent term adjustment) should follow the process outlined in 37 CFR 1.705.

Any questions regarding the Patent Term Extension or Adjustment determination should be directed to the Office of Patent Legal Administration at (571)-272-7702. Questions relating to issue and publication fee payments should be directed to the Customer Service Center of the Office of Patent Publication at 1-(888)-786-0101 or (571)-272-4200.

<i>Notice Requiring Inventor's Oath or Declaration</i>	Application No. 15/245,031	Applicant(s) Eric Christian Hirsch	
	Examiner BERNARDI, BRENDA C	Art Unit 2688	

This notice is an attachment to the Notice of Allowability (PTOL-37), or the Notice of Allowability For A Design Application (PTOL-37D).

An inventor's oath or declaration in compliance with 37 CFR 1.63 or 1.64 executed by or with respect to each inventor has not yet been submitted.

An oath or declaration in compliance with 37 CFR 1.63, or a substitute statement in compliance with 37 CFR 1.64, executed by or with respect to each inventor (for any inventor for which a compliant oath, declaration, or substitute statement has not yet been submitted) **MUST** be filed no later than the date on which the issue fee is paid. See 35 U.S.C. 115(f). Failure to timely comply will result in ABANDONMENT of this application.

A properly executed inventor's oath to declaration has not been received for the following inventor(s):

If applicant previously filed one or more oaths, declarations, or substitute statements, applicant may have received an informational notice regarding deficiencies therein.

The following deficiencies are noted:

INFORMAL ACTION PROBLEMS

- A properly executed inventor's oath or declaration has not been received for the following inventor(s): **Eric Christian Hirsch** and **Peter Vincent Boesen**.

Applicant may submit the inventor's oath or declaration at any time before the Notice of Allowance and Fee(s) Due, PTOL-85, is mailed.

Questions relating to this Notice should be directed to the Application Assistance Unit at 571-272-4200.

OMB Clearance and PRA Burden Statement for PTOL-85 Part B

The Paperwork Reduction Act (PRA) of 1995 requires Federal agencies to obtain Office of Management and Budget approval before requesting most types of information from the public. When OMB approves an agency request to collect information from the public, OMB (i) provides a valid OMB Control Number and expiration date for the agency to display on the instrument that will be used to collect the information and (ii) requires the agency to inform the public about the OMB Control Number's legal significance in accordance with 5 CFR 1320.5(b).

The information collected by PTOL-85 Part B is required by 37 CFR 1.311. The information is required to obtain or retain a benefit by the public which is to file (and by the USPTO to process) an application. Confidentiality is governed by 35 U.S.C. 122 and 37 CFR 1.14. This collection is estimated to take 12 minutes to complete, including gathering, preparing, and submitting the completed application form to the USPTO. Time will vary depending upon the individual case. Any comments on the amount of time you require to complete this form and/or suggestions for reducing this burden, should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, U.S. Department of Commerce, P.O. Box 1450, Alexandria, Virginia 22313-1450. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. SEND TO: Commissioner for Patents, P.O. Box 1450, Alexandria, Virginia 22313-1450. 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.

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 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 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.

Notice of Allowability	Application No. 15/245,031	Applicant(s) HIRSCH ET AL.	
	Examiner BRENDA BERNARDI	Art Unit 2688	AIA (First Inventor to File) Status Yes

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address--

All claims being allowable, PROSECUTION ON THE MERITS IS (OR REMAINS) CLOSED in this application. If not included herewith (or previously mailed), a Notice of Allowance (PTOL-85) or other appropriate communication will be mailed in due course. **THIS NOTICE OF ALLOWABILITY IS NOT A GRANT OF PATENT RIGHTS.** This application is subject to withdrawal from issue at the initiative of the Office or upon petition by the applicant. See 37 CFR 1.313 and MPEP 1308.

1. ☒ This communication is responsive to RCE filed 8/2/2017.
☐ A declaration(s)/affidavit(s) under **37 CFR 1.130(b)** was/were filed on _____.
2. ☐ An election was made by the applicant in response to a restriction requirement set forth during the interview on _____; the restriction requirement and election have been incorporated into this action.
3. ☒ The allowed claim(s) is/are 1-21. As a result of the allowed claim(s), you may be eligible to benefit from the **Patent Prosecution Highway** program at a participating intellectual property office for the corresponding application. For more information, please see http://www.uspto.gov/patents/init_events/pph/index.jsp or send an inquiry to PPHfeedback@uspto.gov.
4. ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

Certified copies:

- a) ☐ All b) ☐ Some *c) ☐ None of the:
 1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this national stage application from the International Bureau (PCT Rule 17.2(a)).

* Certified copies not received: _____.

Applicant has THREE MONTHS FROM THE "MAILING DATE" of this communication to file a reply complying with the requirements noted below. Failure to timely comply will result in ABANDONMENT of this application.

THIS THREE-MONTH PERIOD IS NOT EXTENDABLE.

5. ☐ CORRECTED DRAWINGS (as "replacement sheets") must be submitted.
☐ including changes required by the attached Examiner's Amendment / Comment or in the Office action of Paper No./Mail Date _____.
Identifying indicia such as the application number (see 37 CFR 1.84(c)) should be written on the drawings in the front (not the back) of each sheet. Replacement sheet(s) should be labeled as such in the header according to 37 CFR 1.121(d).
6. ☐ DEPOSIT OF and/or INFORMATION about the deposit of BIOLOGICAL MATERIAL must be submitted. Note the attached Examiner's comment regarding REQUIREMENT FOR THE DEPOSIT OF BIOLOGICAL MATERIAL.

Attachment(s)

- | | |
|--|--|
| 1. ☐ Notice of References Cited (PTO-892) | 5. ☒ Examiner's Amendment/Comment |
| 2. ☐ Information Disclosure Statements (PTO/SB/08),
Paper No./Mail Date _____ | 6. ☒ Examiner's Statement of Reasons for Allowance |
| 3. ☐ Examiner's Comment Regarding Requirement for Deposit
of Biological Material | 7. ☐ Other _____. |
| 4. ☐ Interview Summary (PTO-413),
Paper No./Mail Date _____. | |

/BRENDA BERNARDI/
Primary Examiner, Art Unit 2688

DETAILED ACTION

1. The present application, filed on or after March 16, 2013, is being examined under the first inventor to file provisions of the AIA.

Continued Examination Under 37 CFR 1.114

2. A request for continued examination under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(e), was filed in this application after allowance or after an Office action under *Ex Parte Quayle*, 25 USPQ 74, 453 O.G. 213 (Comm'r Pat. 1935). Since this application is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e) has been timely paid, prosecution in this application has been reopened pursuant to 37 CFR 1.114. Applicant's submission filed on 8/2/2017 has been entered.

Allowable Subject Matter

3. **Claims 1-21** are allowed. Nothing in the prior art showed or suggested the specific limitations of these claims.

The following is a statement of reasons for the indication of allowable subject matter: Prior art of Rajakarunanayake (US2014/0004912) discloses a method for managing wireless earpieces, comprising: powering circuitry of the wireless earpieces utilizing a (*high power mode*) communication mode (*in response to detecting*) when a magnetic field is not applied to one or more of the wireless earpieces; and altering the power sent to the circuitry of the wireless earpieces to a (low power mode) power transfer mode (*in response to detecting*) when a magnetic field is applied to one or more of the wireless earpieces. Prior art of Maguire (US2012/0309453) discloses detecting

Art Unit: 2688

an RF field in place of a magnetic field. However, the prior art on record does not teach the power related mode of operation (i.e., high power and low power modes) as required in independent claim 1. Similar reasoning applies to independent claims 10 and 21 for connecting and disconnecting from a battery when a magnetic field is detected.

Any comments considered necessary by applicant must be submitted no later than the payment of the issue fee and, to avoid processing delays, should preferably accompany the issue fee. Such submissions should be clearly labeled "Comments on Statement of Reasons for Allowance."

Any inquiry concerning this communication or earlier communications from the examiner should be directed to BRENDA BERNARDI whose telephone number is (571)270-7125. The examiner can normally be reached on 5:30 to 2:30 M thru F.

Examiner interviews are available via telephone, in-person, and video conferencing using a USPTO supplied web-based collaboration tool. To schedule an interview, applicant is encouraged to use the USPTO Automated Interview Request (AIR) at <http://www.uspto.gov/interviewpractice>.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Wayne Young can be reached on 571 272-7582. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/BRENDA BERNARDI/

Primary Examiner, Art Unit 2688

EAST Search History

EAST Search History (Prior Art)

Ref #	Hits	Search Query	DBs	Default Operator	Plurals	Time Stamp
S1	1	"15245031"	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	OFF	2017/03/07 14:33
S2	19	((("HIRSCH") near3 ("Eric"))).INV.	US-PGPUB; USPAT; USOCR	OR	OFF	2017/03/30 17:00
S3	79	((("BOESEN") near3 ("Peter"))).INV.	US-PGPUB; USPAT; USOCR	OR	OFF	2017/03/30 17:02
S4	5353	H04R1/1041.cpc.	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	OFF	2017/03/30 17:40
S5	5531	H04W52/0225.cpc.	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	OFF	2017/03/30 17:41
S6	26396	H02J7/025.cpc.	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	OFF	2017/03/30 17:41
S7	8154	H02J7/007.cpc.	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	OFF	2017/03/30 17:41
S8	4310	H02J50/10.cpc.	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	OFF	2017/03/30 17:41
S10	1249	H04R1/1025.cpc.	US-PGPUB; USPAT;	OR	OFF	2017/03/30 17:42

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S11	5062	H04R1/028.cpc.	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	OFF	2017/03/30 17:42
S12	8565	H04R2420/07.cpc.	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	OFF	2017/03/30 17:42
S14	5997	H04M1/6066.cpc.	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	OFF	2017/03/30 17:43
S15	62601	S4 or S5 or S6 or S7 or S8 or S10 or S11 or S12 or S14	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	OFF	2017/03/30 17:43
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S20	538	S15 and S16	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	OFF	2017/03/30 17:46
S21	2	"20100320961".pn.	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	OFF	2017/03/31 09:41
S22	1	(12/459466).APP.	USPAT; USOCR	OR	OFF	2017/03/31 09:41
S23	193	((wireless\$3 or wire-less\$3) near3 (earpiece or ear-piece or earbud or ear- bud)) with power\$4	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO;	OR	OFF	2017/03/31 09:46

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S25	2	("20120309453" "20140004912").PN.	US-PGPUB; USPAT	OR	OFF	2017/03/31 11:14
S26	1	(14/478774).APP.	USPAT; USOCR	OR	OFF	2017/03/31 11:30
S27	8	("20080181442" "20100290637" "20130238829" "20140120983" "20140166122" "20150245127" "20150350762" "8891800").PN. OR ("9532128").URPN.	US-PGPUB; USPAT; USOCR	OR	OFF	2017/03/31 11:30
S28	1	(13/829524).APP.	USPAT; USOCR	OR	OFF	2017/03/31 11:32
S29	22	("20030050011" "20040242264" "20050107120" "20050130593" "20050208893" "20060166715" "20070025194" "20070058819" "20070079692" "20070154047" "20070230736" "20080031475" "20080049961" "20080298606" "20090063975" "20100042920" "20110170703" "20130028434" "20140219467" "7206429" "7548040"	US-PGPUB; USPAT; USOCR	OR	OFF	2017/03/31 11:32

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S31	0	(11/129478).APP.	USPAT; USOCR	OR	OFF	2017/03/31 11:58
S32	9	("5333176" "5918189" "6265844" "6308074" "6760459" "6868284" "6978163" "7096048" "7110798").PN.	US-PGPUB; USPAT; USOCR	OR	OFF	2017/03/31 12:00
S33	1	(14/604082).APP.	USPAT; USOCR	OR	OFF	2017/03/31 12:09
S34	22	("20050225292" "20050255898" "20060177082" "20070032274" "20080090622" "20080090626" "20080125164" "20090296968" "20110077061" "20130083456" "20130129138" "20130148839" "20130238829" "20130265702" "7555134" "7889498" "8485404" "8891800").PN. OR ("9148717").URPN.	US-PGPUB; USPAT; USOCR	OR	OFF	2017/03/31 12:09
S35	21	("20060177082" "20080090622" "20080090626" "20090296968" "20110077061" "20130083456" "20130129138" "20130148839" "20130238829" "20130265702" "7889498" "8485404").PN. OR ("8891800").URPN.	US-PGPUB; USPAT; USOCR	OR	OFF	2017/03/31 12:19
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S37	12	("20050190936" "20060147068" "7465867" "20060093997" "20030067585" "6729726" "7289825" "20080049961" "20050202843" "5815634" "20070223721" "7496205").PN.	US-PGPUB; USPAT; USOCR	OR	OFF	2017/03/31 12:35
S38	1	("2006/0258412").URPN.	USPAT	OR	OFF	2017/03/31 12:36
S39	14	("2008/0298606").URPN.	USPAT	OR	OFF	2017/03/31 12:37
S40	5818	H04R1/1041.cpc.	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	OFF	2017/08/04 10:51
S41	5814	H04W52/0225.cpc.	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	OFF	2017/08/04 10:51
S42	28820	H02J7/025.cpc.	US-PGPUB; USPAT; USOCR; FPRS;	OR	OFF	2017/08/04 10:51

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S44	5597	H02J50/10.cpc.	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	OFF	2017/08/04 10:51
S45	1383	H04R1/1025.cpc.	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	OFF	2017/08/04 10:51
S46	5457	H04R1/028.cpc.	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	OFF	2017/08/04 10:51
S47	9239	H04R2420/07.cpc.	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	OFF	2017/08/04 10:51
S48	6156	H04M1/6066.cpc.	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	OFF	2017/08/04 10:51
S49	67879	S40 or S41 or S42 or S43 or S44 or S45 or S46 or S47 or S48	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	OFF	2017/08/04 10:51
S50	2153	(wireless\$3 or wire-less\$3) near3 (earpiece or ear-piece or earbud or ear- bud)	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	OFF	2017/08/04 10:51
S51	616	S49 and S50	US-PGPUB; USPAT;	OR	OFF	2017/08/04 10:51

			USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB			
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EAST Search History (Interference)

Ref #	Hits	Search Query	DBs	Default Operator	Plurals	Time Stamp
S52	0	(((wireless\$3 or wire-less\$3) near3 (earpiece or ear-piece)) and (high\$3 near power near mode) and (detect\$4 near3 magnetic near field) and ((chang\$4 or alter\$4) near power) and (low\$3 near power near mode)).clm.	USPAT	OR	OFF	2017/08/04 11:21

8/ 4/ 2017 11:26:33 AM
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Issue Classification 	Application/Control No. 15245031	Applicant(s)/Patent Under Reexamination HIRSCH ET AL.	
	Examiner BRENDA BERNARDI	Art Unit 2688	

CPC					
Symbol				Type	Version
H04R		1	1041	F	2013-01-01
H04W		52	0225	I	2013-01-01
H02J		7	025	I	2013-01-01
H02J		7	007	I	2013-01-01
H04R		1	028	I	2013-01-01
H04R		1	1025	I	2013-01-01
H04R		2420	07	A	2013-01-01
H04M		1	6066	A	2013-01-01
H02J		50	10	A	2016-02-01
H04W		52	0229	I	2013-01-01
H04W		52	0245	I	2013-01-01
Y02B		60	50	A	2013-01-01

CPC Combination Sets				
Symbol	Type	Set	Ranking	Version

NONE		Total Claims Allowed:	
		21	
(Assistant Examiner)	(Date)	O.G. Print Claim(s)	O.G. Print Figure
/BRENDA BERNARDI/ Primary Examiner.Art Unit 2688	8/4/2017	1	1
(Primary Examiner)	(Date)		

Search Notes 	Application/Control No. 15245031	Applicant(s)/Patent Under Reexamination HIRSCH ET AL.
	Examiner BRENDA BERNARDI	Art Unit 2688

CPC- SEARCHED		
Symbol	Date	Examiner
H04R1/1041	3/31/2017	/bb/
H04W52/0225	3/31/2017	/bb/
H02J7/025	3/31/2017	/bb/
H02J7/007	3/31/2017	/bb/
H02J50/10	3/31/2017	/bb/
H04R1/1025	3/31/2017	/bb/
H04R1/028	3/31/2017	/bb/
H04R2420/07	3/31/2017	/bb/
H04M1/6066	3/31/2017	/bb/

CPC COMBINATION SETS - SEARCHED		
Symbol	Date	Examiner

US CLASSIFICATION SEARCHED			
Class	Subclass	Date	Examiner

* See search history printout included with this form or the SEARCH NOTES box below to determine the scope of the search.

SEARCH NOTES		
Search Notes	Date	Examiner
H04R1/1041 (text search only - see attached search history printout)	3/31/2017	/bb/
H04W52/0225 (text search only - see attached search history printout)	3/31/2017	/bb/
H02J7/025 (text search only - see attached search history printout)	3/31/2017	/bb/
H02J7/007 (text search only - see attached search history printout)	3/31/2017	/bb/
H02J50/10 (text search only - see attached search history printout)	3/31/2017	/bb/
H04R1/1025 (text search only - see attached search history printout)	3/31/2017	/bb/
H04R1/028 (text search only - see attached search history printout)	3/31/2017	/bb/
H04R2420/07 (text search only - see attached search history printout)	3/31/2017	/bb/

SEARCH NOTES

Search Notes	Date	Examiner
H04M1/6066 (text search only - see attached search history printout)	3/31/2017	/bb/
Inventor search, EAST search, google search.	3/31/2017	/bb/
Additional search.	8/4/2017	/bb/

INTERFERENCE SEARCH

US Class/ CPC Symbol	US Subclass / CPC Group	Date	Examiner
	Text search for claimed subject matter in EAST US Patent and PG Publication databases. See attached search history printout.	8/4/2017	/bb/

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

Title of Invention	Power Control for Battery Powered Personal Area Network Device System and Method
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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 15/245,031
filed on 2016-08-23

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 INVENTORInventor: Eric Christian Hirsch

Date (Optional): _____

Signature: Eric Christian Hirsch

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.

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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 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 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.

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

Power Control for Battery Powered Personal Area Network Device System 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 15/245,031filed on 2016-08-23

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

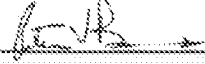
I believe that I am the original inventor or an original joint inventor of a claimed invention in the application.

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:**

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LEGAL NAME OF INVENTORInventor: Peter Vincent Boesen

Date (Optional): _____

Signature: 

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.

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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 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 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.

Electronic Acknowledgement Receipt

EFS ID:	30200931
Application Number:	15245031
International Application Number:	
Confirmation Number:	1285
Title of Invention:	Power Control for Battery Powered Personal Area Network Device System and Method
First Named Inventor/Applicant Name:	Eric Christian Hirsch
Customer Number:	133690
Filer:	John Darrell Goodhue/Ashlyn Nguyen
Filer Authorized By:	John Darrell Goodhue
Attorney Docket Number:	BRAGI GmbH-P0017
Receipt Date:	28-AUG-2017
Filing Date:	23-AUG-2016
Time Stamp:	15:37:04
Application Type:	Utility under 35 USC 111(a)

Payment information:

Submitted with Payment	no
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File Listing:

Document Number	Document Description	File Name	File Size(Bytes)/ Message Digest	Multi Part /.zip	Pages (if appl.)
1	Oath or Declaration filed	Eric_BRAGIGmbH-P0017_15245031_DEC_SIGNED_EFS.pdf	1526883 ca076bfb77c2fe985436fd41a75a1284b6a5be66	no	2

Warnings: Page 249 of 270

Information:					
2	Oath or Declaration filed	Boesen_BRAGIGmbH-P0017_15245031_DEC_signed.pdf	1532712 bc5efc00c8a8d3122aa23ab38af9bbd1fd47799	no	2
Warnings:					
Information:					
Total Files Size (in bytes):			3059595		
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. <u>New Applications Under 35 U.S.C. 111</u> 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. <u>National Stage of an International Application under 35 U.S.C. 371</u> 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. <u>New International Application Filed with the USPTO as a Receiving Office</u> 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.					

TRANSMITTAL FOR POWER OF ATTORNEY TO ONE OR MORE REGISTERED PRACTITIONERS

NOTE: This form is to be submitted with the Power of Attorney by Applicant form (PTO/AIA/82B) to identify the application to which the Power of Attorney is directed, in accordance with 37 CFR 1.5, unless the application number and filing date are identified in the Power of Attorney by Applicant form. If neither form PTO/AIA/82A nor form PTO/AIA82B identifies the application to which the Power of Attorney is directed, the Power of Attorney will not be recognized in the application.

Application Number	15/245,031
Filing Date	2016-08-23
First Named Inventor	Eric Christian Hirsch
Title	Power Control for Battery Powered Personal Area Network Device System and Method
Art Unit	2688
Examiner Name	Brenda C BERNARDI
Attorney Docket Number	BRAGI GmbH-P0017

SIGNATURE of Applicant or Patent Practitioner

Signature	/JOHN D. GOODHUE/	Date (Optional)	2017-08-29
Name	John D. Goodhue	Registration Number	47603
Title (if Applicant is a juristic entity)			
Applicant Name (if Applicant is a juristic entity)			

NOTE: This form must be signed in accordance with 37 CFR 1.33. See 37 CFR 1.4(d) for signature requirements and certifications. If more than one applicant, use multiple forms.

☐

*Total of _____ forms are submitted.

This collection of information is required by 37 CFR 1.131, 1.32, and 1.33. 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 3 minutes to complete, including gathering, preparing, and submitting the completed application form to the USPTO. Time will vary depending upon the individual case. Any comments on the amount of time you require to complete this form and/or suggestions for reducing this burden, should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, U.S. Department of Commerce, P.O. Box 1450, Alexandria, VA 22313-1450. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. **SEND TO: Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450.**

POWER OF ATTORNEY BY APPLICANT

I hereby revoke all previous powers of attorney given in the application identified in either the attached transmittal letter or the boxes below.

Application Number	Filing Date

(Note: The boxes above may be left blank if information is provided on form PTO/AIA/82A.)

☒ I hereby appoint the Patent Practitioner(s) associated with the following Customer Number as my/our attorney(s) or agent(s), and to transact all business in the United States Patent and Trademark Office connected therewith for the application referenced in the attached transmittal letter (form PTO/AIA/82A) or identified above:

133690

OR

☐ I hereby appoint Practitioner(s) named in the attached list (form PTO/AIA/82C) as my/our attorney(s) or agent(s), and to transact all business in the United States Patent and Trademark Office connected therewith for the patent application referenced in the attached transmittal letter (form PTO/AIA/82A) or identified above. (Note: Complete form PTO/AIA/82C.)

Please recognize or change the correspondence address for the application identified in the attached transmittal letter or the boxes above to:

☒ The address associated with the above-mentioned Customer Number

OR

☐ The address associated with Customer Number:

OR

Firm or Individual Name			
Address			
City	State	Zip	
Country			
Telephone	Email		

I am the Applicant (if the Applicant is a juristic entity, list the Applicant name in the box):

BRAGI GmbH

- ☐ Inventor or Joint Inventor (title not required below)
- ☐ Legal Representative of a Deceased or Legally Incapacitated Inventor (title not required below)
- ☒ Assignee or Person to Whom the Inventor is Under an Obligation to Assign (provide signer's title if applicant is a juristic entity)
- ☐ Person Who Otherwise Shows Sufficient Proprietary Interest (e.g., a petition under 37 CFR 1.46(b)(2) was granted in the application or is concurrently being filed with this document) (provide signer's title if applicant is a juristic entity)

SIGNATURE of Applicant for Patent

The undersigned (whose title is supplied below) is authorized to act on behalf of the applicant (e.g., where the applicant is a juristic entity).

Signature	<u>Peter V. Boesen</u>	Date (Optional)	
Name	Peter V. Boesen		
Title	Vice President of Intellectual Property, Bragi GmbH		

NOTE: Signature - This form must be signed by the applicant in accordance with 37 CFR 1.33. See 37 CFR 1.4 for signature requirements and certifications. If more than one applicant, use multiple forms.

Total of _____ forms are submitted.

This collection of information is required by 37 CFR 1.131, 1.32, and 1.33. 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 3 minutes to complete, including gathering, preparing, and submitting the completed application form to the USPTO. Time will vary depending upon the individual case. Any comments on the amount of time you require to complete this form and/or suggestions for reducing this burden, should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, U.S. Department of Commerce, P.O. Box 1450, Alexandria, VA 22313-1450. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. SEND TO: Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450.

Electronic Acknowledgement Receipt

EFS ID:	30214266
Application Number:	15245031
International Application Number:	
Confirmation Number:	1285
Title of Invention:	Power Control for Battery Powered Personal Area Network Device System and Method
First Named Inventor/Applicant Name:	Eric Christian Hirsch
Customer Number:	133690
Filer:	John Darrell Goodhue/Ashlyn Nguyen
Filer Authorized By:	John Darrell Goodhue
Attorney Docket Number:	BRAGI GmbH-P0017
Receipt Date:	29-AUG-2017
Filing Date:	23-AUG-2016
Time Stamp:	15:24:00
Application Type:	Utility under 35 USC 111(a)

Payment information:

Submitted with Payment	no
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File Listing:

Document Number	Document Description	File Name	File Size(Bytes)/ Message Digest	Multi Part /.zip	Pages (if appl.)
1	Power of Attorney	BRAGIGmbH-P0017_15245031_USPTO_AIA82_POA.pdf	507471	no	2
			696b395f7ac8c642a5ee7d9258f110b2c249c6b		

Warnings: Page 253 of 270

Information:	
Total Files Size (in bytes):	507471
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. <u>New Applications Under 35 U.S.C. 111</u> 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. <u>National Stage of an International Application under 35 U.S.C. 371</u> 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. <u>New International Application Filed with the USPTO as a Receiving Office</u> 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.	



UNITED STATES PATENT AND TRADEMARK OFFICE

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

APPLICATION NUMBER	FILING OR 371(C) DATE	FIRST NAMED APPLICANT	ATTY. DOCKET NO./TITLE
15/245,031	08/23/2016	Eric Christian Hirsch	BRAGI GmbH-P0017

CONFIRMATION NO. 1285

POA ACCEPTANCE LETTER



133690
Goodhue, Coleman & Owens, P.C.
12951 University Ave
Suite 201
Clive, IA 50325

Date Mailed: 08/31/2017

NOTICE OF ACCEPTANCE OF POWER OF ATTORNEY

This is in response to the Power of Attorney filed 08/29/2017.

The Power of Attorney in this application is accepted. Correspondence in this application will be mailed to the above address as provided by 37 CFR 1.33.

Questions about the contents of this notice and the requirements it sets forth should be directed to the Office of Data Management, Application Assistance Unit, at (571) 272-4000 or (571) 272-4200 or 1-888-786-0101.

/dgela/

Document Description: Issue Fee Payment (PTO-85B)

Issue Fee Transmittal Form

Application Number	Filing Date	First Named Inventor	Atty. Docket No.	Confirmation No.
15245031	23-Aug-2016	Eric Hirsch	BRAGI GmbH-P0017	1285

TITLE OF INVENTION :

Power Control for Battery Powered Personal Area Network Device System and Method

Entity Status	Application Type	Art Unit	Class - Subclass	EXAMINER
Small	Utility under 35 USC 111(a)	2667	074000	BRENDA BERNARDI
Issue Fee Due	Publication Due	Total Fee(s) Due	Date Due	Prev. Paid Fee
\$480	\$0	\$480	16-Nov-2017	\$0

1.Change of Correspondence Address and/or Indication Of Fee Address (37 CFR 1.33 & 1.363)

Current Correspondence Address:	Current Indicated Fee Address :
133690 Goodhue, Coleman & Owens, P.C. 12951 University Ave Suite 201 Clive IA 50325 UNITED STATES 515-218-7758 ~~USPTO@dockettrak.com~~	
☐ Change of correspondence address requested, system generated AIA/122-EFS form attached	☐ Fee Address indication requested, system generated SB/47-EFS form attached

2.Entity Status**Change in Entity Status**

- ☐ Applicant certifying micro entity status; system generated Micro Entity certification form attached. See 37 CFR 1.29.
Note: Absent a valid certification of micro entity status, issue fee payment in the micro entity amount will not be accepted at the risk of application abandonment.
If this box is checked, you will be prompted to choose a micro entity status on the gross income basis (37 CFR 1.29(a)) or the institution of higher education basis (37 CFR 1.29(d)), and make the applicable certification online.
- ☒ Applicant asserting small entity status. See 37 CFR 1.27.
Note: If the application was previously under micro entity status, checking this box will be taken to be a notification of loss of entitlement to micro entity status.
- ☐ Applicant changing to regular undiscounted fee status.
Note: Checking this box will be taken to be a notification of loss of entitlement to small or micro entity status, as applicable.

Document Description: Issue Fee Payment (PTO-85B)

3.The Following Fee(s) Are Submitted:

☒ Issue Fee

☐ I authorize USPTO to apply my previously paid issue fee to the current fees due

☐ Publication Fee

☐ The Director is hereby authorized to apply my previously paid issue fee to the current fee due and to charge deficient fees to Deposit Account Number _____

☐ Advance Order - # of copies _____

☐ If in **addition** to the payment of the issue fee amount submitted with this form, there are any discrepancies in any amount(s) due, the Director is authorized to charge any deficiency, or credit any overpayment, to Deposit Account Number _____.
The **issue fee must be submitted** with this form. **If payment of the issue fee does not accompany this form, checking this box and providing a deposit account number will NOT be effective to satisfy full payment of the fee(s) due.**

4.Firm and/or Attorney Names To Be Printed

NOTE: If no name is listed, no name will be printed
For printing on the patent front page, list to be displayed as entered

1. GOODHUE, COLEMAN & OWENS, P.C.
2.
3.

5.Assignee Name(s) and Residence Data To Be Printed

PLEASE NOTE: Unless an assignee is identified below, no assignee data will appear on the patent. If an assignee is identified below, the document has been filed for recordation as set forth in 37 CFR 3.11. Completion of this form is NOT a substitute for filing an assignment.

Name	City	State	Country	Category
BRAGI GmbH	München		germany	corporation

6.Signature

I certify, in accordance with 37 CFR 1.4(d)(4) that I am an attorney or agent registered to practice before the Patent and Trademark Office who has filed and has been granted power of attorney in this application. I also certify that this Fee(s) Transmittal form is being transmitted to the USPTO via EFS-WEB on the date indicated below.

Signature	/JOHN D. GOODHUE/	Date	11-02-2017
Name	John Darrell Goodhue	Registration Number	47603

Electronic Patent Application Fee Transmittal

Application Number:	15245031			
Filing Date:	23-Aug-2016			
Title of Invention:	Power Control for Battery Powered Personal Area Network Device System and Method			
First Named Inventor/Applicant Name:	Eric Christian Hirsch			
Filer:	John Darrell Goodhue/Ashlyn Nguyen			
Attorney Docket Number:	BRAGI GmbH-P0017			
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 APPL ISSUE FEE	2501	1	480	480
PUBL. FEE- EARLY, VOLUNTARY, OR NORMAL	1504	1	0	0
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 (\$)				480

Electronic Acknowledgement Receipt

EFS ID:	30843332
Application Number:	15245031
International Application Number:	
Confirmation Number:	1285
Title of Invention:	Power Control for Battery Powered Personal Area Network Device System and Method
First Named Inventor/Applicant Name:	Eric Christian Hirsch
Customer Number:	133690
Filer:	John Darrell Goodhue/Ashlyn Nguyen
Filer Authorized By:	John Darrell Goodhue
Attorney Docket Number:	BRAGI GmbH-P0017
Receipt Date:	02-NOV-2017
Filing Date:	23-AUG-2016
Time Stamp:	18:42:40
Application Type:	Utility under 35 USC 111(a)

Payment information:

Submitted with Payment	yes
Payment Type	DA
Payment was successfully received in RAM	\$ 480
RAM confirmation Number	110317INTEFSW00005306506801
Deposit Account	506801
Authorized User	Ashlyn Nguyen

The Director of the USPTO is hereby authorized to charge indicated fees and credit any overpayment as follows:

37 CFR 1.20 (Post Issuance fees)

Page 260 of 270

File Listing:					
Document Number	Document Description	File Name	File Size(Bytes)/ Message Digest	Multi Part /.zip	Pages (if appl.)
1	Issue Fee Payment (PTO-85B)	Web85b.pdf	45977	no	2
			39899b401d49909c18d4c48ffb89cd577ae07935		
Warnings:					
Information:					
2	Fee Worksheet (SB06)	fee-info.pdf	32522	no	2
			c81ab3e220001c776613c4635aa16972f17ca385		
Warnings:					
Information:					
Total Files Size (in bytes):			78499		
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. <u>New Applications Under 35 U.S.C. 111</u> 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. <u>National Stage of an International Application under 35 U.S.C. 371</u> 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. <u>New International Application Filed with the USPTO as a Receiving Office</u> 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.					



UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
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Alexandria, Virginia 22313-1450
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APPLICATION NO.	ISSUE DATE	PATENT NO.	ATTORNEY DOCKET NO.	CONFIRMATION NO.
15/245,031	12/12/2017	9843853	BRAGI GmbH-P0017	1285

133690 7590 11/21/2017
Goodhue, Coleman & Owens, P.C.
12951 University Ave
Suite 201
Clive, IA 50325

ISSUE NOTIFICATION

The projected patent number and issue date are specified above.

Determination of Patent Term Adjustment under 35 U.S.C. 154 (b) (application filed on or after May 29, 2000)

The Patent Term Adjustment is 0 day(s). Any patent to issue from the above-identified application will include an indication of the adjustment on the front page.

If a Continued Prosecution Application (CPA) was filed in the above-identified application, the filing date that determines Patent Term Adjustment is the filing date of the most recent CPA.

Applicant will be able to obtain more detailed information by accessing the Patent Application Information Retrieval (PAIR) WEB site (<http://pair.uspto.gov>).

Any questions regarding the Patent Term Extension or Adjustment determination should be directed to the Office of Patent Legal Administration at (571)-272-7702. Questions relating to issue and publication fee payments should be directed to the Application Assistance Unit (AAU) of the Office of Data Management (ODM) at (571)-272-4200.

APPLICANT(s) (Please see PAIR WEB site <http://pair.uspto.gov> for additional applicants):

BRAGI GmbH, Munchen, GERMANY;
Eric Christian Hirsch, Munchen, GERMANY;
Peter Vincent Boesen, Munchen, GERMANY;

The United States represents the largest, most dynamic marketplace in the world and is an unparalleled location for business investment, innovation, and commercialization of new technologies. The USA offers tremendous resources and advantages for those who invest and manufacture goods here. Through SelectUSA, our nation works to encourage and facilitate business investment. To learn more about why the USA is the best country in the world to develop technology, manufacture products, and grow your business, visit SelectUSA.gov.

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

PATENTEE: BRAGI GmbH
PATENT NO: 9,843,853
ISSUED: December 12, 2017
TITLE: Power Control for Battery Powered Personal Area Network Device
System and Method

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

**REQUEST FOR CERTIFICATE OF CORRECTION OF PATENT FOR PATENT
OFFICE MISTAKE**

Dear Commissioner:

It is noted that an error appears in this patent. The correct language is shown at least in the response dated August 2, 2017, claim 1, line 2. A Certificate of Correction is requested.

Attached hereto is Form PTO-1050 suitable for printing.

The exact page and line number where the error occurs in the issued patent is claim 1, line 3.

Please send the Certificate to: Goodhue, Coleman & Owens, P.C., 650 S. Prairie Dr., Suite 125 PMB209, West Des Moines, IA 50266

Please charge any fees or credit an overpayment to Deposit Account No. 506801.

Respectfully Submitted,

Dated: February 14, 2018
/JOHN D. GOODHUE/
John D. Goodhue
Reg. No. 47603

Goodhue, Coleman & Owens, P.C.
12951 University Ave, Suite 201
Clive, Iowa 50325
Tel: (515) 218-7888
Fax: (855) 877-7845

**UNITED STATES PATENT AND TRADEMARK OFFICE
CERTIFICATE OF CORRECTION**Page 1 of 1

PATENT NO. : 9,843,853

APPLICATION NO.: 15/245,031

ISSUE DATE : December 12, 2017

INVENTOR(S) : Eric Christian Hirsch and Peter Vincent Boesen

It is certified that an error appears or errors appear in the above-identified patent and that said Letters Patent is hereby corrected as shown below:

Claim 1, line 3, change "poser" to -power-

MAILING ADDRESS OF SENDER (Please do not use Customer Number below):

Goodhue, Coleman & Owens, P.C.
650 S. Prairie Dr. Suite 125 PMB209
West Des Moines, IA 50266

This collection of information is required by 37 CFR 1.322, 1.323, and 1.324. 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 1.0 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: Attention Certificate of Corrections Branch, 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.
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Electronic Acknowledgement Receipt

EFS ID:	31795641
Application Number:	15245031
International Application Number:	
Confirmation Number:	1285
Title of Invention:	Power Control for Battery Powered Personal Area Network Device System and Method
First Named Inventor/Applicant Name:	Eric Christian Hirsch
Customer Number:	133690
Filer:	John Darrell Goodhue/Ashlyn Nguyen
Filer Authorized By:	John Darrell Goodhue
Attorney Docket Number:	BRAGI GmbH-P0017
Receipt Date:	14-FEB-2018
Filing Date:	23-AUG-2016
Time Stamp:	18:00:16
Application Type:	Utility under 35 USC 111(a)

Payment information:

Submitted with Payment	no
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File Listing:

Document Number	Document Description	File Name	File Size(Bytes)/ Message Digest	Multi Part /.zip	Pages (if appl.)
1	Request for Certificate of Correction	BRAGIGmbH-P0017_15245031_RequestforCertificateofCorrectionofPatentforOfficesMistake.pdf	97766 a1776af0ed461087284f642c1c7a4313af6e194a	no	2

Warnings: Page 267 of 270

Information:					
2	Request for Certificate of Correction	BRAGIGmbH-P0017_15245031_Certificate-of-Correction.pdf	153255	no	2
			5867f6474f5e9d1f2c7b8bfb45547e9e282d2228		
Warnings:					
Information:					
Total Files Size (in bytes):			251021		
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. <u>New Applications Under 35 U.S.C. 111</u> 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. <u>National Stage of an International Application under 35 U.S.C. 371</u> 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. <u>New International Application Filed with the USPTO as a Receiving Office</u> 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.					

UNITED STATES PATENT AND TRADEMARK OFFICE
CERTIFICATE OF CORRECTION

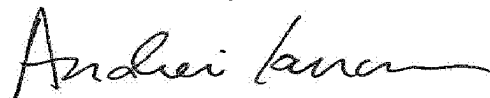
PATENT NO. : 9,843,853 B2
APPLICATION NO. : 15/245031
DATED : December 12, 2017
INVENTOR(S) : Eric Christian Hirsch and Peter Vincent Boesen

Page 1 of 1

It is certified that error appears in the above-identified patent and that said Letters Patent is hereby corrected as shown below:

Claim 1, Line 3, change “poser” to -power-

Signed and Sealed this
Thirteenth Day of March, 2018



Andrei Iancu
Director of the United States Patent and Trademark Office



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APPLICATION NUMBER	FILING OR 371(C) DATE	FIRST NAMED APPLICANT	ATTY. DOCKET NO./TITLE	REQUEST ID
15/245,031	08/23/2016	Eric Christian Hirsch	BRAGI GmbH-P0017	140671

Acknowledgement of Loss of Entitlement to Entity Status Discount

The entity status change request below filed through Private PAIR on 06/08/2021 has been accepted.

CERTIFICATIONS:

Change of Entity Status:

✕ Applicant changing to regular undiscounted fee status.

NOTE: Checking this box will be taken to be notification of loss of entitlement to small or micro entity status, as applicable.

This portion must be completed by the signatory or signatories making the entity status change in accordance with 37 CFR 1.4(d)(4).

Signature:	/JOHN D. GOODHUE/
Name:	John D. Goodhue
Registration Number:	47603