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Combing device of wireless loudhailer and Bluetooth earphone

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Abstract of CN201315619 (Y)

The utility model discloses a combing device of wireless loudhailer and Bluetooth earphone. The wireless loudhailer comprises a loudhailer, a microphone and an electric device adapted with a mobile phone; the Bluetooth earphone comprises a Bluetooth earphone, and a Bluetooth earphone bracket adapted with the external structure of the Bluetooth earphone; the Bluetooth earphone comprises the backboard of the earphone bracket, the underframe of the earphone bracket, a baffle leading the lower end of the Bluetooth earphone to be on site, and a clamping device leading the upper end of the Bluetooth earphone to be on site. The bracket part of the Bluetooth earphone is additionally arranged on the shell of the wireless loudhailer in an entire or separated mode; the lower end of the luetooth earphone and the corresponding position of the Bluetooth earphone bracket are respectively provided with a pair of electric joints. When the Bluetooth earphone is arranged on the bracket, the pair of electric joints is mutually conducted so as to charge a battery in the Bluetooth earphone.

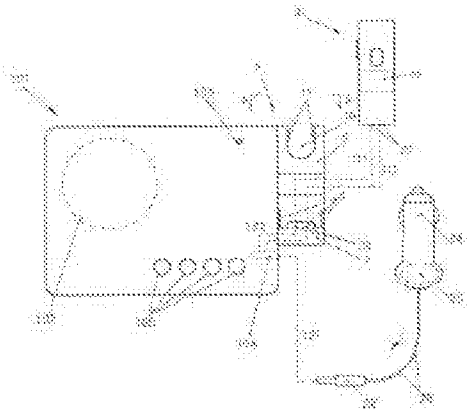

FIG. 3a

Notice

DESCRIPTION CN 201315619

A combination of a wireless speaker and a Bluetooth headset, the former comprising a speaker, a microphone and an electronic device adapted to the mobile phone; the latter comprising a Bluetooth headset and a Bluetooth earphone bracket adapted to the external structure of the Bluetooth headset, comprising a headset holder a backboard, a headphone holder, a baffle for positioning the lower end of the Bluetooth headset, and a clamping device for positioning the upper end of the Bluetooth headset; the Bluetooth earphone bracket portion is attached to the casing of the wireless speaker device in a whole or in a separate manner Above, a pair of electrical contacts are respectively disposed at a lower end of the Bluetooth earphone and a corresponding position of the Bluetooth earphone bracket. When the Bluetooth earphone is disposed on the bracket, the pair of electrical contacts are connected to each other to enable the Bluetooth headset to Charging batteries.

Combination of wireless speaker and Bluetooth headset

Field

The utility model relates to a listening and sending device matched with a mobile phone, and more particularly to a wireless speaker and a combination device of a microphone and a bluetooth earphone used together with the mobile phone.

Background technique

The use of mobile phones is very common. When using a mobile phone while driving a car, because the traffic safety requires that the driver's hand can not leave the steering wheel, people have created a Bluetooth earphone

that is used with the mobile phone, that is, a small device that is integrated with the wireless earphone and the microphone worn by the ear. Later, people created wireless speakers and microphones, which were placed in the car near the user. The advantage is that the user does not have to place a hanging object beside the ear, and others in the car can hear the incoming content. However, the advantage of the Bluetooth headset is that it is small in size and can be kept private without being used by others.

People hear. Therefore, consumers decide which one to buy, which is quite worrying.

There is no combination device of wireless speaker and Bluetooth earphone in the background art.

Utility model content

The purpose of the utility model is to design a combination device of a wireless speaker and a Bluetooth earphone, the combination device comprising a wireless speaker device part and a Bluetooth earphone and a bracket part thereof, the wireless speaker device comprising a wireless speaker, a microphone and a mobile phone. The electronic device, the Bluetooth headset and the bracket portion thereof comprise a Bluetooth earphone and a Bluetooth earphone bracket adapted to an external structure of the Bluetooth earphone, the bracket comprises a headphone backplane, a headphone holder bottom, and the lower end of the Bluetooth earphone is in place a baffle plate, a clamping device for positioning the upper end of the Bluetooth earphone, the Bluetooth earphone bracket portion being attached to the casing of the wireless speaker device, and configured to receive a 12V/24V DC power supply on the car and change to a power supply device suitable for the speaker device and a voltage required by the Bluetooth headset, and a corresponding pair of electrical contacts at a lower end of the Bluetooth headset and a corresponding position of the Bluetooth headset holder, when the Bluetooth headset is disposed on the bracket. The pair of electrical contacts are connected to each other to charge the battery in the Bluetooth headset.

In the combination of the wireless speaker and the Bluetooth earphone of the present invention, the Bluetooth earphone holder is attached to the casing of the wireless speaker device in a manufacturing manner.

In the combination of the wireless speaker and the Bluetooth earphone of the present invention, the Bluetooth earphone holder is attached to the casing of the wireless speaker device in a manufacturing body, attachable or detachable.

The combination device of the wireless speaker and the Bluetooth earphone of the present invention is provided

with a fixing head at a near upper end of the Bluetooth earphone bracket, and a space of the package head is provided with a pair of male pins or female sockets, and the wireless speaker a fixing socket adapted to the fixing head is disposed at an upper left corner or an upper right corner of the device, and a pair of female sockets or male pins are disposed in the fixing socket, and the sockets/pins in the fixing head and the fixing socket are mutual A dapted.

The wireless speaker and the Bluetooth earphone combination device of the present invention, the lower end of the Bluetooth earphone bracket is provided with a USB male interface, a pair of power contacts in the USB male interface and a pair of electrical contacts on the Bluetooth earphone bracket are via plastic The component is internally turned on.

The combination device of the wireless speaker and the Bluetooth earphone of the present invention, one side of the Bluetooth earphone holder is provided with a tab having a trapezoidal cross section, and the tab is disposed on the left side or the right side of the wireless speaker device The matching slot is provided with a pair of electrical contacts which can be connected to the power source, which are respectively adapted to the position, shape and size of the insert and the outer surface of the slot.

The wireless speaker and the Bluetooth earphone combination device of the present invention, the lower end of the Bluetooth earphone bracket is provided with a USB male interface, a pair of power contacts in the USB male interface and a pair of electrical contacts on the Bluetooth earphone bracket are via plastic The component is internally turned on.

The combination device of the wireless speaker and the bluetooth earphone of the present invention, the power source of the voltage device suitable for the speaker device and the bluetooth earphone is firstly passed into the speaker device part, and then the inside of the plastic component thereof The wires are connected and connected in parallel to the Bluetooth earphone holder portion.

The combination device of the wireless speaker and the bluetooth earphone of the present invention, the power source suitable for the voltage of the speaker device and the bluetooth earphone obtained by the power supply device is firstly connected to the Bluetooth earphone bracket part, and then the inside of the plastic component thereof The connecting wires are connected in parallel to the speaker device portion.

The combination of the wireless speaker and the Bluetooth earphone of the present invention, the DC power supply on the automobile is a 12V/24V DC power supply.

The combination device of the wireless speaker and the bluetooth earphone of the utility model is provided with a bracket for locating a bluetooth earphone based on the wireless speaker (and the transmitting microphone) , so that the bluetooth earphone can be stored in the bracket when not in use. O n the top, it is also possible to charge the Bluetooth headset for the stand. Therefore, the consumer can have both at once, and the cost must be lower than the sum of the two.

DRAWINGS

1 is a schematic illustration of a known separate wireless speaker device.

2(a) to 2(d) are schematic views of a known Bluetooth headset. 2(a) is a rear view of a known Bluetooth headset (without the earphone neck and the side of the earpiece) , Figure 2(b) is a front view of a known Bluetooth headset, and Figure 2(c) is already A side view of a known Bluetooth headset, Figure 2(d) is a bottom view of a known Bluetooth headset.

3(a) to 3(d) are schematic views of the combination device of the wireless speaker and the Bluetooth earphone of the present invention (both of which are combined in a unitary manner) . 3(a) is a front view of the combination device of the wireless speaker and the Bluetooth earphone of the present invention, and FIG . 3(b) is a side view of the combination device of the wireless speaker and the Bluetooth earphone of the present invention, FIG . (c) is a partial top view of the combination device of the wireless speaker and the Bluetooth earphone of the present invention, and FIG . 3(d) is a rear view of the combination device of the wireless speaker and the Bluetooth earphone of the present invention.

4(a) and 4(c) are schematic views showing a combination of a wireless speaker and a Bluetooth earphone of the present invention which is constructed in one of the split modes. 4(a) is a schematic view showing the provision of a fixing socket at an upper corner of the wireless speaker device. Fig. 4(b) is a schematic view showing a fixing head provided on the upper portion of the Bluetooth earphone holder. Fig. 4(c) is a B- B view in Fig. 4(b) .

Fig. 5 (a) and Fig. 5 (b) are schematic diagrams showing the combination of the wireless speaker and the Bluetooth earphone of the present invention which is constructed in a split mode. H ere, Fig. 5(a) is a schematic view showing a slot provided in an upper corner of the wireless speaker device 101". Fig. 5(b) is a schematic view showing the insertion of a tab on one side of the Bluetooth earphone holder 5".

Fig. 6(a) and Fig. 6(b) are schematic diagrams showing the combination of the wireless speaker and the Bluetooth earphone of the present invention constructed by another aspect of the split mode. Here, Fig. 6(a) is a schematic view showing the modification of the Bluetooth earphone holder 5' of Fig. 4(b). Fig. 6(b) is a schematic view showing the modification of the Bluetooth earphone holder 5" of Fig. 5(b).

detailed description

The utility model designs a combination device of a wireless speaker device and a Bluetooth earphone, the combination device comprising a wireless speaker device part and a Bluetooth earphone and a bracket part thereof, the wireless speaker device comprising a wireless speaker, a microphone (transmitting microphone) and An electronic device adapted to the mobile phone, the Bluetooth earphone and the bracket portion thereof comprise a Bluetooth earphone and a Bluetooth earphone bracket adapted to an external structure of the Bluetooth earphone, the bracket comprises a headphone backplane, a headphone holder, and a Bluetooth headset a baffle plate at the lower end, a clamping device for positioning the upper end of the Bluetooth earphone, the Bluetooth earphone bracket portion being attached to the casing of the wireless speaker device in a whole or in a separate manner, and configured to pick up the car The 12V/24V DC power supply is switched to a power supply device suitable for the voltage required by the speaker device and the Bluetooth headset, and a pair of electrical contacts are respectively arranged at the lower end of the Bluetooth headset and the corresponding position of the Bluetooth earphone bracket. When the Bluetooth earphone is disposed on the bracket, the pair of electrical contacts are connected to each other to make the electricity in the Bluetooth headset Charge.

1 is a schematic illustration of an existing separate wireless speaker device 100. Reference numeral 102 denotes a speaker provided in the casing, 103 is a microphone (transmitting microphone), 104 is a jack for receiving power, and 105 is a plurality of operation buttons or indicator lamps (the number and position thereof may vary depending on different designs). The electronic device necessary for it is disposed inside the casing, and is omitted. Reference numeral 24 is a plug that is plugged from a 12V/24V DC power supply in the car, and 25 is a conversion device provided therein for converting the power source into a voltage required for the wireless speaker device and the Bluetooth headset (this device is provided with the plug 24 in the figure) Together, they can also be set separately or in a wireless speaker device (not shown), 26 is a wire that leads to the power supply, and 22' is an electrical plug that is guided by the dotted line 121 and inserted into the jack 104. After the user enables the mobile phone to make a call or answer the incoming call, the speaker device is activated, and the speaker 102 can answer the incoming call, and the microphone 103 sends the user's voice to the other party.

2(a) to 2(d) are schematic views of the Bluetooth earphone 31 (an example of which is a model). Figure 2 (a) is a back view (without the earphone neck and the side of the earpiece), Figure 2 (b) is a front view, Figure 2 (c) is a side view, reference numeral 32 is its body, 33 is the earphone neck, 34 is the head of the earpiece, 36 is a plurality of operation buttons or indicator lights (the number and position of which may vary depending on the design),

FIG. 2(d) is a bottom view, and reference numeral 20' denotes a pair of electrical contacts provided at the bottom thereof, for charging the battery installed in it.

3(a) to 3(d) are a combination device 101 of the wireless speaker device, the Bluetooth earphone and the bracket thereof of the present invention. Figure 3(a) is a front view, 3(b) is a side view, 3(c) is a partial top view, 3(d) is a back view, and the reference numeral 5 is a Bluetooth that is integrally disposed on the right side of the casing of the wireless speaker device The earphone holder (it is self-evident that it can also be placed at other positions of the casing, for example, on the left side, not shown in the drawing). Reference numeral 6 is a back plate of the bracket 5, reference numeral 7 is a bottom support for holding the bottom of the blue earphone 31, and reference numeral 8 is a baffle for receiving the bottom of the Bluetooth earphone 31 (here, it is composed of three small pieces, and may be other configurations. Not shown in the figure), reference numeral 10 is a gap in the upper part of the Bluetooth earphone holder for receiving the earphone ear neck 33 of the Bluetooth earphone, and reference numeral 11 is an elastic clip disposed in the gap for clamping the earphone neck 33, 20 is a pair of electrical contacts provided on the base 7 of the Bluetooth earphone holder 31, the position and configuration of which are adapted to the pair of electrical contacts 20' at the bottom of the blue earphone of the holder. As indicated by the dotted lines 111 and 112, after the Bluetooth earphone 31 is inserted into the bracket 5, the earphone neck 33 enters the gap 10, is clamped and fixed by the elastic clip 11, and the electrical contact 20' is in contact with the electrical contact 20. Turned on, the battery in the Bluetooth headset 31 is charged. As shown by the broken line 122, the power source obtained by the power receiving jack 104 is used as a power source for the wireless poppet device, and a pair of parallel plastic components are internally connected to the pair of wires on the bottom bracket 7 of the Bluetooth earphone holder 5. The contact 20 is for charging the Bluetooth headset 31.

As shown in Fig. 3(a), the power receiving jack 104 is provided on the casing of the wireless speaker device. The power source is first passed through, and the wire inside the plastic member is connected to the electrical contact 20 of the Bluetooth earphone holder 5. The power inlet jack 104 can also be disposed at the bottom (or back) of the Bluetooth earphone bracket 5. After the power source is passed therethrough, the power wire inside the plastic component is connected to the wireless speaker device, which is not shown in the figure. the way. Reference numeral 106 is the four strap loops provided behind the wireless speaker unit for passing the strap therethrough and securing the assembly to a suitable position in the vehicle, such as the front window sun visor.

Bluetooth headsets are small in size, and consumers often encounter an annoyance when they use them. After use, they often leave their hands and can't find it when they need it next time. With the combination device of the present invention, it can be fixed on the Bluetooth earphone bracket when the Bluetooth earphone is not used, and can be charged to full at any time, and can be obtained by reaching out when it is needed, which is convenient.

An additional feature of the present embodiment is that the Bluetooth earphone holder is attached to the casing of the wireless speaker device in a manufacturing manner; the power supply device is suitable for the speaker device and the Bluetooth headset. The voltage source is first passed into the speaker device portion, and is connected in parallel to the Bluetooth earphone holder portion by a connecting wire inside the plastic member; the power supply device is suitable for the speaker device and the Bluetooth headset. The voltage source is first passed into the Bluetooth earphone holder portion and then connected in parallel to the speaker device portion by a connecting wire inside the plastic member.

The above embodiment is in which the Bluetooth earphone holder portion and the wireless speaker device portion are integrally formed. The following schemes are split.

4(a) and 4(b) are one of the split modes, and FIG. 4(a) shows an upper corner of the wireless speaker device 101' (the upper right corner or the upper left corner is shown in the figure, In the figure, a fixing socket 68 is provided, in which a pair of male pins 69 (as shown in the figure) or female sockets 67 (not shown) are provided. 4(b) is a fixed head 66 provided on the upper portion of the Bluetooth earphone holder 5', in which a pair of female jacks 67 (as shown in the figure) or male pins 69 (not shown) are provided.). A pair of female jacks 67 and a pair of electrical contacts 20 for charging the Bluetooth headset are connected through the interior of the plastic member. 4(c) shows the modified Bluetooth earphone holder back plate shown as reference numeral 6'. When the fixing head 66 is inserted into the fixing socket 68, the Bluetooth earphone holder 5' is attached to the wireless speaker device 101'. When integrated, a pair of male pins 69 are inserted into a pair of female jacks 67 to turn on the power. Fig. 4(c) is a B-B view of Fig. 4(b) showing the bottom surface of the fixing head 66 and the female insertion hole 67. The rest of the figures in the figure have the same meaning as before.

Figures 5(a) and 5(b) are another split mode. Figure 5(a) shows a slot 131 in an upper corner of the wireless speaker device 101" (shown in the upper right corner, but also in the upper left corner, not shown), and a slot 131 is provided on the outside. For the electrical contact 20"'. Figure 5(b) shows a tab 130 on one side of the Bluetooth earphone holder 5", the tab having a trapezoidal cross-section and adapted to the cross-section of the slot 131 for insertion and secure attachment thereto. On the outside of the tab 130 there is a pair of electrical contacts 20" which are connected to the pair of electrical contacts 20 for charging the Bluetooth headset via the plastic member. Reference numeral 6" is a modified back plate. The shapes and positions of the electrical contacts 20" and 20"' cooperate with each other, and after the tabs 130 of the Bluetooth earphone holder 5" are inserted into the slots 131 of the wireless speaker device 101", the power can be turned on each other. The rest of the figures in the figure have the same meaning as before.

An additional feature of the present embodiment is that the Bluetooth earphone holder is attached to the casing of the wireless speaker device in a manufacturing body, attachable or detachable; in the Bluetooth earphone bracket a fixing head is disposed on the upper end, and a space of the package is provided with a pair of male pins

or female sockets, and a fixing socket corresponding to the fixing head is disposed at an upper left corner or an upper right corner of the wireless speaker device. A pair of female jacks or male pins are disposed in the fixing socket, and the fixing head and the jack/pin in the fixing socket are mutually adapted; one side of the Bluetooth earphone bracket is provided with a trapezoidal cross section a slot adapted to the tab on the left or right side of the wireless speaker device, and the position, shape and size of the insert and the outer surface of the slot are respectively adapted to each other. A pair of electrical contacts that are powered on.

In another embodiment, a USB male interface is added to the bottom of the Bluetooth earphone bracket based on the above split mode solution. Therefore, when the Bluetooth earphone bracket is not attached to the casing of the wireless speaker device, they can be plugged into a device having a USB female interface, such as a desktop or notebook computer, using the 5V DC provided by the USB female interface. Power supply for charging the Bluetooth headset carried on the stand. Therefore, there is one more way to use, which is more convenient and flexible. The Bluetooth headset can be charged from the computer through its stand, and can also be inserted into the computer as another way of placement.

Fig. 6(a) shows the modification of the Bluetooth earphone holder 5' as shown in Fig. 4(b), and the USB male interface 132 is set under the bottom support 7' to become the Bluetooth earphone holder 5"", and the back plate 6 becomes In the modified 6', a pair of power contacts in the USB male interface 132 are connected via a pair of electrical contacts 20 for charging the Bluetooth headset via the interior of the plastic member.

Fig. 6(b) shows the modification of the Bluetooth earphone holder 5" as shown in Fig. 5(b), and the USB male interface 132 is set under the bottom support 7' to become the Bluetooth earphone holder 5"", and the back plate 6 becomes After the modification, the pair of power contacts in the USB male interface 132 are connected to a pair of electrical contacts 20 for charging the Bluetooth headset via the inside of the plastic member. The rest of the figures in the figure have the same meaning as before.

An additional feature of the present embodiment is that a USB male interface is disposed at a lower end of the Bluetooth earphone bracket, and a pair of power contacts in the USB male interface and a pair of electrical contacts on the Bluetooth earphone bracket are connected through a plastic component; The lower end of the Bluetooth earphone holder is provided with a USB male interface, and a pair of power contacts in the USB male interface and a pair of electrical contacts on the Bluetooth earphone bracket are connected through the inside of the plastic member.

The electrical, electronic, and communication technologies involved in the present invention are known in the art and are not included in the scope of the present application.

Notice

CLAIMS CN 201315619

1.

A combination device of a wireless speaker and a Bluetooth earphone, characterized in that the combination device comprises a wireless speaker device part and a Bluetooth earphone and a bracket part thereof, the wireless speaker device comprising a wireless speaker, a microphone and a mobile phone The electronic device, the Bluetooth headset and the bracket portion thereof comprise a Bluetooth headset and a Bluetooth earphone bracket adapted to the external structure of the Bluetooth headset, the bracket comprises a headphone backplane, a headphone holder, and a position for positioning the lower end of the Bluetooth headset a card, a clamping device for positioning the upper end of the Bluetooth earphone, the Bluetooth earphone bracket portion being attached to the casing of the wireless speaker device, and configured to receive a DC power source on the car and to be adapted to the speaker a power supply device for the voltage required by the device and the Bluetooth headset, and a corresponding pair of electrical contacts at the lower end of the Bluetooth headset and the corresponding position of the Bluetooth headset holder. When the Bluetooth headset is disposed on the bracket, the pair of electricity The contacts are connected to each other to charge the battery in the Bluetooth headset.

2.

A combination of a wireless speaker and a Bluetooth headset according to claim 1, wherein said Bluetooth earphone holder is attached to the casing of said wireless speaker device in a unitary manner.

3.

The combination device of the wireless speaker and the Bluetooth earphone according to claim 1, wherein the Bluetooth earphone holder is attached to the casing of the wireless speaker device in a split, attachable or detachable manner. Above.

4.

The combination device of the wireless speaker and the Bluetooth earphone according to claim 3, wherein a fixing head is disposed at a near end of the Bluetooth earphone bracket, and a space of the fixed head is provided with a pair of male pins or female plugs. a fixing hole corresponding to the fixing head is disposed at an upper left corner or an upper right corner of the wireless speaker device, and a pair of female sockets or male pins are disposed in the fixing socket, and the fixing head and the fixing socket are disposed The jacks/pins are adapted to each other.

5.

The combination device of the wireless speaker and the Bluetooth earphone according to claim 4, wherein the lower end of the Bluetooth earphone holder is provided with a U SB male interface, and a pair of power contacts in the U SB male interface and the Bluetooth earphone bracket A pair of electrical contacts are turned on via the interior of the plastic member.

6.

The combination device of the wireless speaker and the Bluetooth earphone according to claim 3, wherein one side of the Bluetooth earphone holder is provided with a blade having a trapezoidal cross section, on the left side of the wireless speaker device or The right side is provided with a slot adapted to the insert piece, and a pair of electric contacts which can be connected to the power source, which are matched in position, shape and size, are respectively arranged on the outer surface of the insert piece and the slot.

7.

The combination device of the wireless speaker and the Bluetooth earphone according to claim 6, wherein the lower end of the Bluetooth earphone holder is provided with a U SB male interface, and a pair of power contacts in the U SB male interface and the Bluetooth earphone bracket A pair of electrical contacts are turned on via the interior of the plastic member.

8.

The combination device of the wireless speaker and the Bluetooth earphone according to claim 1, wherein the power source obtained by the power supply device and adapted to the voltage of the speaker device and the Bluetooth headset is first connected to the speaker device portion. It is connected in parallel to the Bluetooth earphone holder portion by a connecting wire inside the plastic member.

9.

The combination device of the wireless speaker and the Bluetooth earphone according to claim 1, wherein the power source obtained by the power supply device is suitable for the voltage of the speaker device and the Bluetooth headset, and is first introduced into the Bluetooth earphone bracket portion. And connected in parallel to the speaker device portion by a connecting wire inside the plastic member.

10.

The combination of the wireless speaker and the Bluetooth headset of claim 1 wherein the DC power source on the vehicle is a 12V/24V DC power source.

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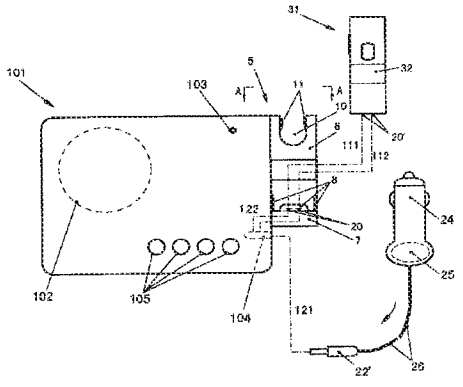
权利要求书 2 页 说明书 7 页 附图 6 页

[54] 实用新型名称

无线式扬声器与蓝牙耳机的组合装置

[57] 摘要

一种无线式扬声器与蓝牙耳机的组合装置，前者包括扬声器、麦克风及与手机适配的电子装置；后者包括蓝牙耳机及与该蓝牙耳机外部结构相适配的蓝牙耳机支架，它包括耳机架背板、耳机架底托、使蓝牙耳机下端就位的挡板、使蓝牙耳机上端就位的卡紧装置；蓝牙耳机支架部分是以整体或分体方式附设于所述无线扬声器装置的机壳之上，在所述蓝牙耳机的下端及所述蓝牙耳机支架的对应位置各有一对电接点，当蓝牙耳机安置该支架上时，所述各一对电接点相互接通而使蓝牙耳机内的电池充电。



1. 一种无线式扬声器与蓝牙耳机的组合装置，其特征是，该组合装置包括无线式扬声器装置部分和蓝牙耳机及其支架部分，所述无线扬声器装置包括无线式扬声器、麦克风及与手机适配的电子装置，所述蓝牙耳机及其支架部分包括蓝牙耳机及与该蓝牙耳机外部结构相适配的蓝牙耳机支架，该支架包括耳机架背板、耳机架底托、使蓝牙耳机下端就位的挡板、使蓝牙耳机上端就位的卡紧装置，所述蓝牙耳机支架部分附设于所述无线扬声器装置的机壳之上，并配置有接取汽车上的直流电源并变换至适用于所述扬声器装置及蓝牙耳机所需电压的电源装置，在所述蓝牙耳机的下端及所述蓝牙耳机支架的对应位置，各有一对电接点，当蓝牙耳机安置于该支架上时，所述各一对电接点相互接通而使蓝牙耳机内的电池充电。

2. 根据权利要求 1 所述的无线式扬声器与蓝牙耳机的组合装置，其特征是，所述蓝牙耳机支架是以整体的方式附设于所述无线扬声器装置的机壳之上的。

3. 根据权利要求 1 所述的无线式扬声器与蓝牙耳机的组合装置，其特征是，所述蓝牙耳机支架是以分体的、可装上或拆下的方式附设于所述无线扬声器装置的机壳之上的。

4. 根据权利要求 3 所述的无线式扬声器与蓝牙耳机的组合装置，其特征是，在所述蓝牙耳机支架的近上端设有固定头，该固定头内所包空间设有一对公插脚或母插孔，在所述无线扬声器装置的左上角或右上角设置有与该固定头相适配的固定窝，在该固定窝内设置一对母插孔或公插脚，所述固定头和固定窝内的插孔/插脚是相互适配的。

5. 根据权利要求 4 所述的无线式扬声器与蓝牙耳机的组合装置，其特征是，所述蓝牙耳机支架的下端设有 USB 公接口，该 USB 公接口内的一对电源接点与该蓝牙耳机支架上的一对电接点经由塑料构件内部接通。

6. 根据权利要求 3 所述的无线式扬声器与蓝牙耳机的组合装置，

其特征是，所述蓝牙耳机支架的一个侧面设有一个横断面为梯形的插片，在所述无线扬声器装置的左侧或右侧设置有与该插片相适配的插槽，在该插片和插槽的向外面上分别设置其位置、形状、尺寸互相适配的可以接通电源的一对电接点。

7. 根据权利要求 6 所述的无线式扬声器与蓝牙耳机的组合装置，其特征是，所述蓝牙耳机支架的下端设有 USB 公接口，该 USB 公接口内的一对电源接点与该蓝牙耳机支架上的一对电接点经由塑料构件内部接通。

8. 根据权利要求 1 所述的无线式扬声器与蓝牙耳机的组合装置，其特征是，所述电源装置得到的适用于所述扬声器装置及蓝牙耳机的电压的电源是首先通入所述扬声器装置部分，再由其塑料构件内部的连接导线而并联接通至所述蓝牙耳机支架部分。

9. 根据权利要求 1 所述的无线式扬声器与蓝牙耳机的组合装置，其特征是，所述电源装置得到的适用于所述扬声器装置及蓝牙耳机的电压的电源是首先通入所述蓝牙耳机支架部分，再由其塑料构件内部的连接导线而并联连通至所述扬声器装置部分。

10. 根据权利要求 1 所述的无线式扬声器与蓝牙耳机的组合装置，其特征是，所述汽车上的直流电源是 12V/24V 直流电源。

无线式扬声器与蓝牙耳机的组合装置

所属领域

本实用新型涉及与手机配套使用的听音及送话装置，更具体讲是与手机配套使用的无线式扬声器及麦克风和蓝牙耳机的组合装置。

背景技术

手机的使用已很普遍。在驾驶汽车时使用手机，由于交通安全要求驾驶者的手不能离开方向盘，所以人们创制了与手机配套使用的蓝牙耳机，即戴在耳旁的无线耳机与麦克风于一体的小型装置。后来，人们又创制了无线式扬声器及麦克风，把它安置在汽车内靠近使用者的位置，其优点是使用者不必在耳旁边设置挂物，车内其他人也可听到来话的内容。但是，蓝牙耳机的优点却是体积小巧，来话可保持私隐而不被其他人听到。于是，消费者决定买哪一种，颇费思虑。

背景技术中没有无线式扬声器与蓝牙耳机的组合装置

实用新型内容

本实用新型的目的是设计一种无线式扬声器与蓝牙耳机的组合装置，该组合装置包括无线扬声器装置部分和蓝牙耳机及其支架部分，所述无线扬声器装置包括无线式扬声器、麦克风及与手机适配的电子装置，所述蓝牙耳机及其支架部分包括蓝牙耳机及与该蓝牙耳机外部结构相适配的蓝牙耳机支架，该支架包括耳机架背板、耳机架底托、使蓝牙耳机下端就位的挡板、使蓝牙耳机上端就位的卡紧装置，所述蓝牙耳机支架部分附设于所述无线扬声器装置的机壳之上，并配置有接取汽车上的12V/24V DC电源并变换至适用于所述扬声器装置及蓝牙耳机所需电压的电源装置，在所述蓝牙耳机的下端及所述蓝牙耳机支架的对应位置，各有一对电接点，当蓝牙耳机安置于该支架上时，所述各一对电接点相互接通而使蓝牙耳机内的电池充电。

本实用新型的无线式扬声器与蓝牙耳机的组合装置，所述蓝牙耳机

支架是以制造成整体的方式附设于所述无线扬声器装置的机壳之上的。

本实用新型的无线式扬声器与蓝牙耳机的组合装置，所述蓝牙耳机支架是以制造成分体的、可装上或拆下的方式附设于所述无线扬声器装置的机壳之上的。

本实用新型的无线式扬声器与蓝牙耳机的组合装置，在所述蓝牙耳机支架的近上端设有固定头，该固定头内所包空间设有一对公插脚或母插孔，在所述无线扬声器装置的左上角或右上角设置有与该固定头相适配的固定窝，在该固定窝内设置一对母插孔或公插脚，所述固定头和固定窝内的插孔/插脚是相互适配的。

本实用新型的无线式扬声器与蓝牙耳机的组合装置，所述蓝牙耳机支架的下端设有 USB 公接口，该 USB 公接口内的一对电源接点与该蓝牙耳机支架上的一对电接点经由塑料构件内部接通。

本实用新型的无线式扬声器与蓝牙耳机的组合装置，所述蓝牙耳机支架的一个侧面设有一个横断面为梯形的插片，在所述无线扬声器装置的左侧或右侧设置与该插片相适配的插槽，在该插片和插槽的向外面上分别设置其位置、形状、尺寸互相适配的可以接通电源的一对电接点。

本实用新型的无线式扬声器与蓝牙耳机的组合装置，所述蓝牙耳机支架的下端设有 USB 公接口，该 USB 公接口内的一对电源接点与该蓝牙耳机支架上的一对电接点经由塑料构件内部接通。

本实用新型的无线式扬声器与蓝牙耳机的组合装置，所述电源装置得到的适用于所述扬声器装置及蓝牙耳机的电压的电源是首先通入所述扬声器装置部分，再由其塑料构件内部的连接导线而并联接通至所述蓝牙耳机支架部分。

本实用新型的无线式扬声器与蓝牙耳机的组合装置，所述电源装置得到的适用于所述扬声器装置及蓝牙耳机的电压的电源是首先通入所述蓝牙耳机支架部分，再由其塑料构件内部的连接导线而并联连通至所述扬声器装置部分。

本实用新型的无线式扬声器与蓝牙耳机的组合装置，所述汽车上的 DC 电源是 12V/24V DC 电源。

本实用新型的无线式扬声器与蓝牙耳机的组合装置，是在前述无线式扬声器（及发送话筒）的基础上，设置一个可以安置蓝牙耳机的支架，于是蓝牙耳机在不用时即可存放于该支架上，同时还可以为该支架接通电源而为蓝牙耳机充电。于是，消费者一次购买即可二者兼得，其费用必定会比二者之和为低。

附图说明

图 1 是已知的单独的无线扬声器装置的示意图。

图 2（a）至图 2（d）是已知的蓝牙耳机的示意图。其中，图 2（a）是已知的蓝牙耳机的背视图（没有耳塞听筒颈和听筒头的一面），图 2（b）是已知的蓝牙耳机的正面图，图 2（c）是已知的蓝牙耳机的侧视图，图 2（d）是已知的蓝牙耳机的仰视图。

图 3（a）至图 3（d）是本实用新型的无线式扬声器与蓝牙耳机的组合装置的示意图（两者以整体方式构成组合）。其中，图 3(a)是本实用新型的无线式扬声器与蓝牙耳机的组合装置的正面图，图 3(b)是本实用新型的无线式扬声器与蓝牙耳机的组合装置的侧视图，图 3（c）是本实用新型的无线式扬声器与蓝牙耳机的组合装置的局部俯视图，图 3（d）本实用新型的无线式扬声器与蓝牙耳机的组合装置的是背视图。

图 4（a）和图 4（c）是以分体方式之一构成的本实用新型的无线式扬声器与蓝牙耳机的组合装置的示意图。其中，图 4（a）表示在无线扬声器装置的一个上角设置一个固定窝的示意图。图 4（b）是在蓝牙耳机支架的上部设置固定头的示意图。图 4（c）是图 4(b)中的 B-B 视图。

图 5（a）和图 5（b）是以分体方式之二构成的本实用新型的无线式扬声器与蓝牙耳机的组合装置的示意图。其中，图 5（a）表示在无线扬声器装置 101”的一个上角设置插槽的示意图。图 5（b）表示在蓝牙耳机支架 5”的一侧设有插片的示意图。

图 6（a）和图 6（b）是分体方式之另一方案构成的本实用新型的无线式扬声器与蓝牙耳机的组合装置的示意图。其中，图 6（a）所示是把如图 4（b）的蓝牙耳机支架 5’改装的示意图。图 6（b）所示是把如图 5（b）的蓝牙耳机支架 5” 改装的示意图。

具体实施方式

本实用新型设计了一种无线式扬声器装置与蓝牙耳机的组合装置，该组合装置包括无线扬声器装置部分和蓝牙耳机及其支架部分，所述无线扬声器装置包括无线式扬声器、麦克风（发送话筒）及与手机适配的电子装置，所述蓝牙耳机及其支架部分包括蓝牙耳机及与该蓝牙耳机外部结构相适配的蓝牙耳机支架，该支架包括耳机架背板、耳机架底托、使蓝牙耳机下端就位的挡板、使蓝牙耳机上端就位的卡紧装置，所述蓝牙耳机支架部分是以整体或分体方式附设于所述无线扬声器装置的机壳之上，并配置有接取汽车上的 12V/24V DC 电源并变换至适用于所述扬声器装置及蓝牙耳机所需电压的电源装置，在所述蓝牙耳机的下端及所述蓝牙耳机支架的对应位置，各有一对电接点，当蓝牙耳机安置于该支架上时，所述各一对电接点相互接通而使蓝牙耳机内的电池充电。

图 1 所示是已有的单独的无线扬声器装置 100 的示意图。标号 102 代表机壳内设置的扬声器，103 是麦克风（发送话筒），104 是入接电源的插孔，105 是若干个操作按钮或指示灯（其数目和位置可因不同的设计而变动），它所必需的电子装置设置于机壳之内，从略。标号 24 是从汽车内 12V/24V DC 电源接插的插头，25 是其内设置的把电源变换为该无线扬声器装置和蓝牙耳机所需电压的变换装置（此装置在图中是与插头 24 设在一起，也可单独设置或设在无线扬声器装置中，图中未示出），26 是引出电源的导线，22’是入电插头，通过点画线 121 所指引，插入插孔 104 中，当使用者启用手机打出电话或接听来话后，启动该扬声器装置，即可由其扬声器 102 接听来话，由麦克风 103 把使用者的话音送到对方。

图 2（a）至图 2（d）是蓝牙耳机 31（其某一款式举例）示意图。图 2（a）是背视图（没有耳塞听筒颈和听筒头的一面），图 2（b） 是正面图，图 2（c）是侧视图，标号 32 是其本体，33 是耳塞听筒颈，34 是听筒头，36 是若干个操作按钮或指示灯（其数目和位置可因不同的设计而变动），图 2（d）是仰视图，标号 20’表示设于其底部的一对电接点，供其内所置电池充电之用。

图 3（a）至图 3（d）是本实用新型的无线扬声器装置与蓝牙耳机及

其支架的组合装置 101。图 3(a)是正面图，3(b)是侧视图，3（c）是局部俯视图，3（d）是背视图，标号 5 是以整体方式设置于无线扬声器装置机壳右侧的蓝牙耳机支架（不言而喻，也可以设置在该机壳的其他位置，例如设于左侧，图中未示出）。标号 6 是支架 5 的背板，标号 7 是托住蓝耳机 31 的底部的底托，标号 8 是接纳蓝牙耳机 31 的底部的挡板（这里是由三小块组成，也可以是其他构造 ，图中未示出），标号 10 是蓝牙耳机支架上部的豁口，用以接纳蓝牙耳机的耳塞听筒颈 33，标号 11 是该豁口内设置的弹力卡夹，用以夹紧耳塞听筒颈 33，标号 20 是设于蓝牙耳机支架 31 的底托 7 上的一对电接点，其位置与构造要与所支架的蓝耳机底部的一对电接点 20’相互适配。如点画线 111 及 112 所指引，蓝牙耳机 31 插入支架 5 之内后，其耳塞听筒颈 33 进入豁口 10 中，由弹力卡夹 11 夹住而固定，同时电接点 20’与电接点 20 相接触而接通，供蓝牙耳机 31 之内的电池充电。又如虚线 122 所示，入电插孔 104 所得到的电源，一路供作无线扬器装置的电源，并联的一路由塑料构件内部接引至蓝牙耳机支架 5 的底托 7 上的一对电接点 20，供蓝牙耳机 31 充电之用。

图 3（a）中所示是入电插孔 104 设于无线扬声器装置的机壳上。电源先由该处通入，再由塑料构件内部的导线接引至蓝牙耳机支架 5 的电接点 20。也可以把入电插孔 104 设于蓝牙耳机支架 5 的底部（或背部），电源在该处通入后，由塑料构件内部的导线接引至无线扬声器装置之内，图中未示出此方式。标号 106 是无线扬声器装置背后所设的 4 个绑带圈，用于把绑带穿过其中，把该组合装置固定在汽车内适当位置，例如前窗遮阳板上。

蓝牙耳机体积很小，消费者使用时常遇到一项烦恼，在使用后常常随手放置面在下次要用时急切中找不到它。有了本实用新型的组合装置，在不使用蓝牙耳机时可以把它固定在所述蓝牙耳机支架上，一方面可以随时充电至满，在需要用它时伸手就可以拿到，很是方便。

本实施方案涉及的附加特征是：所述蓝牙耳机支架是以制造成整体的方式附设于所述无线扬声器装置的机壳之上的；所述电源装置得到的适用于所述扬声器装置及蓝牙耳机的电压的电源是首先通入所述扬声器

装置部分，再由其塑料构件内部的连接导线而并联接通至所述蓝牙耳机支架部分；所述电源装置得到的适用于所述扬声器装置及蓝牙耳机的电压的电源是首先通入所述蓝牙耳机支架部分，再由其塑料构件内部的连接导线而并联连通至所述扬声器装置部分。

以上的实施方案是蓝牙耳机支架部分与无线扬声器装置部分制成整体的。以下的方案则是分体式的。

图 4（a）和图 4（b）是分体方式之一，图 4（a）表示在无线扬声器装置 101’的一个上角（图中所示是右上角，也可以是左上角，未在图中示出）设置一个固定窝 68，其内设有接通电源的一对公插脚 69（如该图中所示）或母插孔 67(图中未示)。图 4（b）是在蓝牙耳机支架 5’的上部设置固定头 66，在其内设置接通电源的一对母插孔 67(如该图中所示)或公插脚 69(图中未示)。一对母插孔 67 与供蓝牙耳机充电的一对电接点 20 通过塑料构件内部接通。图 4（c）是改型后的蓝牙耳机支架背板成为标号 6’所示，当把固定头 66 插入固定窝 68 之内，蓝牙耳机支架 5’就附在无线扬声器装置 101’之上而成为一体，同时一对公插脚 69 插入一对母插孔 67 之中而接通电源。图 4（c）是图 4(b)中的 B-B 视图，用以表示固定头 66 和母插孔 67 的底面。图中其余标号含义同前。

图 5（a）和图 5（b）是另一分体方式。图 5（a）表示在无线扬声器装置 101”的一个上角（图中所示是在右上角，也可以是在左上角，图中未示出）设置插槽 131，在其向外面设一对电接点 20'''。图 5（b）表示在蓝牙耳机支架 5”的一侧设有插片 130，该插片的横断面是梯形的，并且与插槽 131 的横断面相适配，以便插入而牢固地附于该处。在插片 130 的向外面有一对电接点 20”，它与供蓝牙耳机充电的一对电接点 20 经由塑料构件之内接通。标号 6”是改型后的背板。电接点 20”和 20'''的形状与位置互相配合，蓝牙耳机支架 5”的插片 130 插到无线扬声器装置 101”的插槽 131 上之后，可以相互接通电源。图中其余标号含义同前。

本实施方案涉及的附加特征是：所述蓝牙耳机支架是以制造成分体的、可装上或拆下的方式附设于所述无线扬声器装置的机壳之上的；在所述蓝牙耳机支架的近上端设有固定头，该固定头内所包空间设有一对

公插脚或母插孔，在所述无线扬声器装置的左上角或右上角设置有与该固定头相适配的固定窝，在该固定窝内设置一对母插孔或公插脚，所述固定头和固定窝内的插孔/插脚是相互适配的；所述蓝牙耳机支架的一个侧面设有一个横断面为梯形的插片，在所述无线扬声器装置的左侧或右侧设置与该插片相适配的插槽，在该插片和插槽的向外面上分别设置其位置、形状、尺寸互相适配的可以接通电源的一对电接点。

再一个实施方案则是在上述分体方式的方案基础上，在其中的蓝牙耳机支架的底部增添一个 USB 公接口。于是，当蓝牙耳机支架不附装在无线扬声器装置的机壳上时，可以将它们接插在具有 USB 母接口的设备上，例如台式或笔记本式电脑上，利用该 USB 母接口提供的 5V DC 电源，供该支架上所载的蓝牙耳机充电。于是，在使用上又多一种方式，更为方便灵活，蓝牙耳机可以通过其支架而从电脑上充电，同时也可以把将之插置在电脑上作为另一种安置方式。

图 6（a）所示是把如图 4（b）的蓝牙耳机支架 5’改装，在其底托 7’之下设置 USB 公接口 132 而成为蓝牙耳机支架 5””，其背板 6 成为改装后的 6’，该 USB 公接口 132 内的一对电源接点经由塑料构件内部与供蓝牙耳机充电的一对电接点 20 接通。

图 6（b）所示是把如图 5（b）的蓝牙耳机支架 5” 改装，在其底托 7’之下设置 USB 公接口 132 而成为蓝牙耳机支架 5”’，其背板 6 成为改装后的 6”，该 USB 公接口 132 内的一对电源接点经由塑料构件内部与供蓝牙耳机充电的一对电接点 20 接通。图中其余标号含义同前。

本实施方案涉及的附加特征是：所述蓝牙耳机支架的下端设有 USB 公接口，该 USB 公接口内的一对电源接点与该蓝牙耳机支架上的一对电接点经由塑料构件内部接通；所述蓝牙耳机支架的下端设有 USB 公接口，该 USB 公接口内的一对电源接点与该蓝牙耳机支架上的一对电接点经由塑料构件内部接通。

本实用新型中所涉及到的电工、电子以及通信技术本身，都是已知技术，并且不包括在本申请要求保护的范围。

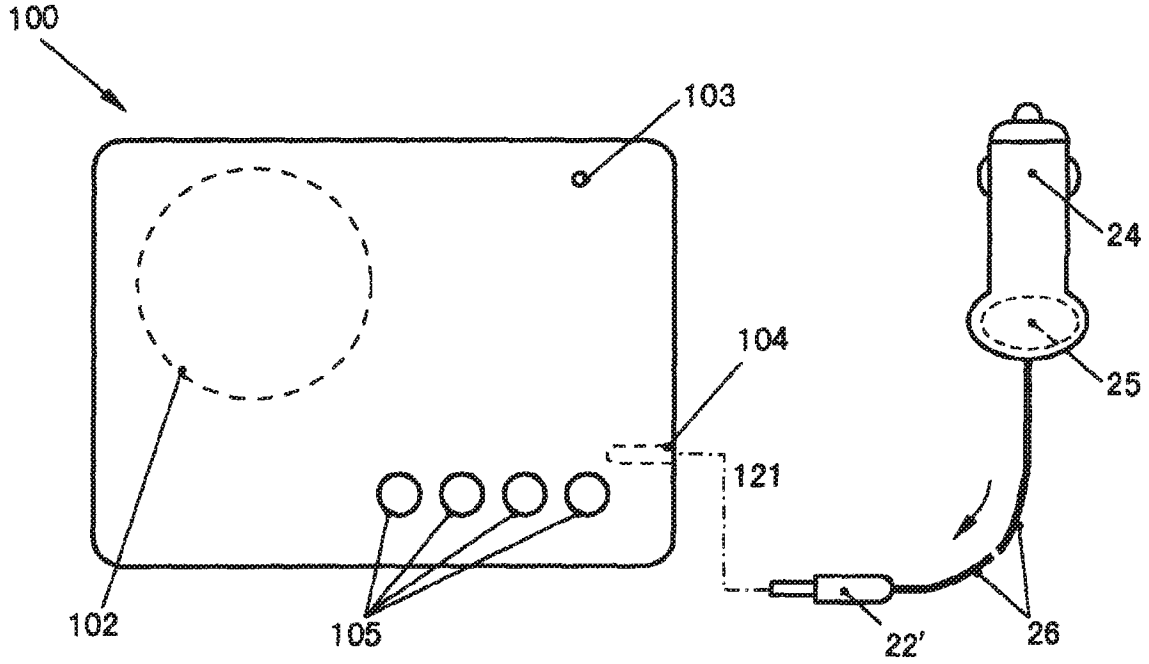


图 1

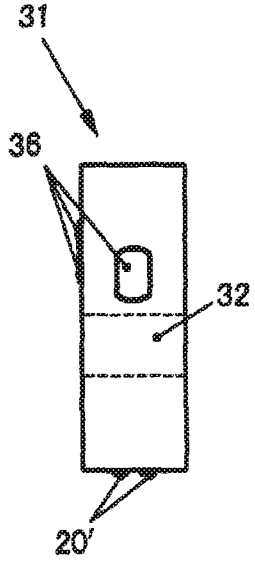


图 2(a)

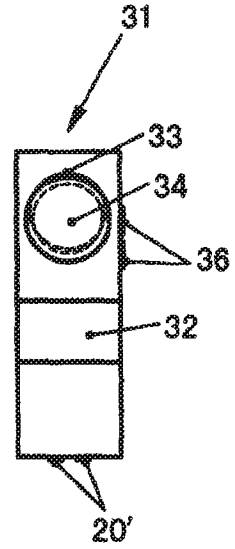


图 2(b)

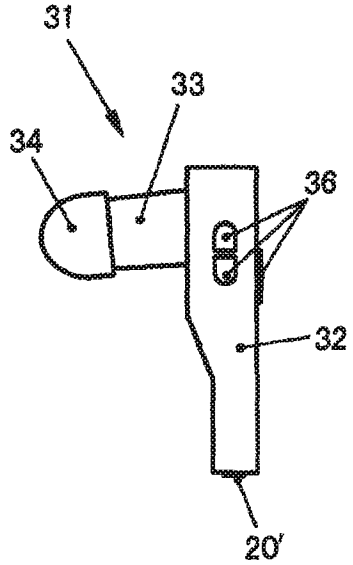


图 2(c)

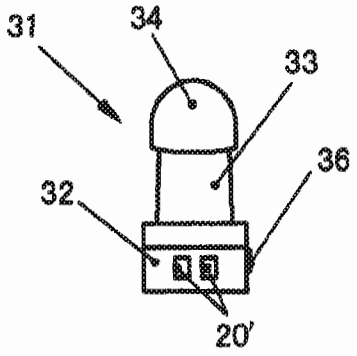

31
34
33
36
32
20'

图 2(d)

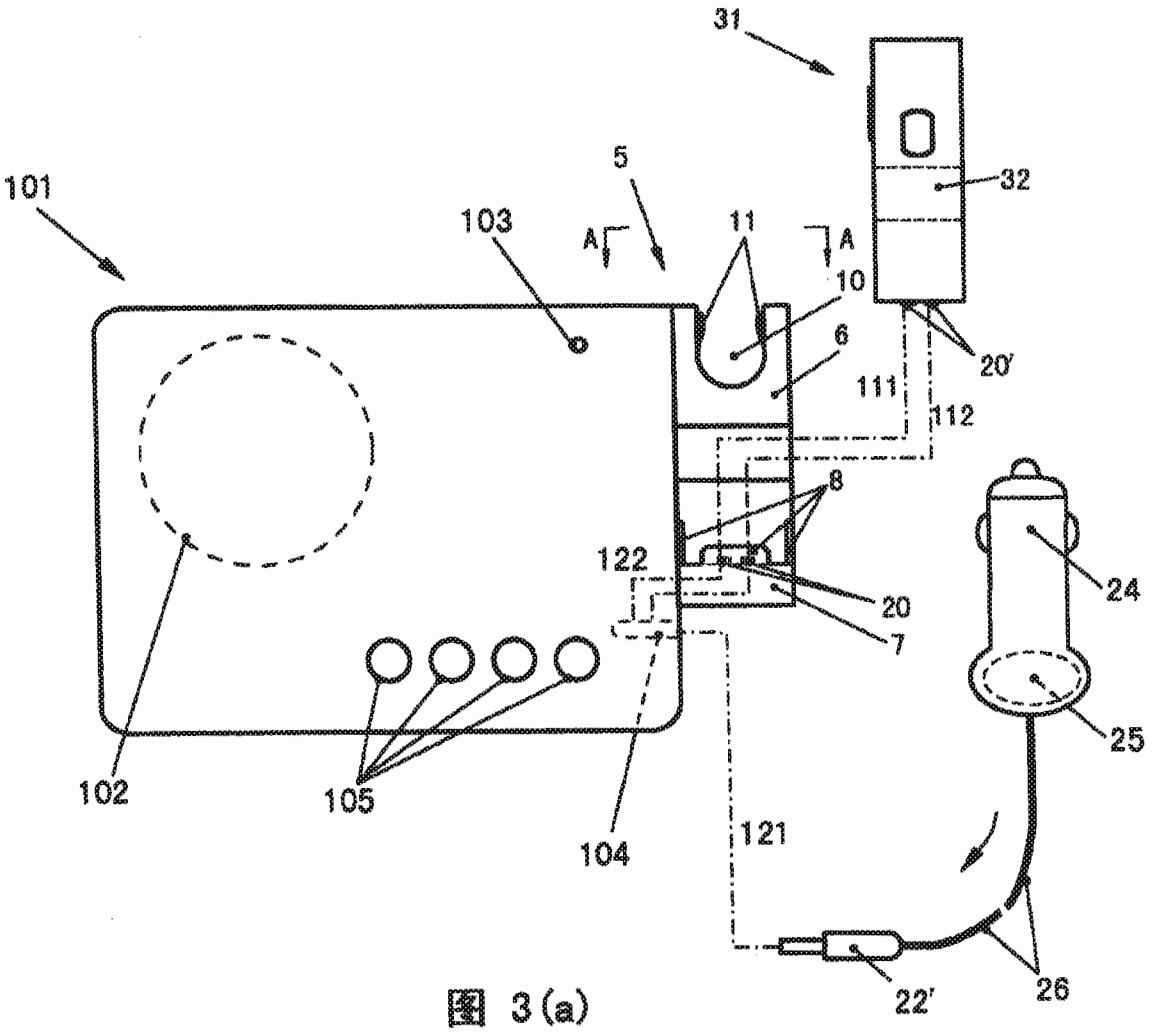

31
32
5
101
103
A
11
A
10
6
20'
111
112
8
122
20
7
24
25
102
105
104
121
22'
26

图 3(a)

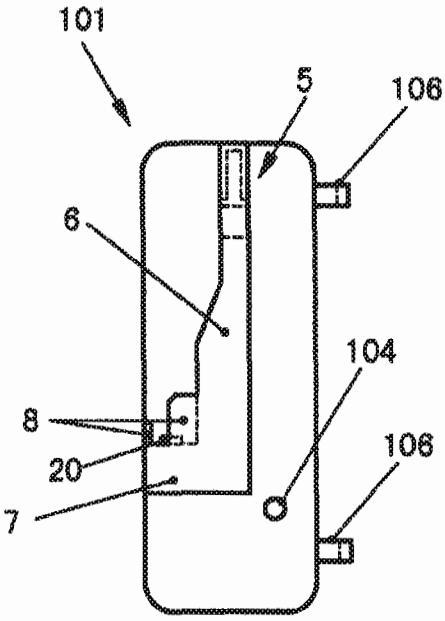
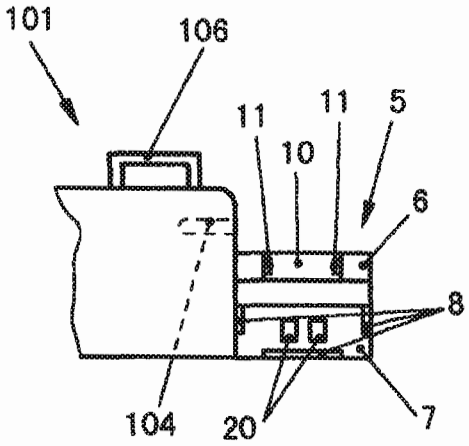


图 3(b)



A-A 视图

图 3(c)

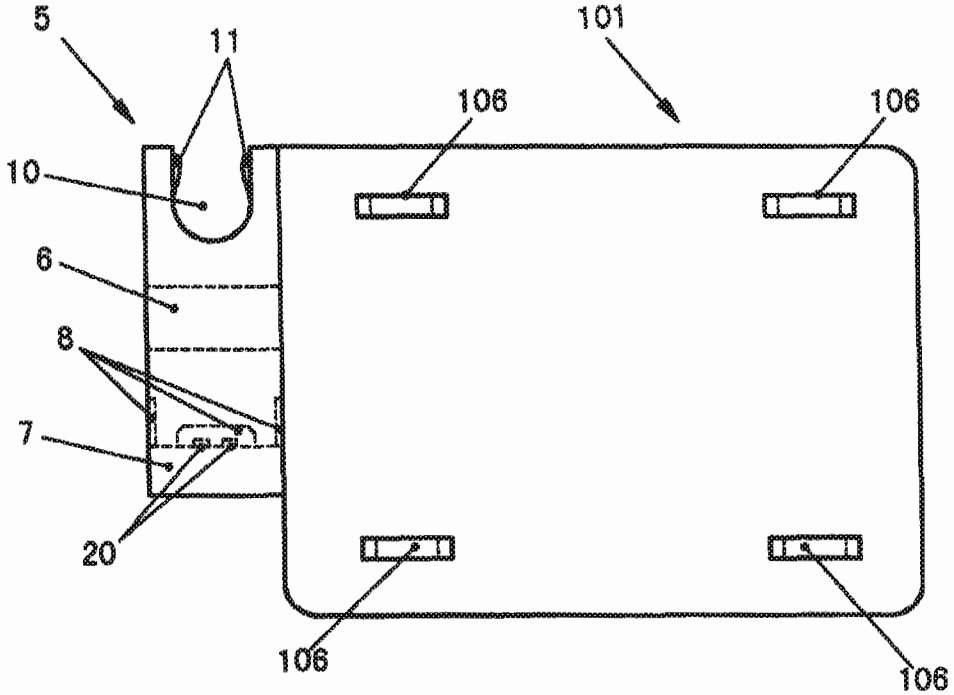


图 3(d)

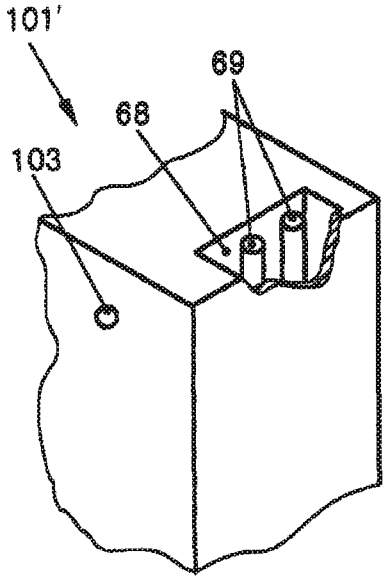


图 4(a)

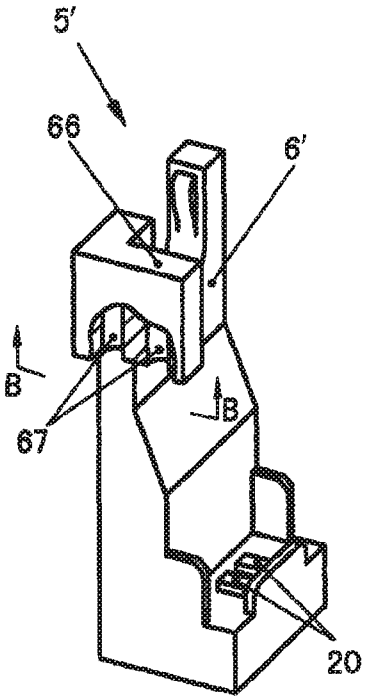
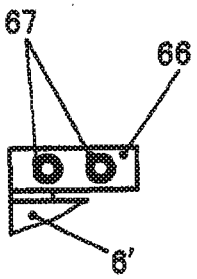


图 4(b)



B-B 视图

图 4(c)

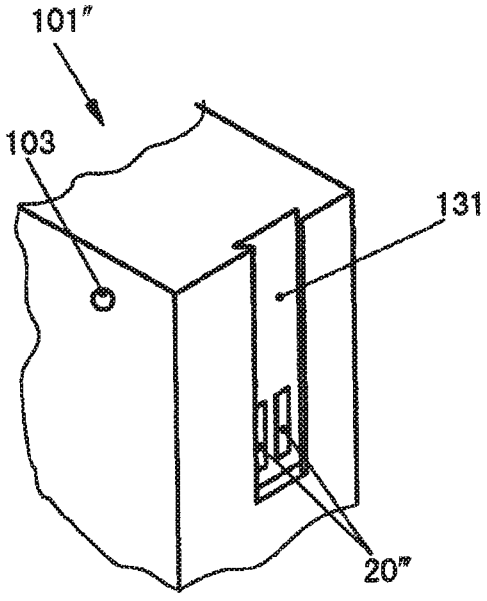


图 5(a)

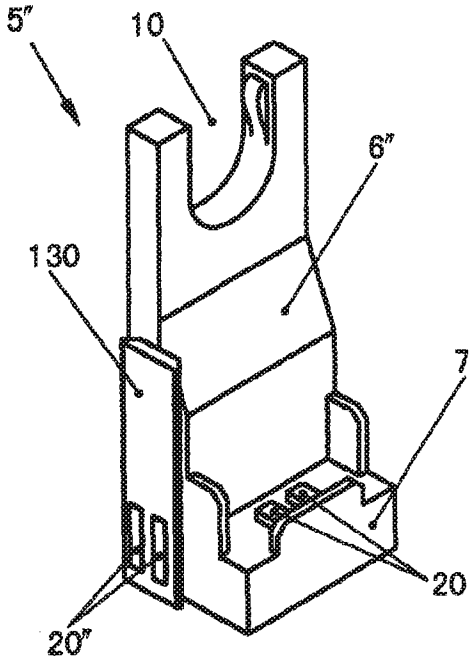


图 5(b)

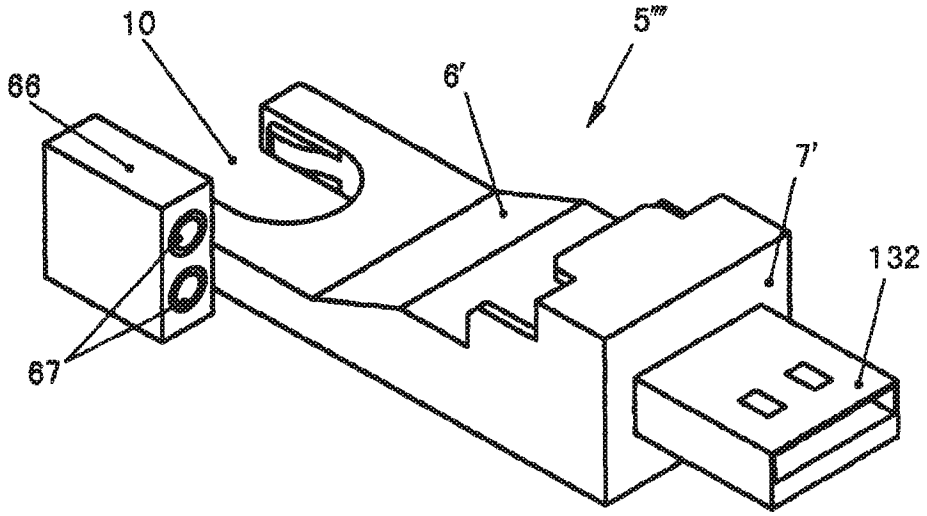


图 6(a)

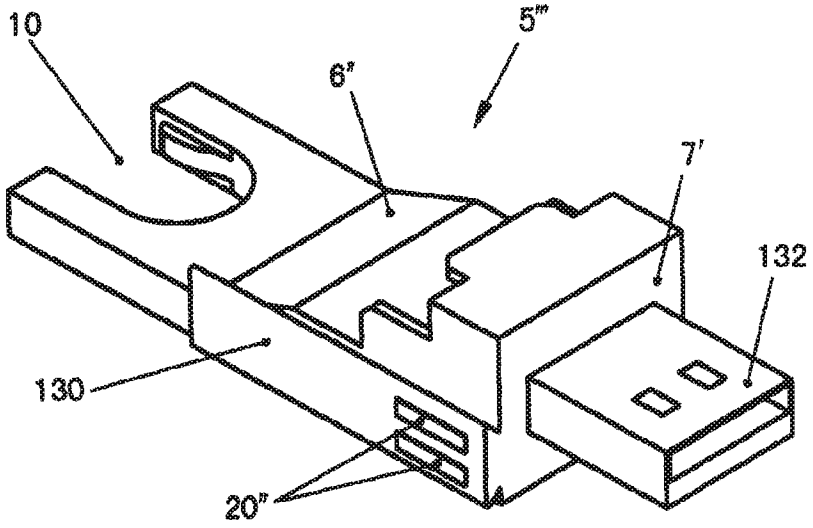


图 6(b)

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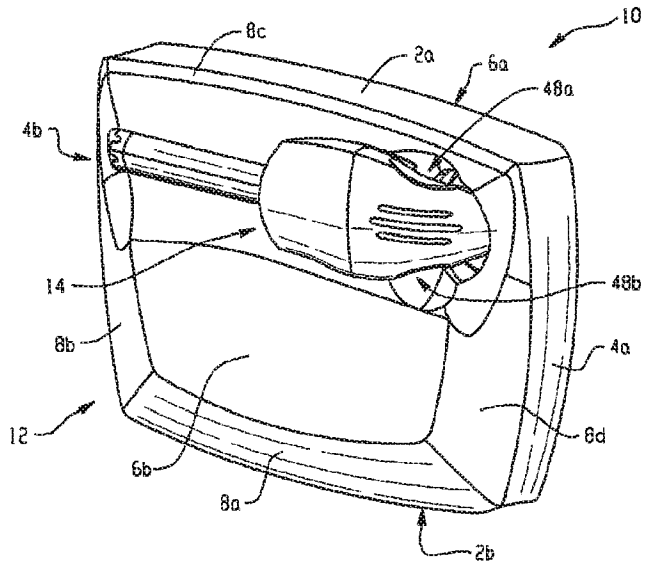
[Continued on next page]

(54) Title: COMMUNICATION DEVICE WITH MULTIPLE DETACHABLE COMMUNICATION MODULES



(57) Abstract: A communication device having multiple detachable communication modules includes a first communication module and a second communication module. The first communication module is configured to receive RF signals from a wireless network. The second communication module may be physically attached to the first communication module and is coupled to the first communication module by a wireless link. The second communication module is configured to receive the RF signals from the first communication module over the wireless link and to convert the RF signals into an audible signal. In addition, the second communication module is physically dimensioned so that it may be fitted into or onto an ear of a communication device user.

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CG, CI, CM, GA, GN, GQ, GW, ML, MR, NE, SN, TD, TG).

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— *as to the applicant's entitlement to claim the priority of the earlier application (Rule 4.17(iii)) for the following designations AE, AG, AL, AM, AT, AU, AZ, BA, BB, BG, BR, BY, BZ, CA, CH, CN, CO, CR, CU, CZ, DE, DK, DM, DZ, EC, EE, ES, FI, GB, GD, GE, GH, GM, HR, HU, ID, IL, IN, IS, JP, KE, KG, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MA, MD, MG, MK, MN, MW, MX, MZ, NO, NZ, PL, PT, RO, RU, SD, SE, SG, SI, SK, SL, TJ, TM, TR, TT, TZ, UA, UG, UZ, VN, YU, ZA, ZW, ARIPO patent (GH, GM, KE, LS, MW, MZ, SD, SL, SZ, TZ, UG, ZW), Eurasian patent (AM, AZ, BY, KG, KZ, MD, RU, TJ, TM), European patent (AT, BE, CH, CY, DE, DK, ES, FI, FR, GB, GR, IE, IT, LU, MC, NL, PT, SE, TR), OAPI patent (BF, BJ, CF, CG, CI, CM, GA, GN, GQ, GW, ML, MR, NE, SN, TD, TG)*

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Communication Device With Multiple Detachable Communication Modules

CROSS-REFERENCE TO RELATED APPLICATION

This application claims priority from and is related to the following prior application: "Communication Device With Multiple Detachable Communication Modules," United States Provisional Application No. 60/246,533, filed November 7, 2000. This prior application, including the entire written description and drawing figures, is hereby incorporated into the present application by reference.

BACKGROUND

1. FIELD OF THE INVENTION

This invention relates to communication devices in general, and particularly to wireless communication devices having multiple detachable communication modules.

2. DESCRIPTION OF THE RELATED ART

There has been a proliferation of wireless mobile communication devices in recent years in the field of telecommunications. Devices such as cordless and cellular telephones, pagers, wireless modems, wireless email devices, personal digital assistants (PDAs) with communications functions, and other mobile communication devices are becoming commonplace. Known communication devices, however, are typically single-element or single-module designs. In order to enable hands-free operation of such single-module communication devices, specialized additional equipment is typically required. For example, a wired headset is often available for known communication devices that typically connects to the communication device through an electrical jack or plug. Another common hands-free

accessory available for cellular telephones is a docking cradle, which is typically intending for mounting the communication device in a vehicle.

SUMMARY

A communication device having multiple detachable communication modules includes a first communication module and a second communication module. The first communication module is configured to receive RF signals from a wireless network. The second communication module may be physically attached to the first communication module and is coupled to the first communication module by a wireless link. The second communication module is configured to receive the RF signals from the first communication module over the wireless link and to convert the RF signals into an audible signal. In addition, the second communication module is physically dimensioned so that it may be fitted into or onto an ear of a communication device user.

BRIEF DESCRIPTION OF THE DRAWINGS

Fig. 1 is a bottom perspective view of an exemplary communication device having a first communication module and a second detachable communication module for insertion into the communication device user's ear;

Fig. 2 is another bottom perspective view of the exemplary communication device shown in Fig. 1, in which the second communication module has been removed from the first communication module;

Fig. 3 provides a more detailed view of the cavity in the housing of the first communication module;

Fig. 4 is a top perspective view of the second communication module shown in Figs. 1 and 2;

Fig 5 is a bottom perspective view of the second communication module that shows additional exemplary features, including a power switch and charging terminals;

Fig. 6 is a bottom perspective view of the communication device showing operative-mode connection terminals on the second communication module;

Fig. 7 is a bottom perspective view of the first communication module showing both operative-mode connection terminals and inoperative-mode connection terminals;

Fig. 8 is a bottom perspective view of the second communication module showing inoperative-mode connection terminals;

Fig. 9 is a bottom perspective view of the first communication module showing the multifunctional connection terminals;

Fig. 10 is a bottom perspective view of the second communication module showing a set of charging terminals;

Fig. 11 is a bottom perspective view of an exemplary communication device having a first and second communication module, in which the first communication module includes a protective movable door;

Fig. 12 shows a movable door that is molded or otherwise worked to bear an emblem, a logo, a user identifier or the like;

Fig. 13 shows another exemplary communication device in which a first communication module includes a substantially enclosed cavity into which a second communication module is mounted;

Figs. 14a and 14b respectively show exemplary embodiments in which the first communication module is a cellular telephone and a laptop computer or PDA;

Fig. 15a shows a top perspective view of an alternative second communication module;

Fig. 15b shows a side perspective view of the alternative second communication module;

FIG. 16 is an exemplary electrical block diagram of the multi-module communication devices shown in FIGs. 1-15;

Fig. 17 illustrates one contemplated implementation of the communication device described above;

Fig. 18 illustrates a further embodiment of a communication device that includes wireless communication between the device modules and a third module, such as an RF interface cradle; and

Fig. 18a is a more detailed illustration of the third module shown in Fig. 18.

DETAILED DESCRIPTION

Referring now to the drawing figures, Fig. 1 is a bottom perspective view of an exemplary communication device 10 having a first communication module 12 and a second detachable communication module 14 for insertion into the communication device user's ear. The first communication module 12 includes a housing with substantially parallel and planar opposite top and bottom walls 2a and 2b, substantially parallel and planar opposite side walls 4a and 4b, and substantially parallel and planar opposite front and back walls 6a and 6b. The back wall 6b preferably includes bevelled surfaces 8a-8d located along the edges where the back wall 6b adjoins the top, bottom and side walls 2a, 2b, 4a and 4b, but may also be planar, joining the top, bottom and side walls 2a, 2b, 4a and 4b at substantially right angles. The top wall 2a, bottom wall 2b and side walls 4a and 4b are preferably slightly curved, but may also be planar. The specific shapes of the housing walls are dependent upon the requirements of the first communication module 12, as will become apparent from the following description.

Fig. 2 is another bottom perspective view of the exemplary communication device 10 shown in Fig. 1, in which the second communication module 14 has been removed from the first communication module 12. The housing of the first communication module 12 preferably includes a cavity 16 in which the second communication module may be detachably mounted.

Fig. 3 provides a more detailed view of the cavity 16 in the housing of the first communication module 12. The cavity 16 preferably includes a plurality of subcavities that are shaped to accommodate the second communication module 12, each of which may be a different size, shape and depth. For instance, the exemplary cavity shown in Fig. 3 includes three subcavities: a substantially circular subcavity 18 having a first depth, a first rectangular cavity 20 having a second depth, and a second rectangular cavity 22 having a third depth. The cavity 16 also preferably includes a plurality of surfaces 24, 26b, 28 and 30 that provide smooth transitions between the subcavities 18, 20 and 22, and a plurality of surfaces 26a, 26c, 32, 34, 36a, 36b, 38, 40, 42, 44, 46a and 46b that are preferably contoured and sized primarily to produce a desired physical appearance when the second communication module 14 is mounted as in Fig. 1.

The surfaces of the cavity 16 preferably also provide for retention of the second communication module 14 within the cavity 16. Surfaces 36a and 36b and/or surfaces 46a and 46b may, for example, be contoured to engage the sides of the second communication module 14 in order to frictionally hold it within the cavity 16. In another embodiment, surfaces in or adjacent to the cavity 16 may include retention means, such as nubs or protrusions, that engage detents in corresponding parts of the second communication module 14, or vice versa, to detachably hold the second communication module 14 within the cavity 16. In yet another embodiment, other retention means, such as springs or otherwise elastically-biased protrusions or hooks, may be included on the first or second

communication module that cooperate with appropriate mating retention means on the other of the first or second communication module. Alternatively, additional means to maintain the device in an assembled position, such as a movable clip arrangement, could be mounted on the first communication module 12.

In order to remove the second communication module 14 from the cavity 16, the surfaces 26a, 26b and 26c are preferably contoured to provide spaces 48a and 48b (shown in Fig. 1) that enable a communication device user to grasp the sides of the second communication module 14. In addition, the second communication module 14 preferably includes depressions 50 and 52 (shown in Figs. 4 and 5) that enable the communication device user to easily grip the module 14 while it is within the cavity 16. Preferably, the retention means described above are adapted to apply sufficient force to retain the second communication module 14 in a mounted position, while allowing a communication device user to easily remove the second communication module 14 for use.

Fig. 4 is a top perspective view of the second communication module 14 shown in Figs. 1 and 2. The second communication module 14 is preferably a voice communication device that includes a speaker 14a, a main body 14b, a boom 14c and a microphone 14d. Operationally, the speaker 14a is placed in the ear of a communication device user with the boom 14c extending towards the user's mouth. To avoid rotational movement of the second communication module 14 while the speaker 14a is in the user's ear, the center of gravity of the module 14 should preferably be as close to the speaker 14a as possible. Thus, any relatively heavy components located inside the main body portion 14b should preferably be located adjacent the speaker 14a. In this manner, moments about the speaker are minimized, and the second communication module 14 should remain substantially stationary while the speaker is in the communication device user's ear.

Optimally, the length of the boom portion 14c should be maximized such that the microphone 14d is located in the proximity of the communication device user's mouth when the module 14 is in use. The moment about the speaker 14a, however, increases in proportion to the length of the boom 14c. Thus, in order to maintain stability, the length of the boom 14c may not be sufficient to position the microphone 14d adjacent to a user's mouth. The microphone 14d will, therefore, likely receive not only a user's speech, but also undesired noise signals from a multitude of sources, such as other speakers in the vicinity or car engine noise. In order to reduce this background noise, the second communication module preferably includes a noise cancellation circuit with a background noise microphone 48 as shown in Fig. 4. The background noise microphone 48 preferably detects background noise signals which are then subtracted from the corrupted speech received by the microphone 14d in the noise cancellation circuit. In this manner, a higher quality speech signal is provided.

Fig 5 is a bottom perspective view of the second communication module 14 that shows additional exemplary features, including a power switch 54 and charging terminals 56. The power switch 54 is preferably a pushbutton switch that turns the second communication module 14 on and off, enabling the communication device user to limit power consumption while the module 14 is not in use. In a preferred embodiment, the second communication module 14 is also configured to turn on automatically when removed from its assembled position within the first communication module 12, and to turn off automatically when replaced in its mounted position. In this preferred embodiment, the power switch 54 may be used to turn off the second communication module 13 without returning it to its mounted position. In other embodiments, the second communication module 14 may also include other switched functions, such as a mute function, controlled by one or more additional switches located on the first and/or second module. For example, a mute function may

operate to disable the microphone 14d and the background noise microphone 48 without ending a communication function such as a voice call.

The charging terminals 56 on the second communication module 14 preferably mate with corresponding charging terminals 46 on the first communication module 12 shown in Fig. 3. Also shown in Figs. 3 and 5 are alternative locations 46a and 56a for the respective charging terminals. The second communication module 14 preferably includes a rechargeable power source that is recharged by the first communication module 12 through the charging terminals 46 and 56 while the second communication module is in its fully mounted position as shown in Fig. 1. The charging terminals 46 on the first communication module 12 are preferably coupled to an internal power source through appropriate conversion and control circuitry in order to provide a charge to an additional power source in the second communication module.

In addition, the charging terminals 46 and 56 preferably include appropriate structures or arrangements to prevent discharging of the respective power sources or damage to internal components caused by external contact with the terminals. For example, the charging terminals 56 may be recessed below the surface of the main body 14b of the second communication module 14 in order to reduce the likelihood of external contact with the charging terminals 56, resulting in a short-circuit. In such an embodiment, the charging terminals 46 on the first communication module 12 may protrude from the surface 26b in order to make contact with recessed charging terminals 56 in the second communication module 14.

With reference to Fig. 3, the first communication module 12 may include either a non-rechargeable power source such as one or more alkaline batteries, or a rechargeable source. In devices where the first communication module 12 includes a rechargeable power supply, the power supply is preferably recharged through an operative connection to a recharging

device, such as a cradle or holding unit. The device 10 could also be adapted to receive a connector jack or plug from a more common wall-mounted type charger device.

With reference again to Fig. 5, the second communication module 14 preferably includes a rechargeable power source that is charged through the recharging terminals 46 and 56 described above. It should be understood, however, that the second communication module 14 may alternatively include a single use power source, such as a non-rechargeable battery, making charging terminals 46 and 56 unnecessary

Figs. 6-8 show an alternative communication device 60 embodiment in which a second communication module 64 may be mounted to a first communication module 62 in either an operative or inoperative position. Fig. 6 is a bottom perspective view of the communication device 60 showing operative-mode connection terminals 66 on the second communication module 64. Fig. 7 is a bottom perspective view of the first communication module 62 showing both operative-mode connection terminals 68 and inoperative-mode connection terminals 46. Fig. 8 is a bottom perspective view of the second communication module 64 showing inoperative-mode connection terminals 56.

When the second communication module 64 is mounted in an inoperative assembled position, the inoperative-mode terminals 46 in the first communication module 62 are electrically connected with the inoperative-mode terminals 56 on a front wall 64b of the second communication module 64, as shown in Fig. 8. In the inoperative assembled position, the inoperative-mode terminals 46 and 56 preferably operate as described above to charge a power source in the second communication module 64.

When the second communication module 64 is mounted in an operative assembled position, the operative-mode connection terminals 68 in the cavity of the first communication module 62, shown in Fig. 7, are electrically connected with the operative-mode connection terminals 66 on a back wall of a main body portion of the second communication module 64

shown in Fig. 6. In this operative assembled position, the speaker 64a and microphone 64d, shown in Fig. 8 face away from the cavity and are accessible for use by a user of the communication device. In addition, the operative-mode terminals 66 and 68 provide for simultaneous charging and use of the second communication module 64. For instance, the operative-mode terminals 66 and 68 may provide for operation of the second communication module 64 from the power source of the first communication module 62, while simultaneously charging the power source of the second communication module 64. The operative assembled position of the second communication module 64 thus provides for use of the second communication module 64 when its power source is incapable of supplying sufficient power, and thereby avoids recharge down time.

Any of the retaining means discussed above could be used to mount the second module 64 in the operative position. For example, a friction fit between the main body 64b of the second communication module 64 and the corresponding cavity in the first communication module 62 will preferably retain the second module 64 in its assembled inoperative position. The main body 64b, or at least a part thereof, could then be fabricated such that the back portion, in which terminals 66 are positioned, and the front portion are substantially symmetric. The second communication module 64 may then be retained in either its operative or inoperative assembled position within the cavity in the first communication module 62. A similar arrangement could alternatively be implemented based on friction fit retention of the boom portion 64c of the second communication module 64.

Figs. 9 and 10 show another embodiment 61 of a communication device in which a second communication module 65 may be mounted to a first communication module 63 in either an operative or inoperative position, and the first communication module 63 utilizes only one set of multifunctional connection terminals 67. Fig. 9 is a bottom perspective view of the first communication module 63 showing the multifunctional connection terminals 67.

Fig. 10 is a bottom perspective view of the second communication module showing a set of charging terminals 69. One function of the connection terminals 67 on the first communication module 63 may be to cooperate with the charging terminals 69 positioned on the second communication module 65 in order to supply power to a rechargeable power source in the second communication module 65 while it is mounted in the inoperative position. In addition, the multifunctional connection terminals 67 may also contact a second set of terminals on the top face of the second communication module 65 (as shown in Fig. 6) when the second communication module 65 is mounted in its operative assembled position. The multifunctional connection terminals 67 may then provide for simultaneous charging and use of the second communication module 65 while it is mounted in its operative position.

Fig. 11 is a bottom perspective view of an exemplary communication device 70 having a first and second communication module 72 and 74, in which the first communication module includes a protective movable door 76. The protective movable door 76 is preferably fabricated from the same or similar material as the housing of the first communication module 72, and is positioned on a surface adjacent the cavity in which the second communication module 74 is mounted in its inoperative assembled position. The door 76 is normally in a closed position protecting the second communication module 74 and connection terminals 78 (if present), and is movable to allow detachment of the second communication module 74 from the first communication module 72. Then, when the second communication module 74 is detached from the first communication module 72, the door 76 may be moved to its closed position to substantially cover the cavity 80 in the first communication module 72.

The door 76 may be attached to the first communication module 72 through any appropriate hinge arrangement, and is preferably biased toward its open and closed positions. For instance, if an over-center spring or elastic biasing hinge arrangement is utilized, the door

76 is preferably biased toward its open position when the door 76 is opened beyond some point in its range of motion, and is otherwise biased toward its closed position. In addition, the door 76 may also include a fastening means or locking mechanism for maintaining the door in its closed position. Other specific ranges of motion are also contemplated in accordance with this aspect of the invention, including but not limited to a downwardly or sideways swinging door or a similar sliding door or covering panel.

Although intended primarily for protecting the second module 74 when it is mounted on the first module 72, the door 76 may also serve a decorative purpose. If fabricated from the same material as the housing of the first module 72, which is typically opaque, the door may, for example, be molded or otherwise worked to bear an emblem, a logo, a user identifier or the like, as shown at 79 in Fig. 12. Alternatively, the door 76 may be fabricated from a transparent material and adapted to receive a decorative member such as a photograph, allowing a user to customize the appearance of the communication device according to personal taste and preference.

Fig. 13 shows another exemplary communication device 80 in which a first communication module 82 includes a substantially enclosed cavity 86 into which a second communication module 84 is mounted. Preferably, the second communication module 84 is mounted by sliding it into the cavity 86 in a direction indicated by the dotted line 94. The first communication module 82 and second communication module 84 preferably include suitable retaining means for removably holding the second communication module 84 within the cavity 86.

The communication modules 82 and 84 may be adapted for operation in accordance with any of the embodiments described above. For instance, if the device 80 provides for an operative assembled position of the second communication module 13, then an opening 92, preferably comprising a series of slits as shown in Fig. 13, may be provided at an appropriate

position in a wall of the housing of first communication module 82. Preferably, the slits are positioned to correspond to the position of a microphone 84d when the second communication module 84 is in its operative assembled position. Depending on the particular operative assembled position of the second communication module 84, a further opening similar to opening 92 could be provided for a speaker 84a. Alternatively, the operative assembled position could be designed such that the speaker 84a remains outside the cavity 86.

In addition, a set of contact terminals 88 on the second communication module 84 may cooperate with suitably located terminals inside cavity 86 to provide for recharging of a power source in the second module 84 and/or powering the second module 84 from the power source in the first module 82. In an alternative embodiment, a set of female terminals 90 may be located at a bottom edge of the main body 84b of the second communication module 84 that engage and electrically connect to corresponding male terminals inside the cavity 86.

Each of the above exemplary embodiments include a general first communication module. This first communication module may, for example be a handheld electronic device as disclosed in United States Patent Application No. 09/106,585, which is hereby incorporated into the present Application by reference. It should be understood, however, that the first communication module is not limited to such a handheld electronic device. For instance, Figs. 14a and 14b respectively show exemplary embodiments 100 and 110 in which the first communication module is a cellular telephone 102 and a laptop computer or PDA 112. In Fig. 14a, a second communication module 104 is removably assembled in a cavity 106 in the cellular telephone 102. Similarly, the laptop computer or PDA 112 shown in Fig. 14b includes a mounting location 116 in which a second communication module 114 may be attached. Any of the above terminal and mounting arrangements, including, for example, a

protective door or an enclosed cavity in which the second communication modules 104 or 114 would be slidably mounted, are also contemplated for the devices 100 and 110.

Figs. 15a and 15b show one alternative design 120 for the second communication module. Fig. 15a shows a top perspective view of the alternative second communication module 120. Fig. 15b shows a side perspective view of the alternative second communication module 120. The alternative communication module 120 preferably includes a housing 128, a speaker 120a, a microphone 120d and a switch 126. The housing 121 preferably includes a substantially oval-shaped top profile, and indentations 122 and 124 that define handles by which a user may grasp and hold the second communication module 120. In addition, the housing 121 preferably has a main body portion with two sections: an upper section 120b that lies substantially to one side of the speaker 120a; and a lower section 120c that lies substantially on the opposite side of the speaker 120a. The microphone 120d is preferably located at a distal end of the lower section 120c. The switch 126 is preferably located on a top portion of the housing 121 and operates similarly to the switch 54 shown in Fig. 5. The module may also include an additional microphone adapted to receive background noise for use in executing noise cancellation operations for the desired but corrupted voice or audio signals received at microphone 120d.

Like the second communication modules described above, the alternative module 120 communicates via a wireless link with an associated first communication module and is designed to provide for hands-free operation. The speaker 120a is placed in a user's ear such that body section 120c and thus microphone 120d extend toward the user's mouth. Extension of the upper and lower main body sections 120b and 120c on opposite sides of the speaker 120a allows for effective weight balancing. A further feature of the alternative second communication module 120 involves a raised portion 128 that overlies the upper and lower main body sections 120b and 120c. The raised portion 128 is preferably a removable cover

member that provides simple access to manufacturer-selected internal components, such as a single-use replaceable battery, for service or installation by a user.

FIG. 16 is an exemplary electrical block diagram 160 of the multi-module communication devices shown in FIGs. 1-15. Another type of communication device that could be modified for use with this system is described in co-pending United States Patent Applications S/N 09/106,585, 09/344,432, 09/543,231, 09/634,774 and 09/663,972. These applications, which are co-owned with the present application, are hereby incorporated herein by reference. The communication devices described in these applications include only a single wireless RF component for communicating over a single communication path to a long-range wireless network. The devices shown in FIGs. 1-15 are similar to these devices in that they can communicate over a long-range wireless network, but also preferably include an RF interface for communicating over a short-range wireless network or link.

The communication devices 160 shown in FIGs. 1-15 preferably comprise a first communication module 161 and a second communication module 162. The first communication module 161 preferably includes a pair of antennas 164, 166 (although a single antenna structure could be used), a processor 174, a memory 172, an LCD display 180, at least one rechargeable battery 184, a long-range RF transceiver 168, one or more short-range RF transceivers 170, a power supply and recharging circuit 186, a cradle interface circuit 182, and one or more input devices, including, preferably, a keyboard 176 such as described in the above mentioned co-pending applications and a thumbwheel 178. The first communication module 161 may also include a pressure-sensitive writing tablet.

The input devices 176, 178 on the first communication module 161 are preferably used to respond to and generate messages, such as email messages. The first communication module 161 preferably interfaces with a belt-worn holster for receiving the first communication module 161 and securing it to a user's belt. The long-range RF transceiver

168 is used to send and receive information from the long-range wireless network, and the one or more short-range RF transceivers 170 are used to send and receive information from the second communication module 162, and possibly from other local devices such as an RF interface cradle.

The second communication module 162 is preferably an RF-enabled ear-piece that may be connected to (both mechanically and electrically) the first communication module 161 as described above. The second communication module 162 preferably includes a microphone and a speaker 190, a short-range wireless transceiver 192, an antenna 194, a rechargeable battery 188, and possibly an integral processor 196. The second communication module 162 may also include a background noise microphone 48 and a noise cancellation circuit 191 as described above with reference to Fig. 4. When the second communication module 162 is placed into the first communication module 161, a shared secret can be exchanged between the two wireless components of the communication device 160 so that any communications between the first and second communication modules 161/162 may be encrypted. Also, the rechargeable battery 188 of the second module 162 may be recharged by the battery 184 of the first communication module 161 through power supply recharging circuitry 186 when the two modules are in electrical contact.

In other embodiments, the communication device 160 may include a camera component for displaying or sending video images to the communication device user, or could include sensory circuits for monitoring the communication device user's vital information such as pulse and blood pressure. In these embodiments a nurse or doctor in a hospital floor could wear the first component, while the second might be in a patient's room monitoring some vital statistics. The short-range communication in this example might reach several hundred feet and several second components might be communicating to a single first

component. This information could then be relayed on from the first component worn by the nurse or doctor to a central nursing station for all nurses on duty to see and monitor.

Fig. 17 illustrates one contemplated implementation 200 of the communication device described above, wherein 212 denotes the first communication module and 214 is the second communication module. In this system 200, the first communication module 212 and second communication module 214 incorporate compatible short-range communication systems. This allows wireless communications between the first and second modules 212 and 214 over a short-range RF link 216. The first communication module 212 is also designed for communication over a wireless link 218 with a long-range wireless communication network 220. In this implementation 200, the first communication module 21 is preferably a mobile communication device such as a cellular telephone, a two-way pager or communications-enabled PDA, which would normally be carried by users in or on a belt clip or holder, or in a briefcase or purse.

The second communication module 214 is preferably a relatively low cost item, such that a user of a multiple-module device could purchase and suitably configure several second communication modules 214 for use with a single first communication module 212. The different second communication modules 214 could preferably be purchased "off-the-shelf" and then configured, for example, through an over-the-air registration process executed under user control of the first communication module 212.

The basic system 200 could be expanded in accordance with a further embodiment shown in Fig. 18 to include wireless communication between the device modules 212 and 214 and a third module 234, such as an RF interface cradle. If the first communication module 212 includes a rechargeable power source, then the third module 234 may be a docking station or cradle into or upon which the first module may be removably placed in order to recharge its power source. If the second communication module 214 is also powered

by a rechargeable source, then the second module 214 may also be recharged by mounting the fully assembled multiple-module communication device on the third module 234. A more detailed illustration of the third module 234 is shown in Fig. 18a.

The third module 234 is preferably adapted for short-range communications with either the first communication module 21 over the a short range RF link 236, the second communication module 214 over another short range RF link 238, or both. Many possible uses of such the additional short range RF links 236 and 238 are possible. For instance, the third module 234 may be connected to a desktop computer 232 as shown in Figs. 18 and 18a to expand the capabilities and potential applications of multiple module communication devices. The wireless links 236 and 238 may then be used to carry data and audio signals between the user and the computer 232, as well as any wired network 234 and associated components to which the computer is connected. Although shown as separate components in Figs. 18 and 18a, the third module 234 could alternatively be integrated into the computer 232.

Communication between the multiple-module device 212/214 and the computer 232 provides for countless possible functionality options, such as simple paging and other notification, remote- and voice-activated computer and peripheral control and wireless file or information downloading and uploading. This system may also be further expanded to include network communications between the first and second communication modules 212 and 214 and wired network 234 through the PC 232 to incorporate connectivity via small pico-cell networks. In such an implementation, each third module 234 connected to a corporate or other local area network such as the wired network 234, could be adapted to perform pico-cell base station functions. Each such "base station" third module 232 could, for example, then be configured for short-range communication with the first and/or second communication modules 212 and 214 of all multiple-module communication devices issued

to corporate employees. For communications between corporate users within the range of the pico-cell network, all device functions may then be performed without using the long-range wireless network 220, potentially generating significant cost savings. A further extension of the communication systems according to the above embodiments could be a personal area network (PAN).

Many different possibilities for inter-module communications features are also possible. For instance, if the first communication module 212 is a cellular telephone, then the second communication module 214 may provide a hands-free means for a user to answer and participate in a voice call received at the cellular telephone. If the modules were adapted for voice control, a cellular user may preferably initiate a telephone call, add a telephone number to a stored number list, cause the telephone to enter a locked mode, or control execution of other functions by the first module by simply speaking into the microphone of the second communication module 214.

If the first communication module 212 is enabled for data communication, then the second communication module 214 may expand its functionality. For instance, if the first communication module 212 is based on a data communication device, such as a two-way pager or a wireless modem in a laptop computer, then the addition of the second communication module 214 will enable voice communications in a device which was previously enabled only for data communication. A multiple-module communication device in accordance with this aspect of the invention can provide simultaneous voice and data communications. For example, a user that is participating in a voice communication using the second communication module 214 would preferably be able to simultaneously transmit data to the other party to the call through the first communication module 212.

The embodiments described herein are examples of structures, systems or methods having elements corresponding to the elements of the invention recited in the claims. This

written description may enable those skilled in the art to make and use embodiments having alternative elements that likewise correspond to the elements of the invention recited in the claims. The intended scope of the invention thus includes other structures, systems or methods that do not differ from the literal language of the claims, and further includes other structures, systems or methods with insubstantial differences from the literal language of the claims.

We claim:

1. A communication device, comprising:

a first communication module having a housing with a cavity defined therein, and also having a first RF transceiver for communicating with a wireless network and a second RF transceiver, wherein the first communication module is configured to transmit and receive RF signals to and from the wireless network; and

a second communication module physically proportioned to be detachably mounted within the cavity of the first communication module and also to be fitted into or onto an ear of a communication device user, and comprising an RF transceiver configured to transmit and receive RF signals to and from the first communication device, a microphone coupled to the RF transceiver, and a speaker coupled to the RF transceiver, wherein the second communication module is configured to communicate with the second RF transceiver of the first communication module when the second communication module is physically detached from the cavity of the first communication module.

2. The communication device of claim 1, further comprising:

a rechargeable power source coupled to the RF transceiver, microphone and speaker in the second communication module;

a first set of terminals coupled to the rechargeable power source on the second communication module;

a second set of terminals located within the cavity of the first communication module and coupled to a power source;

wherein the first set of terminals is electrically and physically coupled to the second set of terminals while the second communication module is mounted within the cavity of the

first communication module in order to charge the rechargeable power source in the second communication module.

3. The communication device of claim 2, wherein the power source coupled to the second set of terminals in the first communication module is a power supply circuit coupled to a battery.

4. The communication device of claim 1, wherein the first RF transceiver in the first communication module is a long-range RF transceiver.

5. The communication device of claim 1, wherein the second RF transceiver in the first communication module and the RF transceiver in the second communication module are short-range RF transceivers.

6. The communication device of claim 1, wherein the first communication module is configured to be worn on a belt of the communication device user.

7. The communication device of claim 1, wherein the second communication module further comprises a background noise microphone and a noise cancellation circuit coupled to both the microphone and the background noise microphone, and configured to detect background noise signals from the background noise microphone and remove the background noise signals from a speech signal received by the microphone to generate a filtered signal that is transmitted to the first communication module by the RF transceiver.

8. The communication device of claim 1, wherein the second communication module further comprises a power switch configured to turn the second communication module on or off while it is detached from the first communication module.

9. The communication device of claim 1, wherein second RF transceiver in the first communication module is configured to communicate with both the second communication module and a third module.

10. The communication device of claim 9, wherein the third module is coupled to a personal computer and is configured to transmit data between the personal computer and the first communication module.

11. The communication device of claim 9, wherein the third module is coupled to a computer network and is configured to transmit data between the computer network and the first communication module.

12. The communication device of claim 1, wherein RF transceiver in the second communication module is configured to communicate with both the first communication module and a third module.

13. The communication device of claim 1, wherein the first communication module is a cellular phone.

14. The communication device of claim 1, wherein the first communication module is a personal digital assistant (PDA).

15. The communication device of claim 1, wherein the first communication module is a laptop computer.

16. A communication device, comprising:

a first communication module comprising a housing with a cavity defined therein and a set of charging terminals located within the cavity, wherein the charging terminals are coupled to a power source; and

a second communication module comprising an outer housing, a speaker attached to the outer housing and physically dimensioned to be fitted into an ear of a communication device user, a microphone attached to the outer housing and positioned to extend substantially towards the communication devise user's mouth when the speaker is fitted into the ear of the communication device user, a rechargeable power source, and a set of terminals attached to a bottom surface of the outer housing and coupled to the rechargeable power source, wherein the second communication module is physically dimensioned to be detachably mounted within the cavity of the first communication module such that the terminals on the second communication module are physically and mechanically coupled to the charging terminals while the second communication module is mounted within the cavity in order to charge the rechargeable power source.

17. The communication device of claim 16, wherein terminals are recessed below a surface of the outer housing of the second communication module.

18. The communication device of claim 17, wherein the charging terminals located within the cavity of the first communication module protrude from a surface of the cavity in order to physically contact the recessed terminals in the second communication module.

19. The communication device of claim 16, wherein the power source coupled to the charging terminals in the first communication module is a power supply circuit coupled to a rechargeable power source.

20. The communication device of claim 16, wherein the power source coupled to the charging terminals in the first communication module is a power supply circuit coupled to a non-rechargeable power source.

21. The communication device of claim 16, wherein the second communication module further comprises a set of operational terminals attached to a top surface of the outer housing and coupled to the rechargeable power source, wherein the second communication module may be mounted in the cavity of the first communication module in either an inoperative position in which the charging terminals in the cavity are coupled to the terminals attached to the bottom surface of the outer housing, or an operative position in which the charging terminals in the cavity are coupled to the operational terminals attached to the top surface or the outer housing.

22. The communication device of claim 21, wherein the first communication module further comprises a second set of charging terminals, wherein the second set of charging terminals are coupled to the operational terminals of the second communication module while the second communication module is mounted in the operative position.

23. The communication device of claim 16, wherein the power source in the first communication module is a rechargeable power source, and wherein the first communication module is configured to be electrically and mechanically coupled to a third module in order to charge the rechargeable power source.

24. The communication device of claim 16, wherein the cavity in the first communication module is substantially enclosed such that the second communication module is detachably mounted within the cavity by sliding the second communication module lengthwise into the cavity.

25. A communication device, comprising:

a first communication module comprising a housing with a cavity defined therein; and

a second communication module comprising an outer housing, a speaker attached to the outer housing and physically dimensioned to be fitted into an ear of a communication device user, a microphone attached to the outer housing and positioned to extend substantially towards the communication devise user's mouth when the speaker is fitted into the ear of the communication device user, wherein the second communication module is physically dimensioned to be detachably mounted within the cavity of the first communication module;

wherein the first and second communication modules are configured to communicate over a wireless link when the second communication module is physically detached from the cavity in the first communication module.

26..The communication device of claim 25, wherein the cavity in the housing of the first communication module includes surfaces that are contoured to provide retention of the second communication module within the cavity.

27. The communication device of claim 26, wherein the contoured surfaces of the cavity include retention means that engage detents in corresponding surfaces of the second communication module.

28. The communication device of claim 25, wherein the first communication module includes a movable clip device that retains the second communication module within the cavity.

29. The communication device of claim 25, wherein the first communication module further comprises a protective door hingedly connected to the housing and extending over the cavity, wherein the protective door may be closed to cover the second communication module while it is mounted within the cavity.

30. The communication device of claim 29, wherein the protective door includes a locking mechanism.

31. The communication device of claim 25, wherein the cavity in the housing of the first communication module includes surfaces having depressions that enable the communication device user to grasp the second communication module while it is fitted within the cavity.

32. A communication device, comprising:

a first communication module configured to receive RF signals from a wireless network;

a second communication module that may be physically attached to the first communication module and that is coupled to the first communication module by a wireless link and is configured to receive the RF signals from the first communication module over the wireless link and convert the RF signals into an audible signal, wherein the second communication module is physically dimensioned so that it may be fitted into or onto an ear of a communication device user.

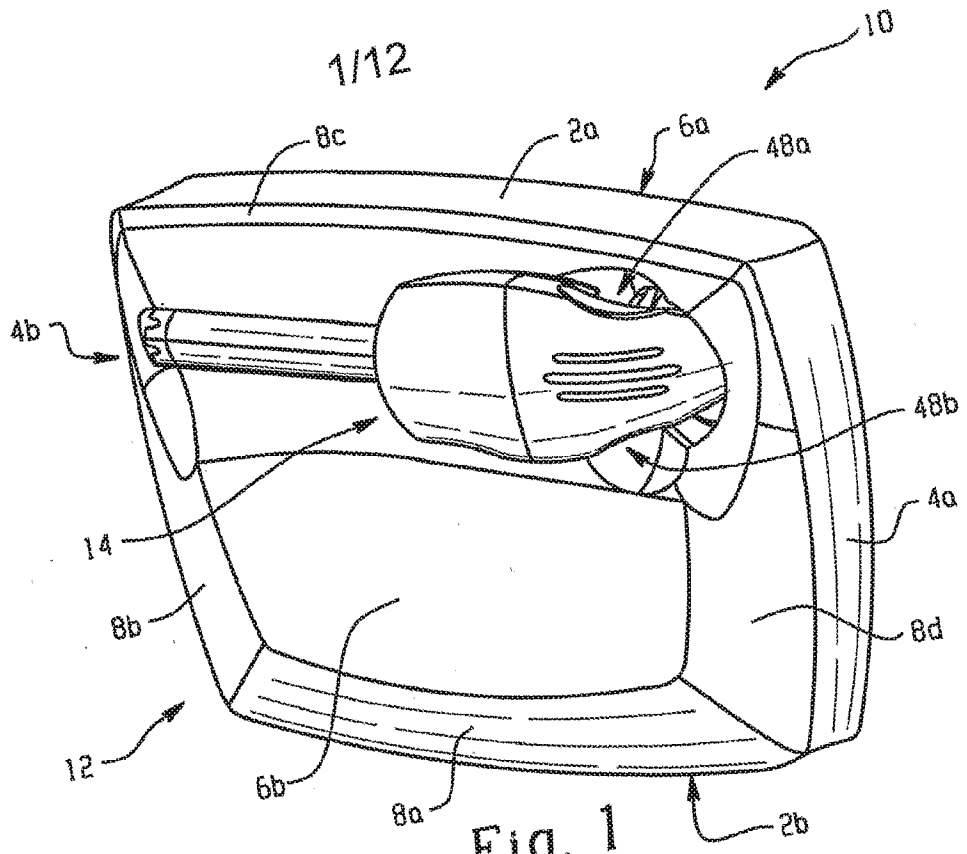

Fig. 1

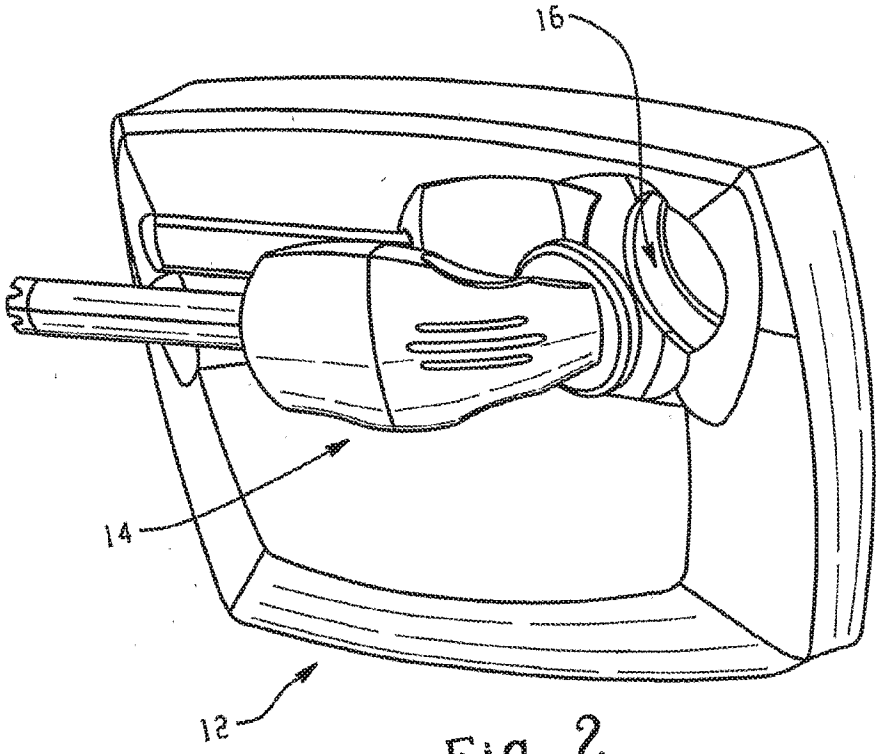

Fig. 2

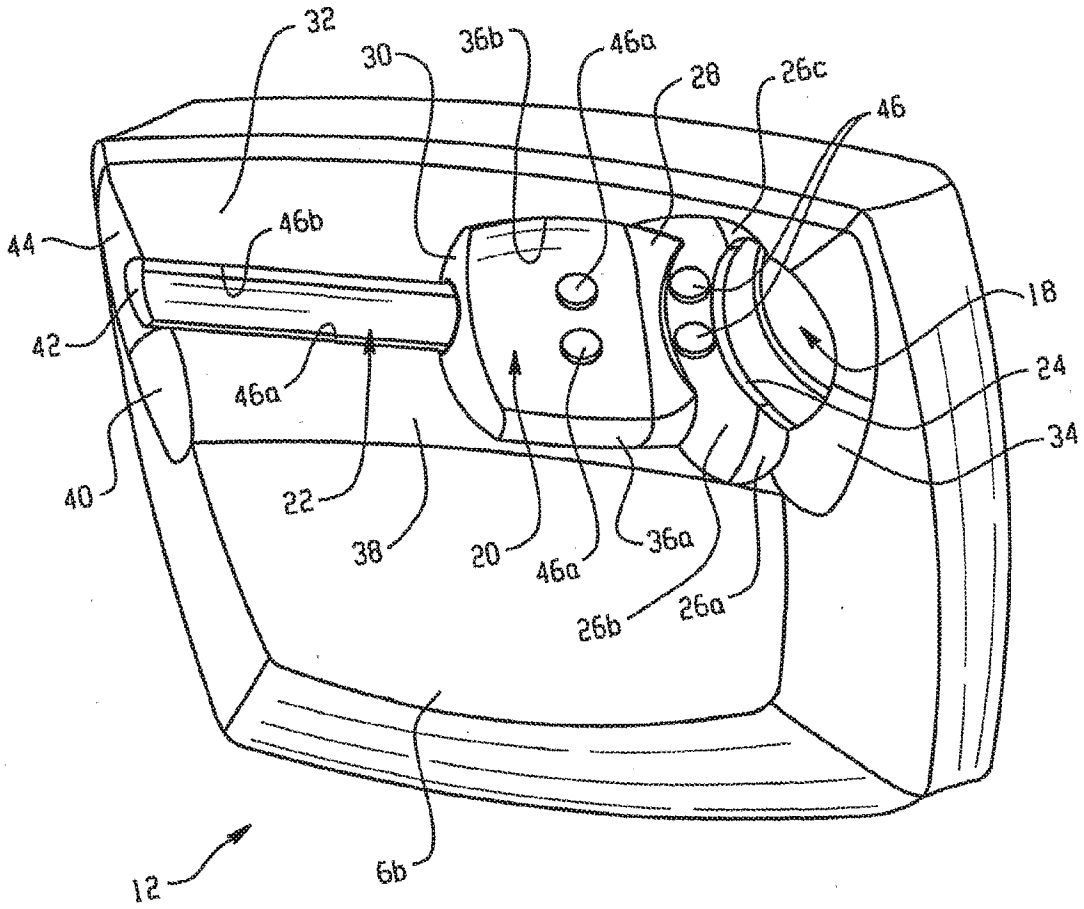
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Fig. 3

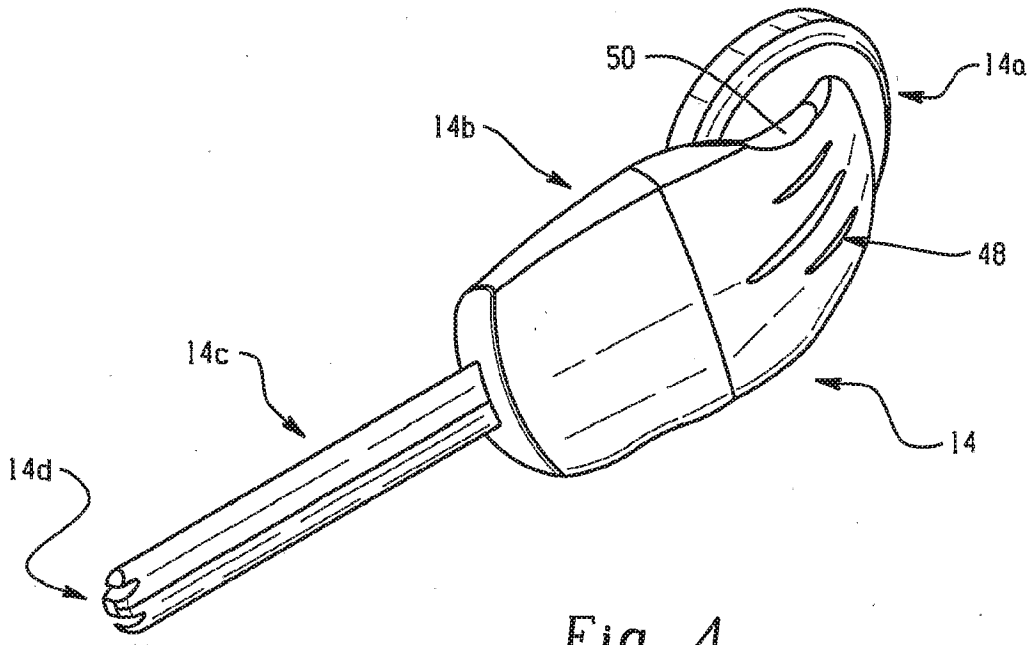

Fig. 4

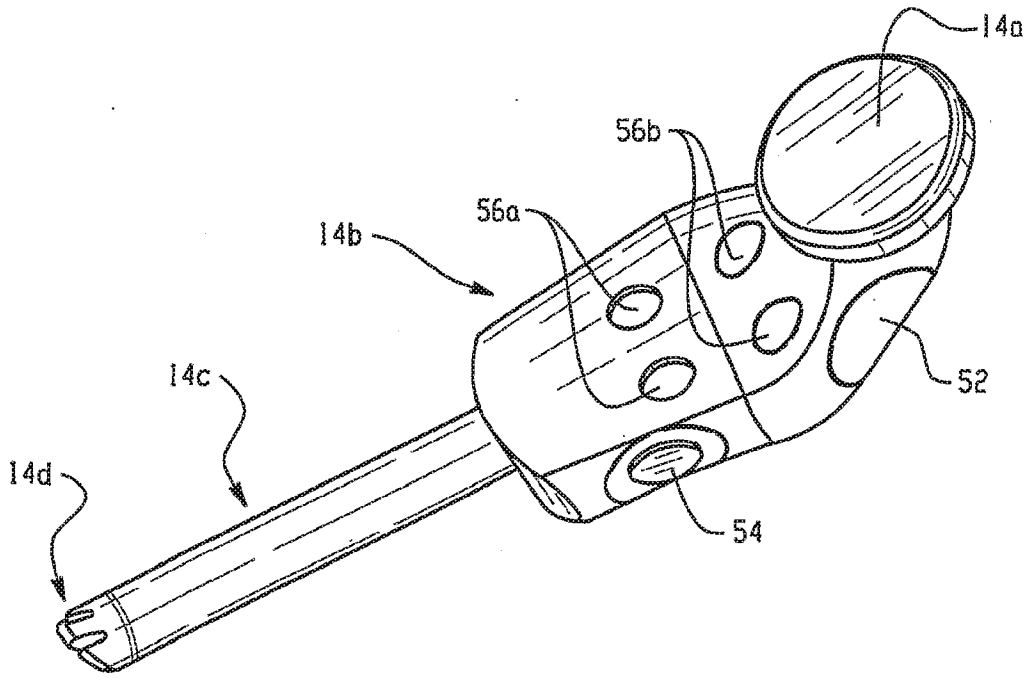

Fig. 5

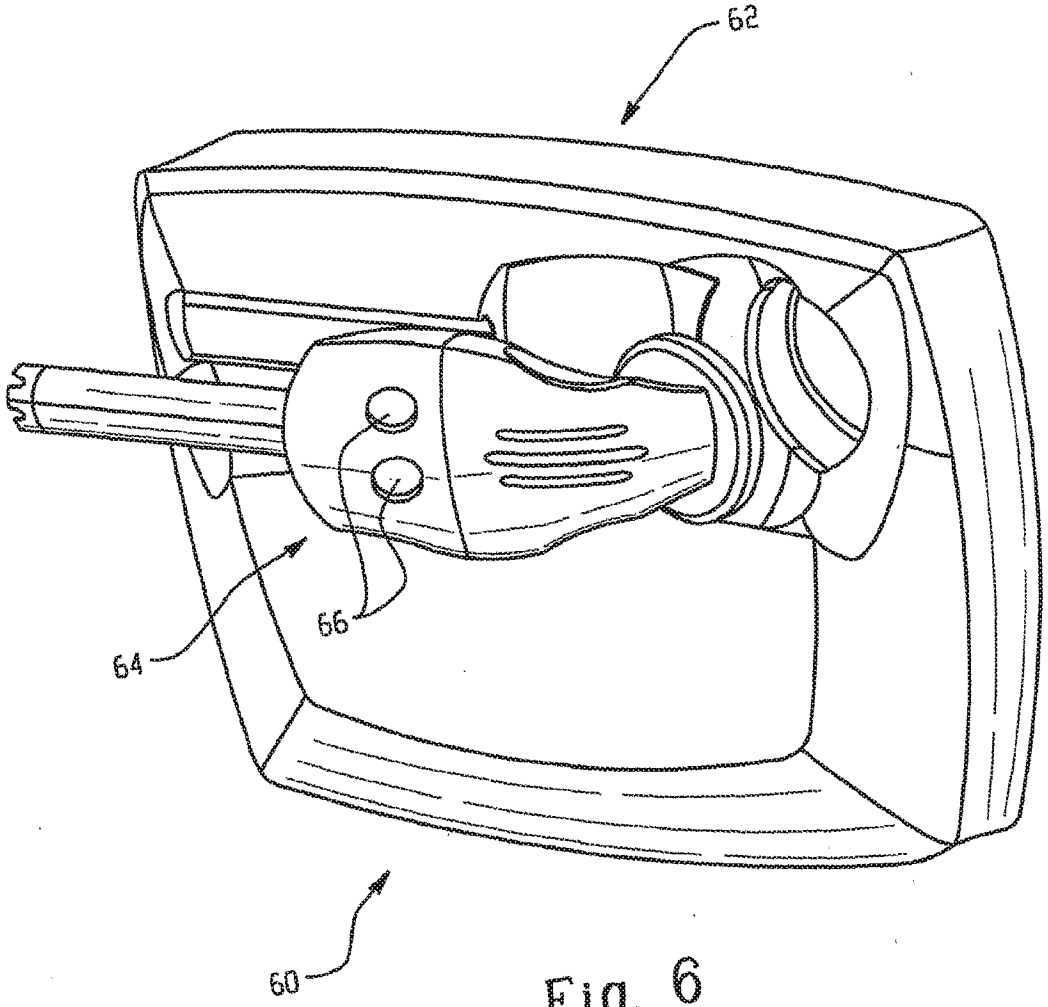

Fig. 6

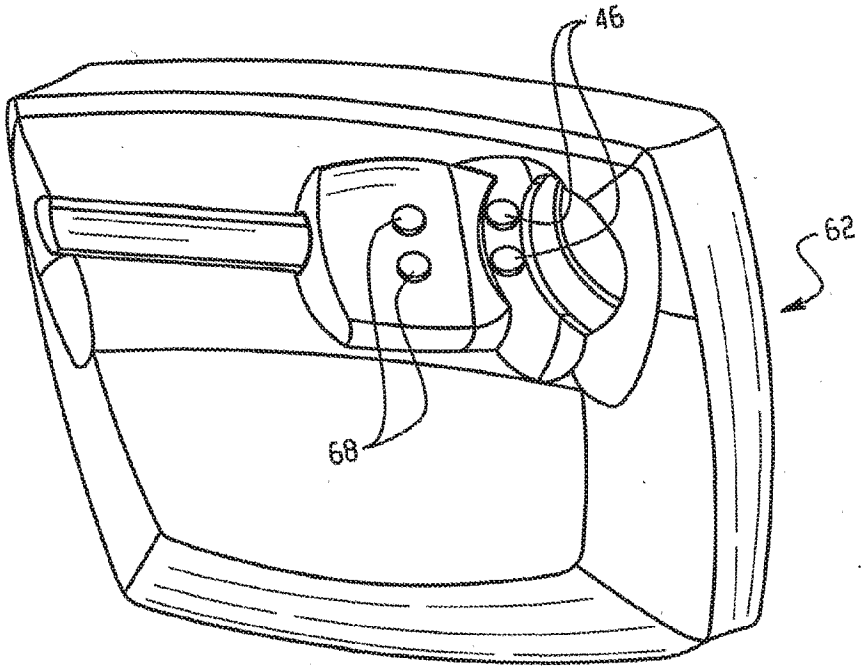

Fig. 7

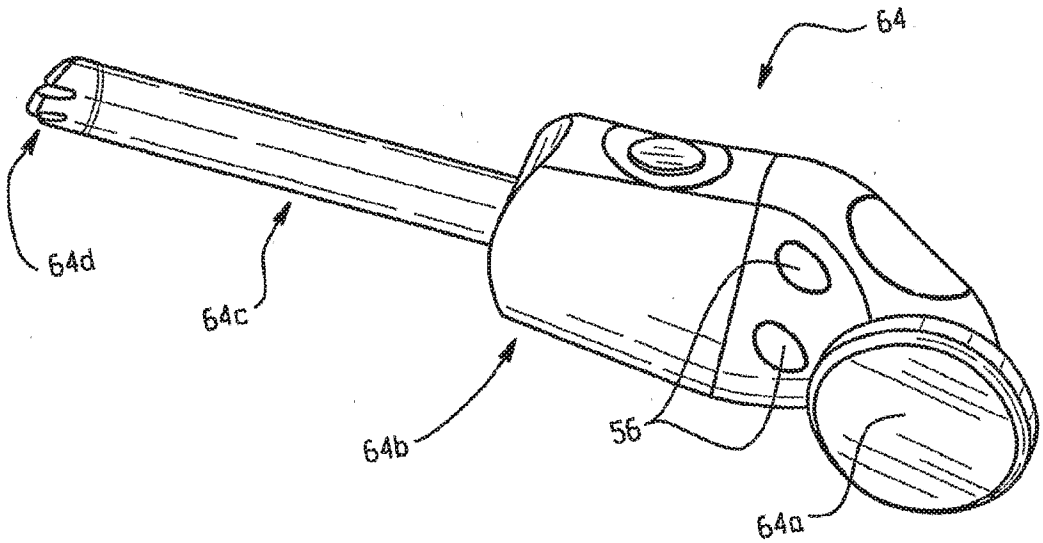

Fig. 8

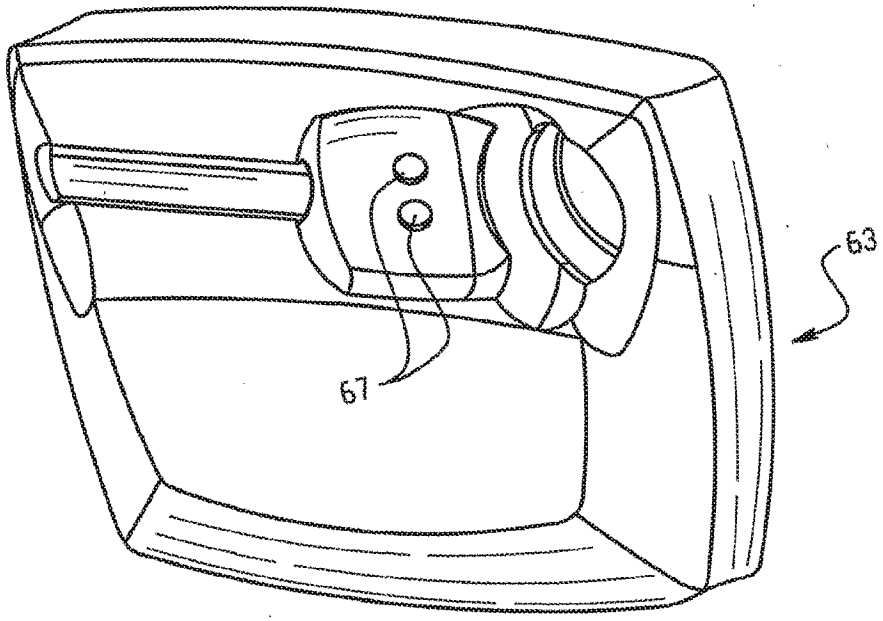

Fig. 9

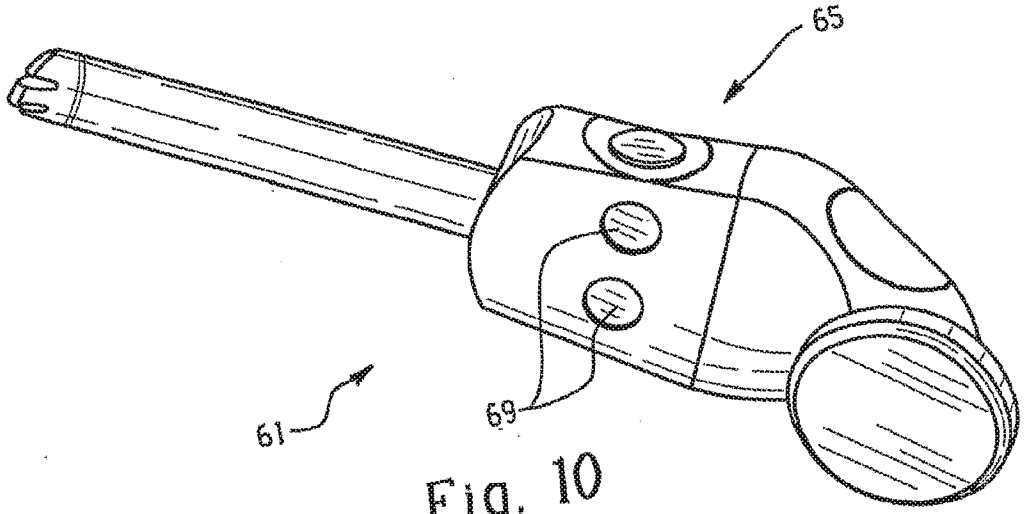

Fig. 10

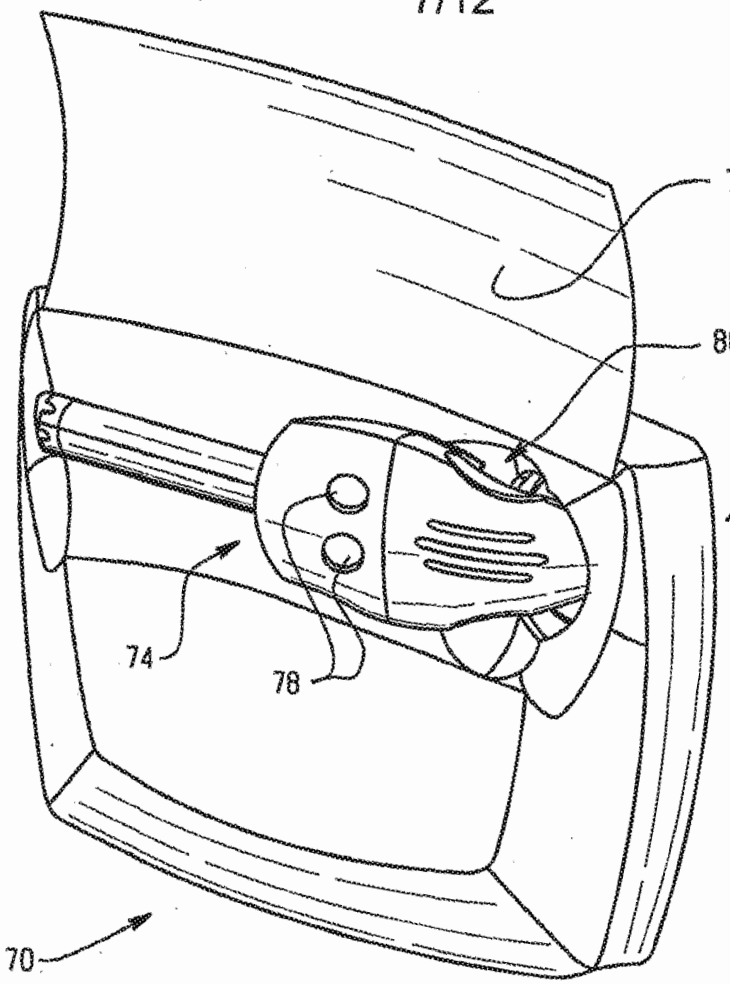

Fig. 11

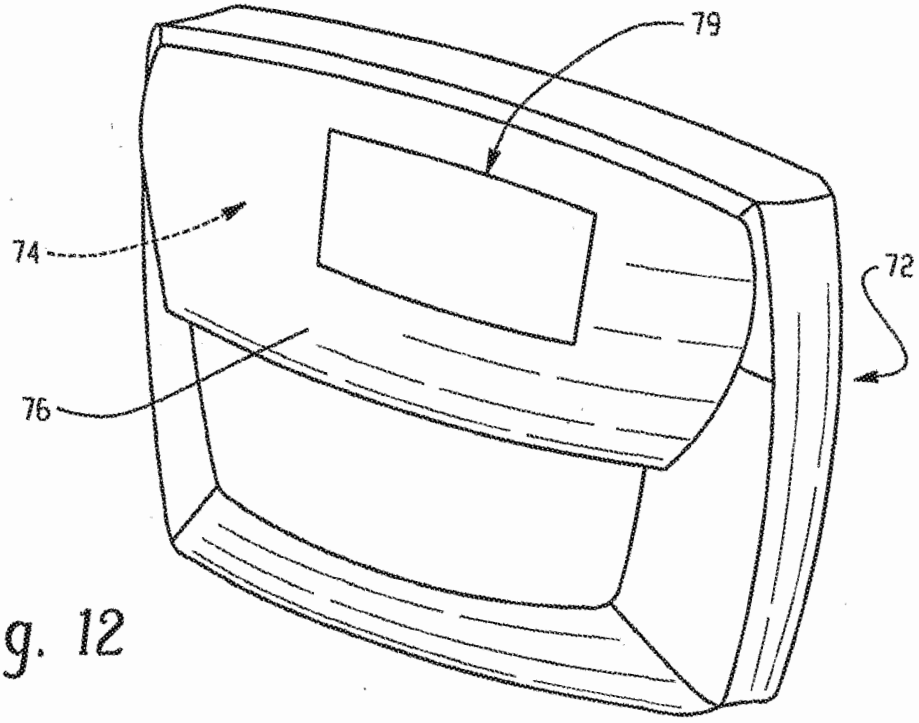

Fig. 12

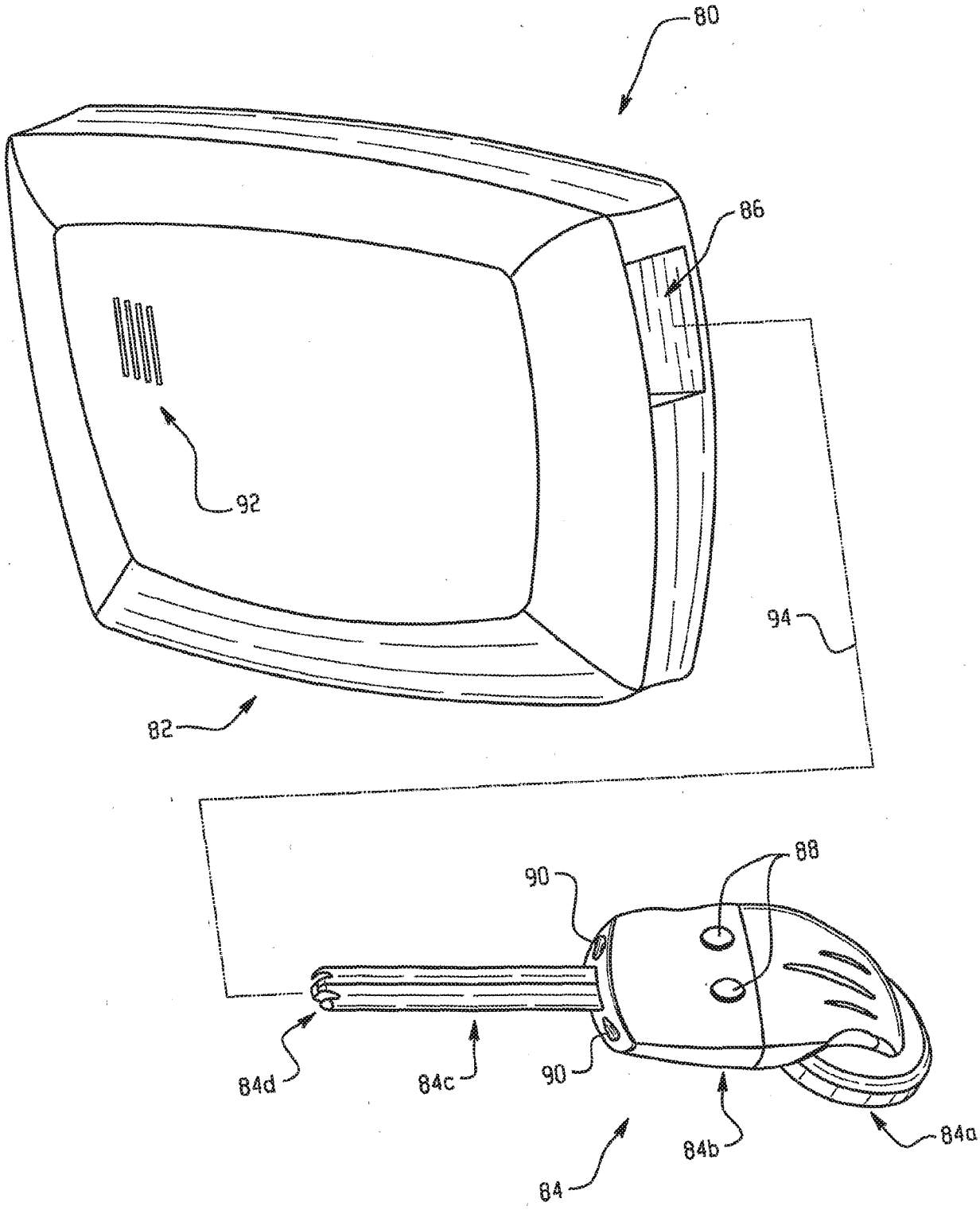

Fig. 13

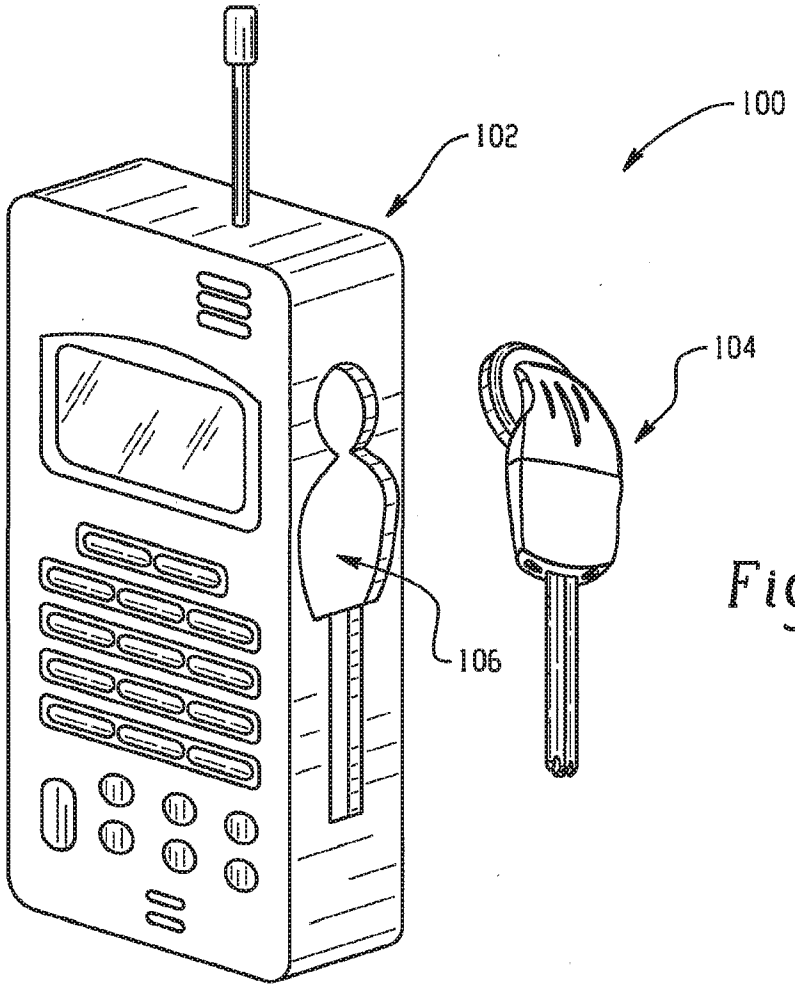

Fig. 14a

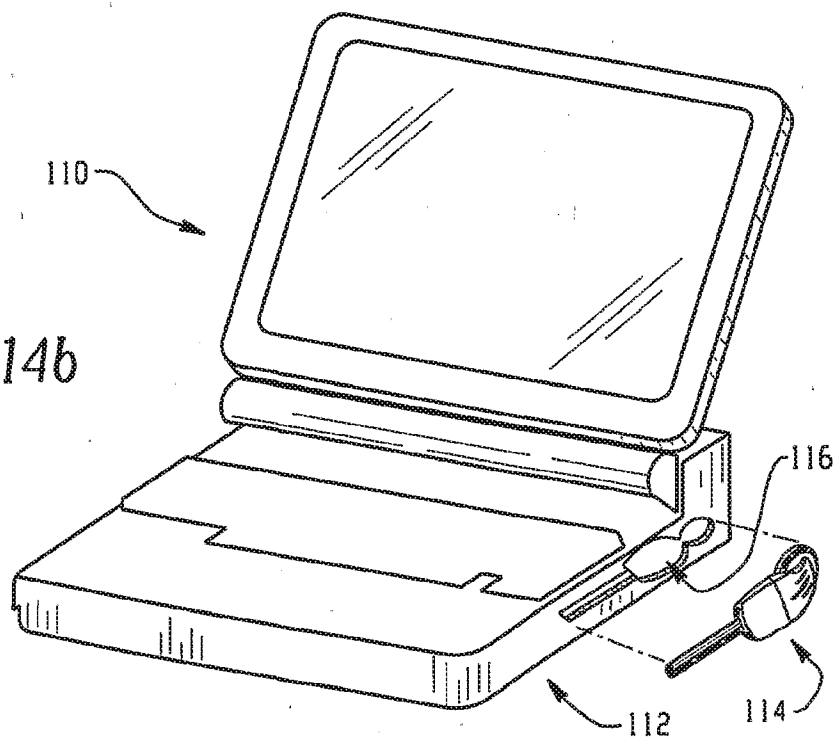

Fig. 14b

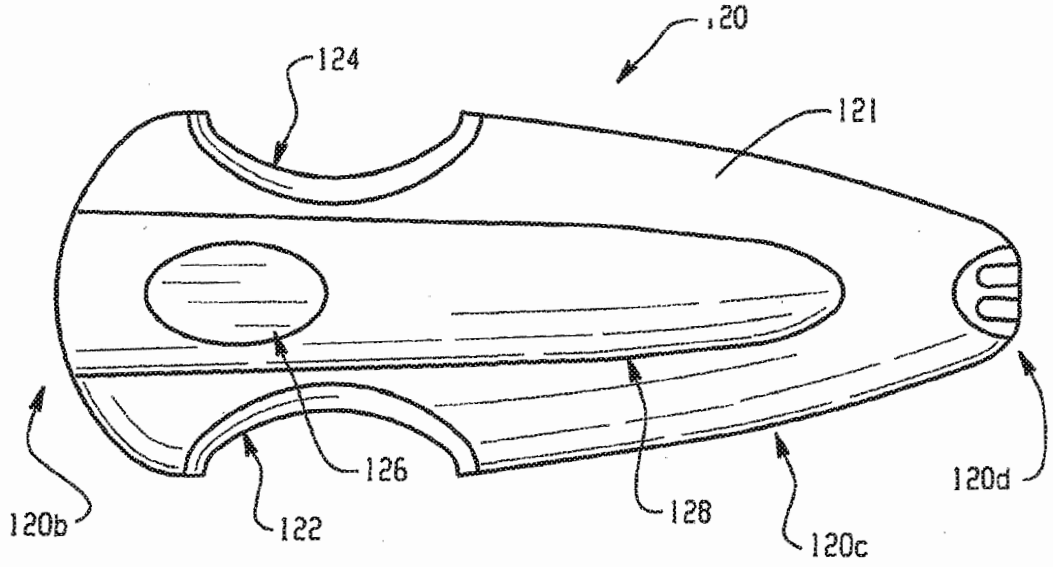

Fig. 15a

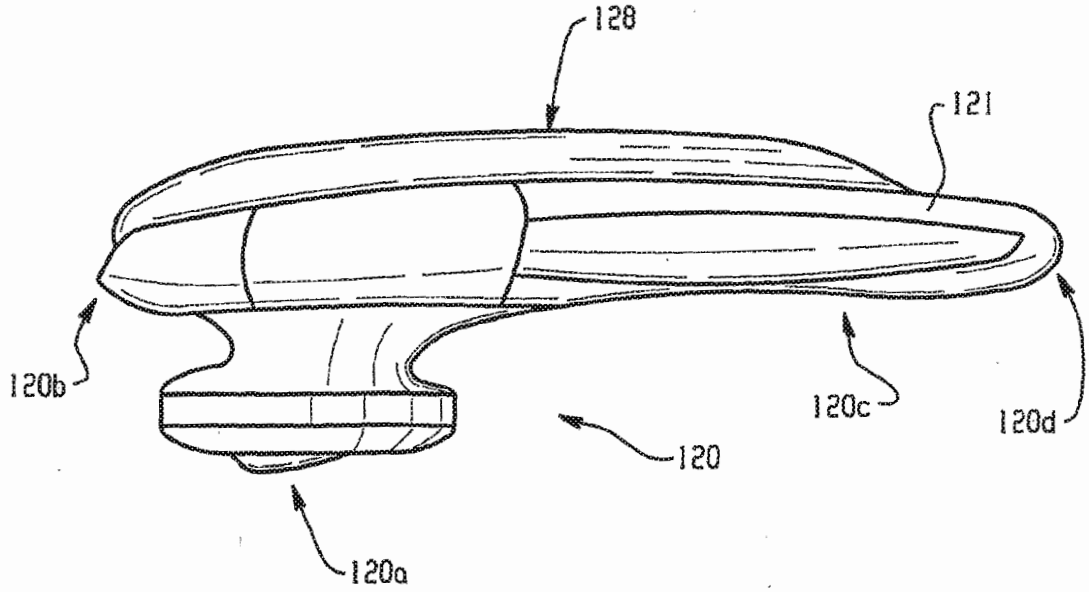

Fig. 15b

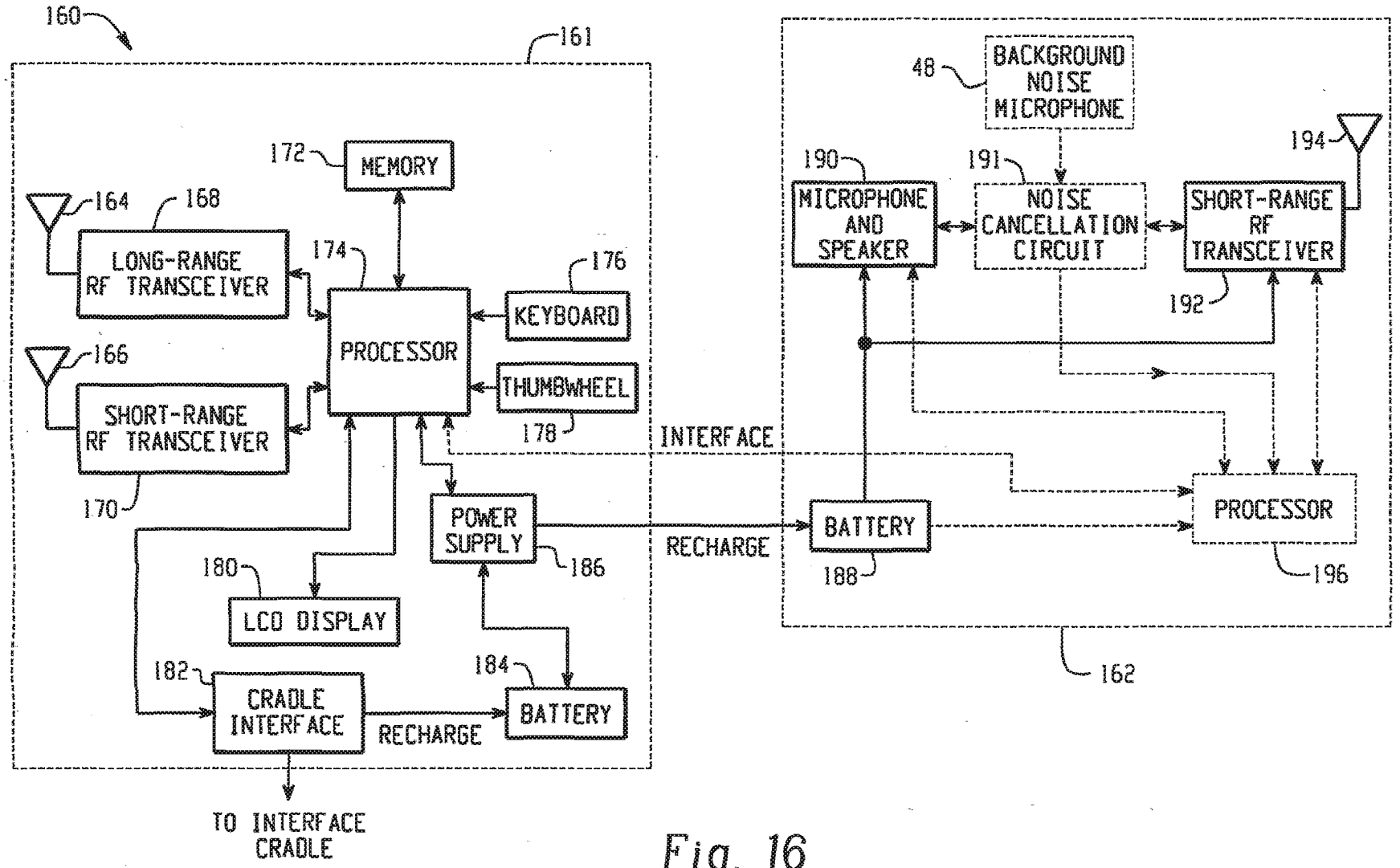
160
161
172
MEMORY
164
168
LONG-RANGE RF TRANSCEIVER
174
176
KEYBOARD
PROCESSOR
166
SHORT-RANGE RF TRANSCEIVER
THUMBWHEEL
178
170
INTERFACE
POWER SUPPLY
186
RECHARGE
180
LCD DISPLAY
182
184
CRADLE INTERFACE
RECHARGE
BATTERY
TO INTERFACE CRADLE
48
BACKGROUND NOISE MICROPHONE
190
191
194
MICROPHONE AND SPEAKER
NOISE CANCELLATION CIRCUIT
SHORT-RANGE RF TRANSCEIVER
192
BATTERY
188
PROCESSOR
196
162

Fig. 16

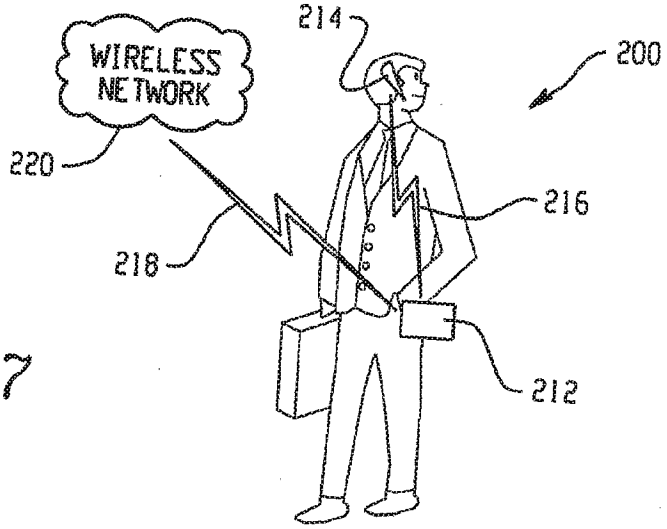

Fig. 17

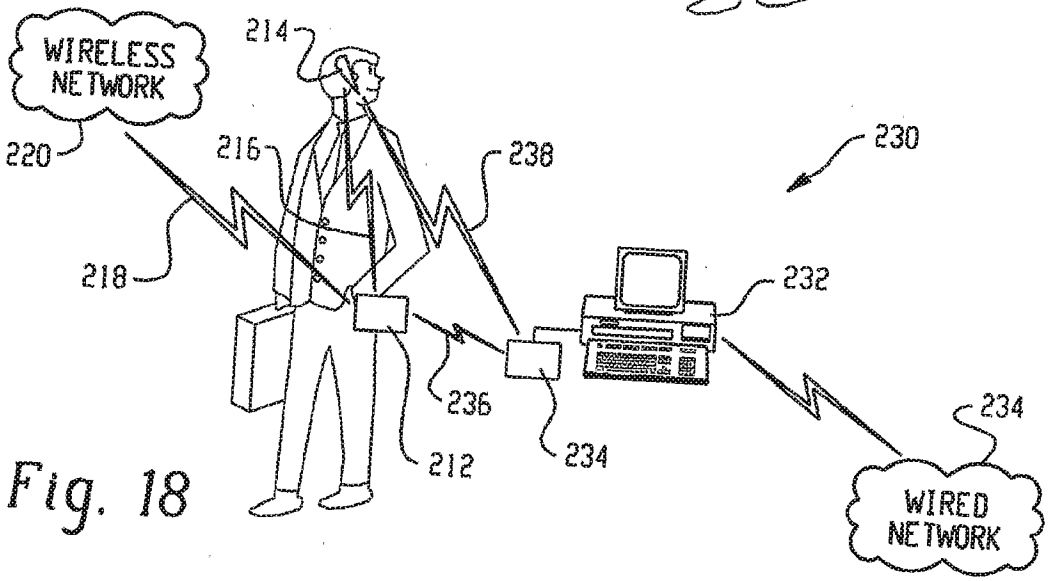

Fig. 18

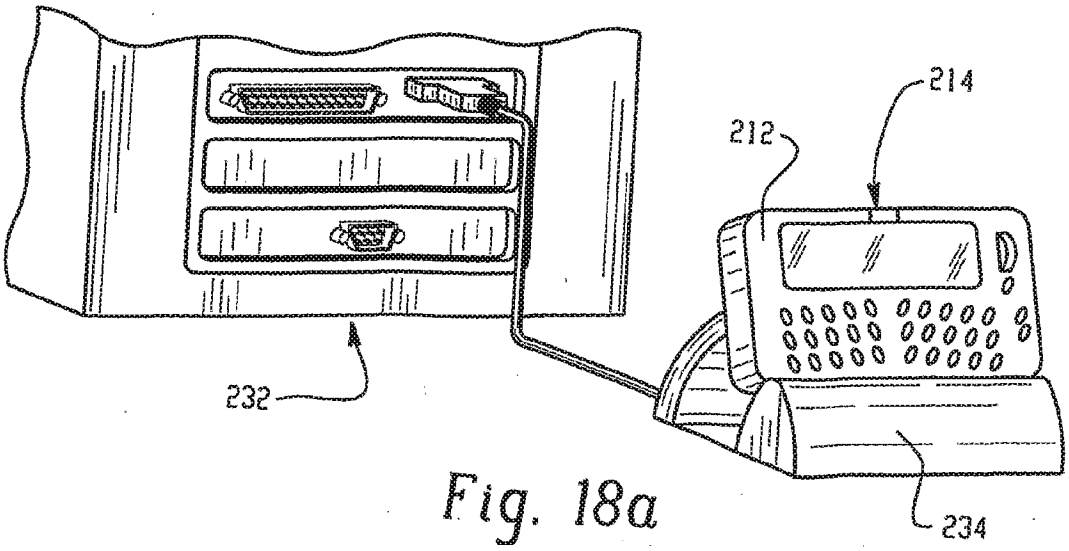

Fig. 18a

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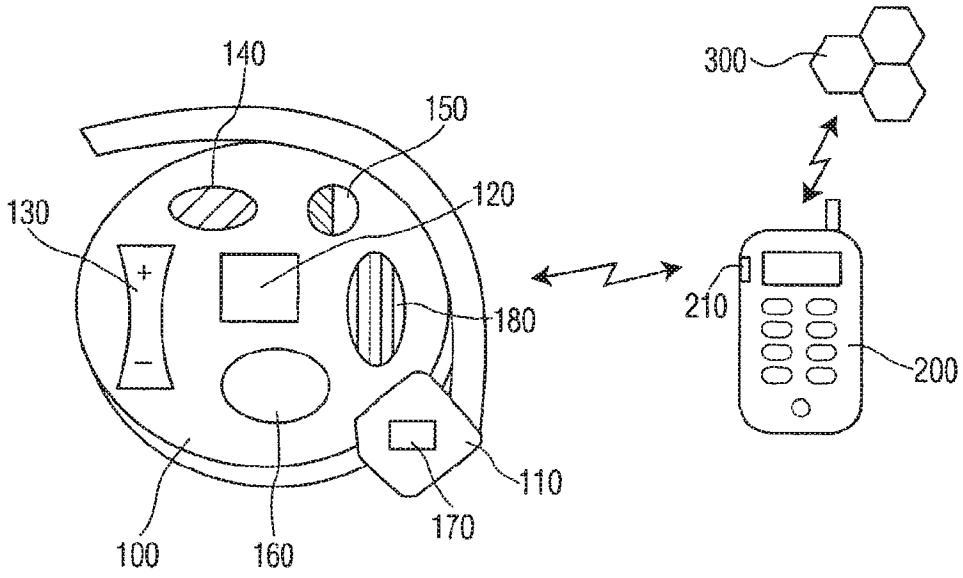
(54) Title: WIRELESS CONTROL DEVICE FOR MOBILE COMMUNICATION APPARATUS



(57) Abstract: A device is provided with a wireless module, a control user interface and a headset. The wireless module is configured to receive a downlink wireless signal from a portable communication apparatus over a first short-range wireless local area network. The wireless signal is representative of data received by the communication apparatus over a second wireless network. The control user interface is coupled to the wireless module. The control user interface enables to transmit control commands to the communication apparatus via the wireless module in response to respective user input commands. The headset is mounted on the device and is operably coupled to the wireless module. The headset automatically renders an audio signal to the user when the headset is detached from the device. The audio signal is derived from the downlink wireless signal.

WO 03/098901 A1

ES, FI, FR, GB, GR, HU, IE, IT, LU, MC, NL, PT, RO, SE, SI, SK, TR), OAPI patent (BF, BJ, CF, CG, CI, CM, GA, GN, GQ, GW, ML, MR, NE, SN, TD, TG).

Declarations under Rule 4.17:

— *as to applicant's entitlement to apply for and be granted a patent (Rule 4.17(ii)) for the following designations AE, AG, AL, AM, AT, AU, AZ, BA, BB, BG, BR, BY, BZ, CA, CH, CN, CO, CR, CU, CZ, DE, DK, DM, DZ, EC, EE, ES, FI, GB, GD, GE, GH, GM, HR, HU, ID, IL, IN, IS, JP, KE, KG, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MA, MD, MG, MK, MN, MW, MX, MZ, NI, NO, NZ, OM, PH, PL, PT, RO, RU, SC, SD, SE, SG, SK, SL, TJ, TM, TN, TR, TT, TZ, UA, UG, UZ, VC, VN, YU, ZA, ZM, ZW, ARIPO patent (GH, GM, KE, LS, MW, MZ, SD, SL, SZ, TZ, UG, ZM, ZW), Eurasian patent (AM, AZ, BY, KG, KZ, MD, RU, TJ, TM), European patent (AT, BE, BG, CH, CY, CZ, DE, DK, EE, ES, FI, FR, GB, GR, HU, IE, IT, LU, MC, NL, PT, RO, SE, SI, SK, TR), OAPI patent (BF, BJ, CF, CG, CI, CM, GA, GN, GQ, GW, ML, MR, NE, SN, TD, TG)*

— *as to the applicant's entitlement to claim the priority of the earlier application (Rule 4.17(iii)) for all designations*

Published:

— *with international search report*

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WIRELESS CONTROL DEVICE FOR MOBILE COMMUNICATION APPARATUS

[001] This application is a continuation-in-part of application, serial number 10/150,776, filed May 15, 2002, for "Bluetooth control device for mobile communication apparatus", hereby incorporated by reference. Reference is also made to copending application, serial number 10/150,253, filed May 15, 2002 for "Bluetooth cassette-like device for a hands-free cell phone kit", for the same assignee and same inventors (attorney docket US020126), herein incorporated by reference.

[002] The invention relates to a wireless area network device serving as an ancillary device to a wireless communication apparatus. The device may comprise a portable medallion recreating some basic user interface functionalities of the communication apparatus, e.g. voice input, sound output, volume control, communication channels control and the like.

[003] Using a cell-phone or a personal digital assistant may turn out to be very distracting or even dangerous for a user already busy doing something else e.g. driving, walking, biking or running. To solve this issue and reduce the potential risks, the wireless industry has launched several after-market products to free the user from holding the phone while making phone calls. For example, various headsets are manufactured with an earpiece connected to a microphone and most of these headsets or hands-free kits are compatible with any phone brand or model. A possible headset can be plugged-in to the phone and comprise a microphone connected via wires to the headset so that the microphone, when in position, can appropriately capture the voice of the user. Other headsets are built in with a wireless chip so that the voice conversation can be wirelessly diverted from the phone to the earpiece of the headset. Several solutions on the market are built based on the Bluetooth technology. The Bluetooth radio chip acts as a connector between the headset and another Bluetooth chip of the cell-phone. When the phone rings, the user can answer by simply pressing a key on the headset. Likewise, if the user wants to make a call, he may press a key on the headset and use voice recognition to initiate the call. The headset may also have a volume control to adjust the volume level of the earpiece. In addition to diverting the audio, these headsets often also permit to partially control the cell-phone or the communication apparatus associated with it.

[004] For example, the headset may comprise a voice command software application so that the user may remotely control his cell-phone by voicing the commands in a microphone of a control module. Such a wireless, voice-activated system to control an electronic device is disclosed in US patent US 6,339,706, incorporated herein by reference.

The remote control device permits to transmit control commands to the electronic device, which is possibly a phone, PDA or laptop over a wireless link being e.g. a Bluetooth link.

[005] United States Patent Application Publication US 2002/0021800, herein incorporated by reference, proposes a communication unit with a housing in which a transducer is placed and a microphone arm is suspended. The communication unit may be Bluetooth-enabled. The proposed communication unit permits to power up the communications links with another Bluetooth device such as a cellular phone handset. Software may be provided to detect this "on" detection and wake up the cell phone and establish a link under the Bluetooth or other linking signal. Furthermore, it is possible for the headset, via this detection system, for the headset to inform another Bluetooth device, like a cell phone to go "off-hook" and redirect voice signals thru the headset instead of using the microphone/speaker of the cell phone. The user can merely open the microphone arm to answer a call without touching the cell phone at all.

[006] So far Bluetooth has been seen as the best candidate personal or local area network technology to permit to delegate the control of a communication apparatus. A Bluetooth special interest group was formed to define and promote the Bluetooth technology. This group consists of employees of companies involved in Bluetooth who define together some of the technical requirements for Bluetooth products to ensure interoperability among products. Reference is made to one of the specification being drafted and reviewed by the Bluetooth SIG (Special Interest Group) Car Profile Working Group, "Hands-Free Profile", October 22, 2002 by Jesus A G. Pulido, herein incorporated by reference. This draft seeks to define the protocols and procedures that shall be used by devices implementing the usage model of operating a phone via an in-car device. This working group is interested in all implementations of the hands-free profile that enable a car's embedded hands-free unit to be wirelessly connected to a cellular phone for the purposes of acting as the cellular phone's audio input and output mechanism, providing full duplex audio with possibly noise suppression, voice recognition and so on.

[007] However other data communication technologies have been considered and may also enable to divert the control of performance of tasks from one device to another. For example, infra-red communication has also been contemplated. The international publication WO 02/19669 discloses a hands-free kit for a mobile radio –telephone handset comprising an earpiece and an infrared transmitter. The transmitter is arranged to relay audio signals from the handset to the earpiece signals from the transmitter. Thus, by positioning the transmitter

in line of sight of the earpiece receiver, audio signals may be relayed from the handset to the earpiece.

[008] It is an object of the invention to provide a different headset than the ones proposed by the prior art documents.

[009] It is an object of the invention to enhance the security of the user using a cellular communication device while doing something else.

[010] It is another object of the invention to ease the utilization of a portable cellular communication apparatus.

[011] It is yet an object of the invention to free the user from manipulating a communication apparatus when using it to transmit or receive data.

[012] To this end, a device of the invention comprises a wireless module, a control user interface and a headset. The wireless module is configured to receive a downlink wireless signal from a portable communication apparatus. The downlink wireless signal is representative of data received by the communication apparatus over another wireless network. The control user interface is coupled to the wireless module. The control user interface enables to transmit control commands to the communication apparatus via the wireless module in response to respective user input commands. The headset is mounted on the device and is operably coupled to the wireless module. The headset automatically renders an audio signal to the user when the headset is detached from the device. The audio signal is derived from the downlink wireless signal.

[013] A device of the invention permits to use and communicate data via the communication apparatus without manipulating the apparatus itself. The communication apparatus may be a cell-phone, a PDA, a navigation system, an MP3 player, a pager or or any device operating over a communications network such as wireless local area network, a cellular telephony network or a wireline communication network. The wireless capability of the device and apparatus permits to delegate and transfer the use and rendering of some functionalities of the communication apparatus to the device. For example, a voice conversation on a cell-phone is diverted away from the cell-phone and rendered via the headset of the device. To this end, an audio signal representative of the voice conversation is automatically rendered on the headset when the user detaches the headset from the device. As used herein, "detached" indicates that the headset, originally mounted on the device, is now unhooked from the device. However, although detached, the headset may still be connected to the device via a connector conveying the audio signal from the device to the headset. Alternately, the headset may be completely detached and disconnected from the device and in

such case, the headset comprises a wireless chip for communicating with the wireless module of the device. The wireless module redirects to the headset the downlink wireless Bluetooth signal received from the apparatus.

[014] The device of the invention permits for example, to pick up a phone call received on a wireless-enabled cell-phone (i.e. in addition to being enabled to communicate over a cellular phone network) by simply detaching the headset mounted on an ancillary device of the invention. The user may also pick up a call by activating a button of the control user interface and the voice conversation is thereafter rendered via the headset when it is detached from the device. When the headset is still mounted, i.e. attached, on the device, the voice conversation may be rendered via a loudspeaker of the device. The user does not need to actuate a button on the cell-phone itself and the user can make or receive calls using the device only. An advantage of the invention is to free the user from manipulating the apparatus when using it to receive or transmit data thereby freeing the user's hands and enhancing the user's security doing something else at the same time. An advantage of the invention is therefore to permit the user to have his hands free to perform other tasks. It must be noted that the device must be in a receiving range of the wireless-enabled apparatus to communicate with the apparatus using a short-range protocol for example. In an embodiment of the invention, the device and the apparatus are both Bluetooth-enabled and the forwarding of a communication received at the apparatus is forwarded to the device over a Bluetooth link.

[015] As used herein, the data as received by the apparatus over the wireless network encompasses any transfer of data. The data may convey audio data such as speech, music, artificial or natural voice or the data may also convey text data as will be explained hereinafter.

[016] The device may be implemented as a control medallion that can be used anywhere, e.g. when biking on the user's arm or the bike handle; when driving on the car steering wheel; when at work on the side of the computer monitor, etc… A further advantage of the invention is the great convenience the device brings to the user.

[017] The device may also be self-powered with a rechargeable battery that can be recharged either from a solar cell or from a cigarette lighter power source in a car.

[018] The invention is explained in further details, by way of examples, and with reference to the accompanying drawing wherein:

Fig.1 and Fig.2 show a device of the invention operating with a cell-phone; and,

Fig.3 is a flowchart illustrating a functioning of a device of the invention.

[019] Elements within the drawing having similar or corresponding features are identified by like reference numerals.

[020] Fig.1 shows a wireless communication system of the invention. The system comprises an apparatus 200 communicating over a wireless network 300 such as a GSM, CDMA, 3G, UMTS based cellular network or a WLAN network based on e.g. IEEE802.11, HomeRF, Hiperlan2 or the like. The apparatus 200 may communicate text, audio, data or a combination of the like over the wireless network 300. In the embodiment represented here, the apparatus 200 is a cell-phone communicating over a cellular network 300 however the invention is hereby not limited to this implementation and any other type of communication apparatus may also be contemplated, e.g. a pager, a personal digital assistant, a web-pad, a bi-directional remote control, a networked MP3 player, a navigation system or the like. Electronics and software pieces of the cell-phone 200 controlling communications over the cellular network 300 are not shown in Fig.1. The cell-phone 200 is Bluetooth enabled and in that respect comprises a Bluetooth chip 210 allowing the cell-phone 200 to communicate with another Bluetooth-enabled device located in its receiving range. The protocol for communications between an ancillary device and a Bluetooth cell-phone over a Bluetooth wireless network is described in the Bluetooth specification and in the October 2002 draft "Hands-free" of the Car Profile Working Group Bluetooth SIG.

[021] The system further comprises a device 100 of the invention. The device 100 is a control medallion reproducing some functions of the phone 200 as will be shown hereinafter. The medallion 100 is Bluetooth-enabled, as it comprises a Bluetooth module 120. The medallion 100 further comprises a microphone 140, a loudspeaker 180, a battery level indicator 150, a volume control 130, a call control button 160 and a detachable headset 110. The headset 110 is detachably mounted on the medallion 100.

[022] The Bluetooth module 120 enables the medallion 100 to communicate and transfer data with another identified and authorized Bluetooth device in its receiving range. When the cell-phone 200 is placed in the receiving range of the module 120, the module 120 and the chip 210 identify each other during a probe/quest exchange as defined in the Bluetooth standard. Once the module 120 and the chip 210 are mutually identified, the module 120 is configured to transmit control commands and data signals to the chip 210 and reciprocally the chip 210 may transmit data signals to the module 120.

[023] For example, the control button 160 may be coupled to the Bluetooth module 120 so when actuation of the button 160 by the user, the module transmits a control command associated with the actuation to the chip 120. Such control command may permit

control of the establishment of a new communication channel with the cell-phone 200 over the cellular network 300 and/or termination of an existing communication channel established with the cell-phone 200 over the cellular network 300. Thus, when the user is notified that a phone call is received or that a request is received for establishing a communication channel with the cell-phone 200 over the network 300, the user may press the button 160 to accept the call. The phone 200 may notify the user visually or audibly by causing text display, vibrating or ringing. Likewise at the end of a call the user may terminate the call by pressing the button 160 or another equivalent button. The module 120 transmits a termination control command to the chip 120 and in response to the received termination control command the chip 120 controls the cell-phone 200 to hang up.

[024] It is to be noted that these examplary embodiments of the invention are described herein in the framework of the Bluetooth protocol, however any wireless protocol may be used for the exchange of communications between the apparatus 200 and device 100 and any other wireless protocol is also encompassed such as IrDA, IEEE802.11, HomeRF, RendezVous, or other WLAN or WPAN (Wireless Personal Area Network) technologies.

[025] In the invention, the user may also pick up a call received on the cell-phone 200 by detaching the headset 110 as shown in Fig.2. The headset 110 comprises a headset holder 112 and an ear bud 114. The holder 112 is designed so that the user can easily place the headset 110 on his ear in a stable position. The ear bud 114 provides sound to the ear of the user. The design of the medallion 100 and the headset 110 as shown in Fig.1 and Fig.2 should not be considered as limiting the scope of the invention and alternative designs of the headset 110 are also within the scope of the invention. The headset 110 in normal position, i.e. when not is use, is mounted on the medallion 100 and rests on hooks 102 and 104. The headset 110 is detached when it is taken off the hooks 102 and 104 as shown in Fig.2. As used herein, "detached" indicates that the headset 110 is not mounted on the medallion 100 any longer however the headset 110 may still be connected to the medallion 100 via a cord 106. The cord 106 conveys an audio signal to the ear bud 114. In another embodiment, the headset 110 can be disconnected from the medallion 100 in the sense that no data or power connection exists between the headset 110 and the medallion 100 when the headset 110 is detached from the device 100. In this other embodiment, the cord 106 may be a retractable string that prevents the user from losing the headset 110. In this case, the headset 110 is further built in with a Bluetooth module 170 to communicate with the medallion 100 when detached from it. Audio signals may then be transmitted from the medallion 100 to the ear bud 114 over a Bluetooth link between the Bluetooth modules 120 and 170.

[026] Fig.3 is a flowchart 400 giving possible scenarios on how communications can be transferred from the cell-phone 200 to the medallion 100. When the phone rings in step 410, the user may accept an incoming call received by the cell-phone 200 over the network 300 using the medallion 100 by either detaching the headset 110 from the medallion 100 as explained above or by pressing the call acceptance button 160.

[027] If the user chooses the alternative of the headset 110 in step 420, the medallion 100 detects that the user has detached the headset 110 from the medallion 100. A mechanical system may detect the absence of the headset 110 on the hooks 102 and 104. Other detection systems for detecting the detachment of the headset 110 are also within the scope of the invention. Upon detection, the Bluetooth module 120 transmits a Bluetooth control signal to the chip 210 to automatically configure the cell-phone 200 to accept the incoming call in step 430. As a result in step 440, the live voice data 10 associated with the call received over the wireless network 300 is diverted away from the cell-phone 200 to the medallion 100 and in step 450 the live voice data 10 is further diverted from the medallion 100 to the headset 110. The live voice data 10 is diverted in the following manner. A Bluetooth signal 20 is first generated and transmitted by the chip 210 to the module 120. The signal 20 is a low power signal representative of the live voice data 10 received by the cell-phone 200. The Bluetooth signal 20 may be then further transmitted from the module 120 to the module 170 for play out on the ear bud 114. The user may adjust the volume of the headset 110 with the volume control 130.

[028] If the user accepts the call by pressing the button 160 in step 460, the module 470 configures the cell-phone 200 to accept the incoming call in step 470 as described in step 430. The live voice data 10 received over the wireless network 300 is then diverted in step 480 to the medallion 100 as described in step 440. In step 490, the medallion 100 is configured to render the live voice data 10 via a loudspeaker 180. The user may adjust the volume of the loudspeaker 180 with the volume control 130. It must be noted that the live voice data 10 is rendered via the loudspeaker 180 if the headset 110 is mounted on the medallion 100. If the headset 110 is then or was already detached from the medallion 100, the live voice data 10 is automatically forwarded from the medallion 100 to the headset 110 by the module 120.

[029] When the live voice data 10 is rendered using either the loudspeaker 180 or the headset 110, the microphone 140 on the medallion 100 captures the user's voice. The module 120 transmits the user's voice to the cell-phone for transmission over the network 300. In another embodiment, the microphone 140 is placed on the headset 110 and the user's

voice captured by the microphone 140 is transmitted from the headset 110 to the medallion 100 by the module 170 for further forwarding by the medallion 100 to the cell-phone 200.

[030] The battery level indicator 150 informs the user of a status of an internal battery of the medallion 100. The battery of the device 100 provides the necessary power to the Bluetooth module 120 for it to communicate with the cell-phone 200 or any other Bluetooth device located in the receiving range of the Bluetooth module 120. The battery may be replaced when empty or the battery is possibly rechargeable thru a solar cell or by connection to a cigarette lighter power via an adaptor.

[031] It must be appreciated that the automatic transfer of data other than voice data from the Bluetooth chip 210 to the Bluetooth module 120 when the headset 110 is detached is also encompassed in the invention. Indeed, the chip 210 may be configured to forward to the device 100 data representative of voice mails, songs, emails or the like. For example, when the cell-phone detects a new voice mail on the mailbox associated with the cell-phone 200, the cell-phone 200 audibly or visually notifies the user of the new voice mail. By detaching the headset 110 as mentioned above, the module 120 may configure the cell-phone 200 to automatically connect to the mailbox over the network 300 and retrieve the voice mail. The voice mail may then be forwarded to the headset 110 in the way mentioned above.

[032] In yet another embodiment of the invention, the apparatus 200 may be a laptop with wireless connection to the network 300, e.g. a wireless modem. The module 120 may be configured to control the Bluetooth chip 210 to forward any data signal received by the apparatus 200 over the wireless network 300 when the headset 110 is detached from the medallion 100. For example, when the apparatus 200 receives a new email over the network 300, the chip 210 automatically forwards data representative of the email to the module 120 for rendering by the headset 110. The apparatus 200 may comprises a Text-to-Speech application that generates an audio file from the email and this audio file is forwarded by the chip 210 to the module 120 for further forwarding the module 170. In the invention, emails received by the apparatus 200 can then be automatically "read" to the user who had previously detached the headset 110 from the medallion 100. In anther embodiment, the user may have his emails played out loud by the speaker 180 when the headset 110 is mounted on the medallion 100. When the apparatus 200 notifies the user that a new email has been received, the user can press the button 160 to have an audio file representative of the email or the addresser played out on the loudspeaker 180.

CLAIMS

1. A device comprising:

a wireless module configured to receive a downlink wireless signal from a portable wireless-enabled communication apparatus over a first network, the downlink wireless signal being representative of data received by the portable communication apparatus over a second wireless network;

a control user interface, coupled to the wireless module, enabling to transmit control commands to the portable communication apparatus via the wireless module in response to respective user input commands; and,

a headset, detachably mounted on the device and operably coupled to the wireless module, for automatically rendering an audio signal to the user based on the downlink wireless signal when the headset is detached from the device.

2. The device of Claim 1, further comprising:

a connector connecting the headset to the device and conveying the audio signal to the headset.

3. The device of Claim 2, wherein the connector is retractable.

4. The device of Claim 1, wherein the headset comprises a Bluetooth chip and the wireless module is configured to automatically wirelessly forward the downlink wireless signal to the Bluetooth chip when the headset is physically disconnected from the device.

5. The device of Claim 1, further comprising:

a speakerphone for audibly rendering the audio signal to the user upon command by the user when the headset is mounted on the device.

6. The device of Claim 1, further comprising:

a microphone for converting a voice signal from the user into a low frequency voice signal; and

wherein the wireless module is further configured to transmit to the portable communication apparatus an uplink wireless signal based on the low frequency voice signal.

7. The device of Claim 1, wherein the control user interface comprises a volume control enabling the user to adjust a volume of the headset to a desired level.

8. The device of Claim 1, wherein the control user interface comprises a call control, which upon selection enables to configure the communication apparatus to accept a data communication initiated with the portable communication apparatus over the second wireless network.

9. The device of Claim 8, wherein the initiated data communication comprises a phone call.

10. The device of Claim 8, wherein the initiated data communication comprises a transfer of an email.

11. The device of Claim 1, wherein the control user interface comprises call control, which upon selection enables to configure the portable communication apparatus to interrupt a data communication initiated with the portable communication apparatus over the second wireless network.

12. The device of Claim 1, further comprising:
a rechargeable battery acting as a power source to the wireless module.

13. The device of Claim 12, wherein the battery comprises a light sensor for recharging the battery.

14. The device of Claim 12, wherein the battery is rechargeable from a car cigarette lighter power source.

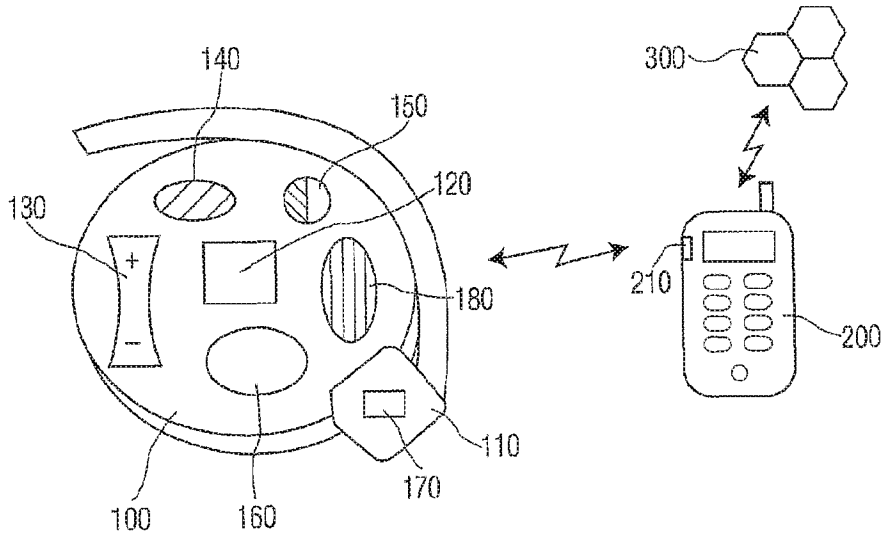
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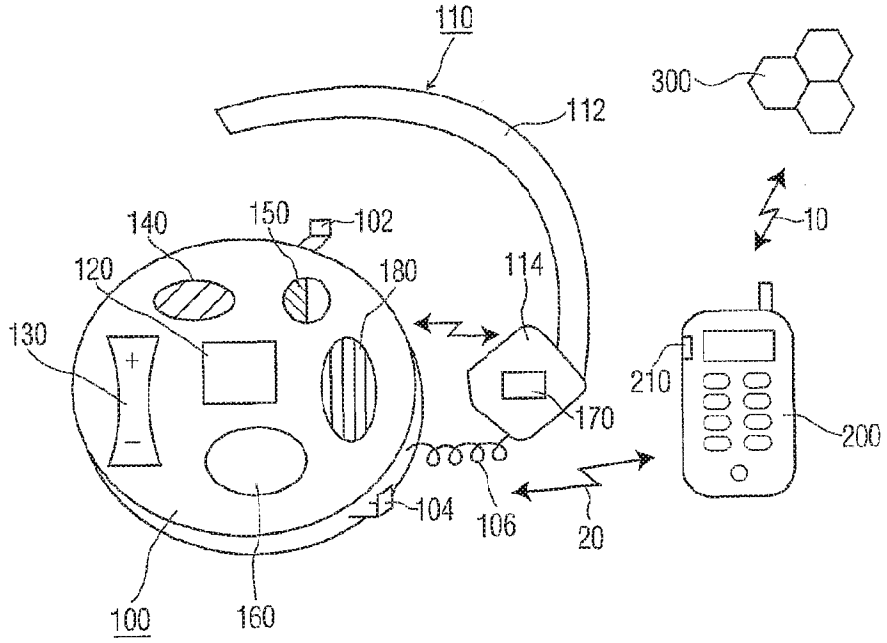
FIG. 1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100
160

FIG. 2

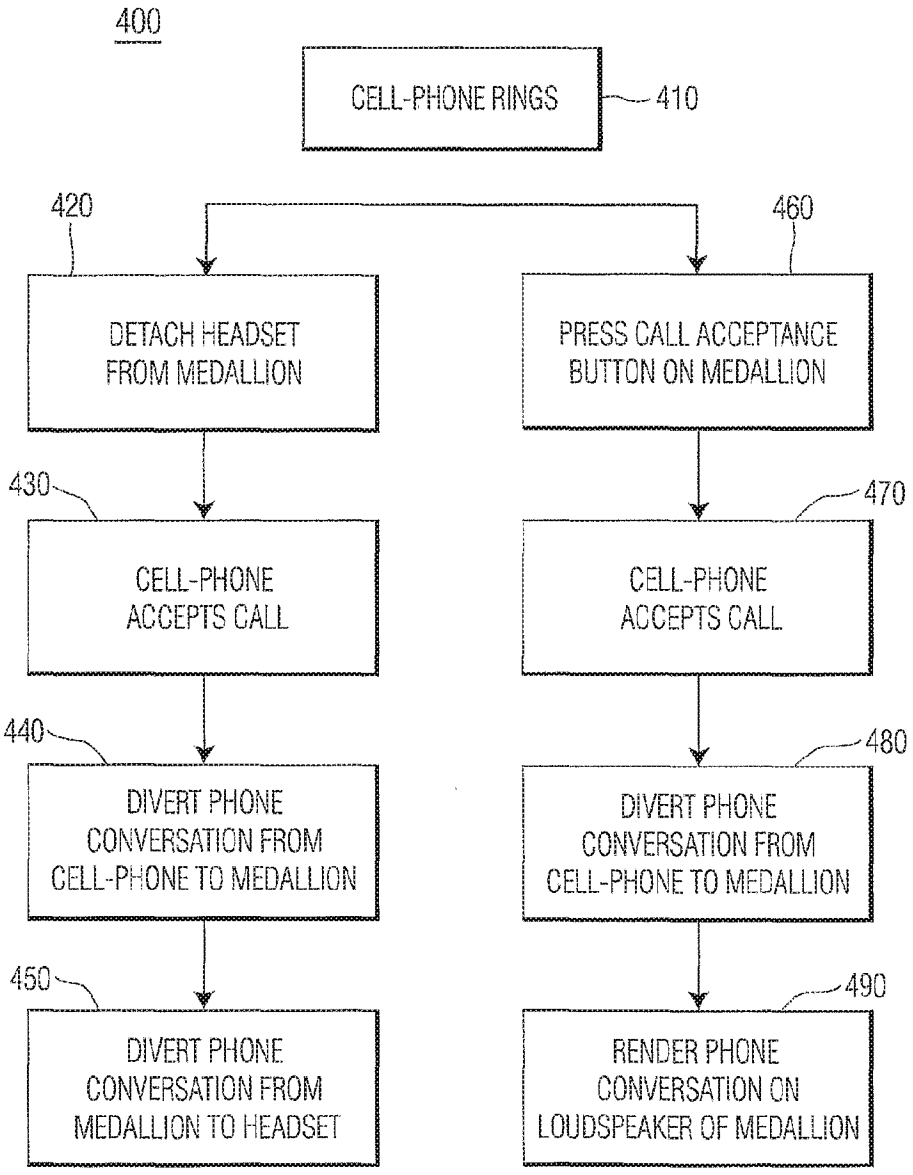
400
CELL-PHONE RINGS
410
420
460
DETACH HEADSET FROM MEDALLION
PRESS CALL ACCEPTANCE BUTTON ON MEDALLION
430
470
CELL-PHONE ACCEPTS CALL
CELL-PHONE ACCEPTS CALL
440
480
DIVERT PHONE CONVERSATION FROM CELL-PHONE TO MEDALLION
DIVERT PHONE CONVERSATION FROM CELL-PHONE TO MEDALLION
450
490
DIVERT PHONE CONVERSATION FROM MEDALLION TO HEADSET
RENDER PHONE CONVERSATION ON LOUDSPEAKER OF MEDALLION

FIG. 3

INTERNATIONAL SEARCH REPORT

Internat[illegible] pplication No
PCT/IB 03/01953

A. CLASSIFICATION OF SUBJECT MATTER
IPC 7 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)
IPC 7 H04M H04B

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 practical, search terms used)
EPO-Internal, PAJ

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category °	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
Y	EP 0 840 465 A (NOKIA MOBILE PHONES LTD) 6 May 1998 (1998-05-06) column 4, line 25 -column 6, line 41; figure 1A column 13, line 27 -column 15, line 46; figures 3,4	1,6-12
Y	US 5 881 149 A (WEATHERILL NEIL K) 9 March 1999 (1999-03-09) column 2, line 66 -column 3, line 67 column 4, line 55 -column 7, line 58; figures 1-19	1,6-12

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[X] Further documents are listed in the continuation of box C.

[X] Patent family members are listed in 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 document 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.

"&" document member of the same patent family

Date of the actual completion of the international search	Date of mailing of the international search report
12 August 2003	20/08/2003

Name and mailing address of the ISA	Authorized officer
European Patent Office, P.B. 5818 Patentlaan 2 NL – 2280 HV Rijswijk Tel. (+31–70) 340–2040, Tx. 31 651 epo nl, Fax: (+31–70) 340–3016	Delangue, P

Form PCT/ISA/210 (second sheet) (July 1992)

C.(Continuation) DOCUMENTS CONSIDERED TO BE RELEVANT

Category °	Citation of document, with indication,where appropriate, of the relevant passages	Relevant to claim No.
A	WO 01 99393 A (SEIKO EPSON CORP (JP)) 27 December 2001 (2001-12-27)	1,4,6, 8-11
A,P	& EP 1 213 896 A (SEIKO EPSON CORP.) 12 June 2002 (2002-06-12) column 15, line 40 -column 17, line 51; figures 7-9	1,4,6, 8-11
A	US 6 230 029 B1 (HÄHN ET AL) 8 May 2001 (2001-05-08) column 4, line 15 -column 8, line 7; figures 1-10	1,2,6,7, 12,14
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INTERNATIONAL SEARCH REPORT

Internat[illegible] application No
PCT/IB 03/01953

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		EP 0840465 A2	06-05-1998
		JP 10163917 A	19-06-1998
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US 6230029 B1	08-05-2001	NONE	
JP 11177666 A	02-07-1999	NONE	

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WO 2008/033491 A2

(54) Title: AUDIO DATA STREAMING WITH AUTO SWITCHING BETWEEN WIRELESS HEADSET AND SPEAKERS

(57) Abstract: Systems and methods for a speaker system are disclosed. The speaker system generally includes an audio amplifier, a loudspeaker, a wireless communications module, and an electronic switch. The electronic switch receives an audio signal from an audio source and routes the audio signal to the audio amplifier or the wireless communications module. The electronic switch routes the audio signal to the wireless communications module upon formation of a wireless link by the wireless communications module.

AUDIO DATA STREAMING WITH AUTO SWITCHING BETWEEN WIRELESS HEADSET AND SPEAKERS

BACKGROUND OF THE INVENTION

[0001] Audio devices often allow a user to listen to an output audio signal such as music through a loudspeaker or through headphones. For example, a user may listen to music from a personal computer (PC) or other electronic device through externally powered loudspeakers, which are connected to the PC or electronic device and receive and output the audio signal. Alternatively, a user may wish to listen to the audio signal (also referred to herein as an audio stream) from the PC or electronic device using headphones or a communications headset. In the prior art, users must manually switch the audio signal between the speakers and the headset or vice versa. Manually switching the audio signal may be inconvenient or troublesome for the user.

[0002] As a result, there is a need for improved methods and apparatuses for switching between speakers and headsets.

BRIEF DESCRIPTION OF THE DRAWINGS

[0003] The present invention will be readily understood by the following detailed description in conjunction with the accompanying drawings, wherein like reference numerals designate like structural elements.

[0004] **FIG. 1** illustrates a simplified block diagram view of a speaker system in one example of the invention.

[0005] **FIG. 2** illustrates a simplified block diagram of a wireless headset for use in one example of the invention.

[0006] **FIGS. 3A** and **3B** are a flow chart illustrating operation of the speaker system in one example of the invention in which a wireless headset is undocked.

[0007] **FIG. 4** is a flow chart illustrating operation of the speaker system in one example of the invention in which a wireless headset is docked.

[0008] **FIG. 5** illustrates a simplified block diagram view of a speaker system in a further example of the invention.

[0009] **FIGS. 6A** and **6B** are a flow chart illustrating operation of the speaker system shown in **FIG. 5** in which a wireless headset is undocked.

[0010] **FIG. 7** is a flow chart illustrating operation of the speaker system shown in **FIG. 5** in which a wireless headset is docked.

[0011] **FIG. 8** illustrates a simplified block diagram view of a speaker system in a further example of the invention.

DESCRIPTION OF SPECIFIC EMBODIMENTS

[0012] Methods and apparatuses for speaker systems and wireless headsets are disclosed. The following description is presented to enable any person skilled in the art to make and use the invention. Descriptions of specific embodiments and applications are provided only as examples and various modifications will be readily apparent to those skilled in the art. The general principles defined herein may be applied to other embodiments and applications without departing from the spirit and scope of the invention. Thus, the present invention is to be accorded the widest scope encompassing numerous alternatives, modifications and equivalents consistent with the principles and features disclosed herein. For purpose of clarity, details relating to technical material that

is known in the technical fields related to the invention have not been described in detail so as not to unnecessarily obscure the present invention.

[0013] Generally, this description describes a method and apparatus for a speaker system for outputting an audio stream which provides automated redirection of the audio stream from the speaker system loudspeaker or loudspeakers (also referred to herein as "speakers") to a wireless headset and vice versa. The act of switching on or off the headset redirects the audio stream such that further manual intervention is not required.

[0014] In one example of the invention, a Bluetooth module with a redirect switch is embedded in a self powered speaker system. The Bluetooth module when not linked to a wireless Bluetooth headset passes the audio stream to the speaker system loudspeakers.

[0015] When the wireless Bluetooth headset is switched on and a Bluetooth wireless link is activated, the Bluetooth module in the speaker system automatically routes the audio stream to the wireless Bluetooth headset and mutes the loudspeakers. Similarly, when the headset Bluetooth link is terminated, the speaker system automatically routes the audio stream to the loudspeakers at the powered speaker system.

[0016] The present invention is applicable to a variety of different types of wireless listening devices in addition to mobile communication headsets, including stereo listening headsets (also referred to has headphones). While the present invention is not necessarily limited to such devices, various aspects of the invention may be appreciated through a discussion of various examples using this context.

[0017] In one example of the invention, a speaker system includes an audio amplifier, a loudspeaker, a wireless communications module, and an electronic switch. The electronic switch receives an audio signal from an audio source and routes the audio signal to the audio amplifier or the wireless communications module. The switch routes

the audio signal to the wireless communications module upon formation of a wireless link by the wireless communications module.

[0018] In a further example of the invention, an audio system includes an audio source device and a loudspeaker system. The audio source device includes a first wireless communications module. The loudspeaker system includes an audio amplifier, a loudspeaker for receiving an amplified audio signal from the audio amplifier, and a second wireless communications module. The second wireless communications module receives an audio signal from the first wireless communications module over a first wireless link. The second wireless communication module includes a switch for routing the audio signal to the loudspeaker system audio amplifier or transmitting the audio signal over a second wireless link to a wireless headset upon activation of the wireless headset.

[0019] In an example of the invention, a method for automatically routing an audio signal is presented. The method includes providing a speaker system having a loudspeaker, a first wireless communications module, and an electronic switch. A wireless headset includes a second wireless communications module and a headset speaker. The method includes receiving an audio signal at the speaker system from an audio source device and automatically setting the electronic switch to a first position to route the audio signal to the loudspeaker or to a second position to route the audio signal to the first wireless communications module. The electronic switch is set to the second position upon activation of the wireless headset and formation of a wireless link between the first wireless communications module and the second wireless communications module. The electronic switch is set to the first position upon deactivation of the wireless headset and termination of the wireless link.

[0020] In an example of the invention, a further method for automatically routing an audio signal is presented. The method includes providing a speaker system including a loudspeaker, a first wireless communications module, and an electronic switch. A wireless headset includes a second wireless communications module and a headset speaker. The method includes receiving an audio signal at the speaker system from an audio source device, setting the electronic switch to route the audio signal to the loudspeaker. The method further includes activating the wireless headset and establishing a wireless link between the first wireless communications module and the second wireless communications module. The method further includes responsively setting the electronic switch to route the audio signal to the first wireless communications module and transmitting the audio signal from the first wireless communications module to the second wireless communications module over the wireless link. The audio signal is output at the headset speaker.

[0021] In a further example of the invention, an audio system includes an audio source device, a loudspeaker system, and a wireless headset. The audio source device includes a first wireless communications module and a switch for routing an audio signal. The loudspeaker system includes an audio amplifier, a loudspeaker for receiving an amplified audio signal from the audio amplifier, and a second wireless communications module for receiving the audio signal from the first wireless communications module over a first wireless link. The wireless headset includes a headset speaker and a third wireless communications module for receiving the audio signal from the first wireless communications module over a second wireless link. The switch routes the audio signal to the wireless headset upon activation of the wireless headset and the switch routes the audio signal to the loudspeaker system upon deactivation of the wireless headset.

[0022] **FIG. 1** illustrates a simplified block diagram view of a speaker system 2 in one example of the invention. An audio source device 18 provides audio to speaker system 2. For example, audio source device 18 may be a computer system including a CPU, storage, memory, and a host interface for outputting digital audio to speaker system 2. For example, audio source device 18 may be coupled via a mini-phone stereo 3.5 mm connector or USB cable to speaker system 2.

[0023] The speaker system 2 receives audio signals at a connection interface 17, which provides the audio signals to a switch 4 controlled by controller 6. In one state of operation, controller 6 operates switch 4 to provide the audio signals along line 9 to amplifier 8. Controller 6 operates switch 4 using a switch control signal along line 11. Amplifier 8 drives loudspeaker 14. Although only a single amplifier 8 and loudspeaker 14 are illustrated in **FIG. 1**, speaker system 2 may include additional amplifiers or loudspeakers for multiple channels of audio signals. In such an example, a decoder is utilized to identify the audio signal channel for each amplifier and loudspeaker. Amplifier 8 may include a pre-amplifier stage circuit 10 and a power amplifier stage circuit 12 using an operational amplifier designed for high quality audio performance. Controller 6 may further provide an amplifier control signal to amplifier 8. Controller 6 may for example be an integrated circuit. Power supply 15 supplies power to the amplifier 8 and other components of speaker system 2, and may be turned on by a power on/off switch 19. In one example, speaker system 2 is self powered by a power supply 15 driven by a conventional 120V AC wall electrical outlet to provide DC power to the components of speaker system 2. In a further example, power supply 15 is a battery or other power source.

[0024] In a second state of operation, controller 6 operates switch 4 to provide the audio signals to a Bluetooth module 7 for wireless transmission from speaker system 2 to a proximate wireless headset 16 having Bluetooth functionality. The term "module" is used interchangeably with "circuitry" herein. For example, Bluetooth module 7 may be a chip module. Wireless headset 16 includes internal components which are described below in reference to **FIG. 2**. The controller 6 operation of switch 4 is triggered to route audio signals to Bluetooth module 7 along line 13 when controller 6 receives a control signal from Bluetooth module 7 that Bluetooth link 20 between wireless headset 16 and Bluetooth module 7 has been established. In one example of the invention, as described in further detail below in reference to **FIG. 3**, wireless headset 16 is activated and establishes Bluetooth link 20 with Bluetooth module 7 upon undocking of wireless headset 16 from headset docking station 21. Although illustrated separately, controller 6 and Bluetooth module 7 may be integrated onto a single chip module.

[0025] In one example of the invention, switch 4 is a software controlled switch. For example, switch 4 is a field effect transistor (FET). Additional examples of switch 4 include, without limitation, relays or microelectromechanical (MEMS) switches. When the headset 16 is docked with headset dock 21, the software executed by controller 6 activates the FET via a programmed input/output (PIO) on the controller 6. In an example where the controller is integrated with a Bluetooth module chip, the PIO is on the Bluetooth module chip. When the FET is activated, the audio stream is passed to amplifier 8 for output to loudspeaker 14. When the headset 16 is undocked i.e. in use, the software executed by controller 6 deactivates the FET by changing the state of the PIO, switching off the audio to the loudspeaker 14 and via the software transfers the audio stream to the Bluetooth module 7 for transmission over Bluetooth link 20. Controller 6

may receive a user input such as a switch to output the audio signal simultaneously at both loudspeaker 14 and headset 16.

[0026] The Bluetooth specification, version 2.0, is hereby incorporated by reference. A prescribed interface such as Host Control Interface (HCI) is defined between each Bluetooth module. Message packets associated with the HCI are communicated between the Bluetooth modules. Control commands, result information of the control commands, user data information, and other information are also communicated between Bluetooth modules.

[0027] In the examples described herein, speaker system 2 and wireless headset 16 communicate over a Bluetooth personal area network (PAN) via the wireless link established by the Bluetooth module 7 and a corresponding Bluetooth module at the wireless headset 16. In further examples of the invention, the PAN may use a variety of radio-frequency networks. For example, the radio-frequency network could employ 802.11, or DECT standards based communication protocols in place of Bluetooth.

[0028] **FIG. 2** illustrates a simplified block diagram of a wireless headset 16 for use in one example of the invention. Referring to **FIG. 2**, components of a wireless headset 16 include a Bluetooth module 24, a headset controller 22, an audio processor 26, a dock/undock switch 28, one or more speakers 32, a microphone 34 and a user input 30. A battery 23 provides power to the wireless headset components. In a further example of the invention, the wireless headset may not have a microphone.

[0029] Headset controller 22 controls the overall operation of the wireless headset, and comprises a processor, memory and software to implement functionality as described herein. The headset controller 22 receives input from headset user input 30. Where the audio data is a stereo signal, audio processor 26 includes a stereo decoder and each audio

channel is output to a different speaker 32. The headset controller 22 further interacts with Bluetooth module 24 to transmit and receive signals between the wireless headset 16 and speaker system 2. Bluetooth module 24 also includes an antenna. In a further example, the Bluetooth module 24 may include a controller which controls one or more operations of the wireless headset 16. Although the use of a Bluetooth module 24 is described in the present example, wireless headset 16 may use a wireless communication module implementing a variety of wireless communication technologies to correspond with the wireless communication technology employed by the speaker system. For example, wireless communication modules operating on the IEEE 802.11 or DECT standard may be used.

[0030] The Bluetooth module 24 enables the wireless headset to communicate with other Bluetooth devices according to the Bluetooth protocol. The Bluetooth modules transmit and receive a control command, a response thereto and user data by exchanging message packets through a host control interface (HCI) defined between the Bluetooth modules. An RS232 interface, a USB interface, or a standard PC interface can, for example, be utilized to actually transmit an HCI packet. The HCI packet is classified into a command packet, an event packet and a data packet. The command packet provides about 60 command words for various utilizations of the Bluetooth module. Under the control of the controller 22, the audio processor 26 demodulates an audio signal received from the Bluetooth module 24 into an audio signal and provides the demodulated audio signal to the speaker 32.

[0031] The user input 30 provides data or selections inputted by the user to the controller 22. The user input 30 may include a multifunction power, volume, mute, and select button or buttons. Other user interfaces may be included on the headset, such as a

link active/end interface. It will be appreciated that numerous other configurations exist for the user interface, as the particular button or buttons and their locations are not critical to the present invention. The main housing of the headset may be in the shape of a loop to be worn behind a user's ear, may use a headband, or have another shape or wearing means. Controller 22 receives information from dock/undock switch 28 whether the headset is docked or undocked from a headset docking station and may responsively power on/off the headset upon docking or undocking.

[0032] **FIGS. 3A** and **3B** are a flow chart illustrating operation of the speaker system in one example of the invention in which a user undocks a wireless headset. At start block 200, a headset is docked at a headset docking station. At block 202, the speaker system receives an audio signal from an audio source device. At block 204, a controller sets a switch so that the audio signal is routed to an amplifier at the speaker system. At block 206, the amplifier outputs an amplified audio signal to the speaker system loudspeakers. At block 207, the wireless headset is activated and polls for possible speaker systems. Activation and polling are performed in a manner similar to the Bluetooth Device Discovery Procedure as described in the Bluetooth Specification.

[0033] At block 208, the speaker system receives a link connection request from the wireless headset to establish a Bluetooth link. At block 210, the speaker system Bluetooth module establishes a wireless Bluetooth link with a wireless headset Bluetooth module. In one example, the Bluetooth link is automatically established when the wireless headset is undocked from the headset docking station. In a further example, the Bluetooth link is established when a user manually activates the wireless headset using a headset user interface.

[0034] Upon formation of the Bluetooth link, at block 212 the speaker system controller operates the switch to terminate transfer of the audio signal to the amplifier. At block 214, the controller initiates transmission of the audio signal over the Bluetooth link from the speaker system Bluetooth module to the wireless headset Bluetooth module. At block 216, the wireless headset Bluetooth module receives the audio signal over the wireless link. At block 218, the wireless headset processes the audio signal. At block 220, the audio signal is output to the user via the wireless headset speaker or speakers.

[0035] Formation of the Bluetooth link between the wireless headset and the speaker system upon a link connection request by a wireless headset will now be described. The headset controller determines whether the headset has been undocked or the user has activated the headset manually via a headset user interface. Upon this determination, the headset controller determines whether a speaker system Bluetooth module with which the wireless headset is registered is located within the coverage area where a Bluetooth link may be formed. If yes, the headset controller transmits a link connection request message to the powered stereo system Bluetooth module. If a link connection response message is received from the speaker system, the Bluetooth wireless link is formed between the wireless headset and the speaker system.

[0036] **FIG. 4** is a flow chart illustrating operation of the speaker system in one example of the invention in which a user docks a wireless headset. At start block 300, a headset is receiving audio over the Bluetooth link with a speaker system. At block 302, a user docks the headset at a headset docking station. Alternatively, the user may manually turn off the headset. At block 304, the Bluetooth link between the headset and the speaker system is terminated. At block 306, the speaker system controller terminates transfer of audio to the speaker system Bluetooth module. At block 308, the speaker

system controller sets a switch so that the audio signal is routed to an amplifier at the speaker system. At block 310, the amplifier outputs an amplified audio signal to the speaker system loudspeakers.

[0037] **FIG. 5** illustrates a simplified block diagram view of a speaker system in a further example of the invention. An audio source device 54 provides audio to speaker system 42. For example, audio source device 54 may be a computer system including a CPU, storage, memory, and a host interface for outputting digital audio to speaker system 42. Audio source device 54 includes a Bluetooth module 56 for outputting digital audio to speaker system 42 over a Bluetooth link 58.

[0038] The speaker system 42 receives the audio signals over Bluetooth link 58 at a Bluetooth module 44. Bluetooth module 44 provides the audio signals to a switch 48 operated by controller 46. In one state of operation, controller 46 operates switch 48 to provide the audio signals along line 49 to amplifier 50. In one example of the invention, switch 48 is a software controlled switch. For example, switch 48 may be a field effect transistor that is turned on or off as desired to route the audio signal. Additional examples of switch 48 include, without limitation, relays or microelectromechanical (MEMS) switches. In additional examples, other types of switches capable of performing the same function may be used. Amplifier 50 drives one or more loudspeakers 52. Although only a single amplifier and loudspeaker 52 is illustrated, speaker system 42 may include additional amplifiers and corresponding loudspeakers for multiple channels of audio signals. In such an example, a decoder is utilized to identify the audio signal channel for each amplifier and loudspeaker. Amplifier 50 may include a pre-amplifier stage circuit and a power amplifier stage circuit using an operational amplifier designed for high quality audio performance. Controller 46 may, for example, be an integrated

circuit. Power supply 66 supplies power to the amplifier 50 and other components of speaker system 42, and may be turned on by a power on/off switch. In one example, speaker system 42 is a self-powered and power supply 66 is driven by a conventional 120V AC wall electrical outlet to provide DC power to the components of speaker system 42. In a further example, power supply 15 is a battery, allowing speaker system 42 to be a wireless device.

[0039] In a second state of operation, controller 46 operates switch 48 within Bluetooth module 44 to transmit the audio signals over a Bluetooth link 60 from speaker system 42 to a wireless headset 62. In one example, the Bluetooth module 44 receives digital audio signals and retransmits the digital audio signals over Bluetooth link 60. In a further example, Bluetooth module 44 receives digital audio signals, converts the signal to an analog signal, and then reconverts the signal to a digital signal for transmission over Bluetooth link 60. The controller 46 operation of switch 48 is triggered to route audio signals over Bluetooth link 60 when controller 46 receives a control signal that Bluetooth link 60 between wireless headset 62 and Bluetooth module 44 has been established. In one example of the invention, as described in further detail below in reference to **FIG. 6**, wireless headset 62 establishes Bluetooth link 60 with Bluetooth module 44 upon undocking of wireless headset 62 from a headset docking station 64. Controller 46 may receive a user input such as a switch to output the audio signal simultaneously from both loudspeaker 52 and headset 62.

[0040] In the example shown in **FIG. 5**, wireless speaker system 42 may be flexibly placed without the need for connecting wires. Speaker system 42 may be battery powered, further increasing placement flexibility. The further use of a wireless headset 62 provides additional listening flexibility.

[0041] **FIGS. 6A** and **6B** are a flow chart illustrating operation of the speaker system shown in **FIG. 5** in which a wireless headset is undocked. At start block 400, a headset is docked at a headset docking station. At block 402, a speaker system Bluetooth module receives an audio signal from an audio source device over a Bluetooth link. At block 404, a controller sets a switch so that the audio signal is routed to an amplifier at the speaker system. At block 406, the amplifier outputs an amplified audio signal to the speaker system loudspeakers. At block 408, the speaker system receives a link connection request from the wireless headset. At block 410, a speaker system Bluetooth module establishes a wireless Bluetooth link with a wireless headset Bluetooth module. In one example, the Bluetooth link is established when the wireless headset is undocked from the headset docking station. In a further example, the Bluetooth link is established when a user manually activates the wireless headset using a headset user interface.

[0042] Upon formation of the Bluetooth link, at block 412 the speaker system controller operates the switch to terminate transfer of the audio signal to the amplifier. In one example of the invention, the controller is located within the Bluetooth module at the speaker system. At block 414, the controller initiates transmission of the audio signal over the Bluetooth link from the speaker system Bluetooth module to the wireless headset Bluetooth module. At block 416, the wireless headset Bluetooth module receives the audio signal over the wireless link. At block 418, the wireless headset processes the audio signal. At block 420, the audio signal is output to the user via the wireless headset speaker or speakers. Formation of the Bluetooth link between the wireless headset and the speaker system upon a request by a wireless headset is as described above. In this manner, the user does not need to manually switch the audio from the speaker system to the wireless headset as switching is performed automatically at the speaker system.

[0043] **FIG. 7** is a flow chart illustrating operation of the speaker system shown in **FIG. 5** in which a wireless headset is docked by a user. At start block 500, a wireless headset is receiving audio over the Bluetooth link with a speaker system. At block 502, a user docks the headset at a headset docking system. Alternatively, the user may manually turn off the headset. At block 504, the Bluetooth link between the headset and the speaker system is terminated. At block 506, the speaker system Bluetooth module stops routing of the audio signal over the Bluetooth link to the headset. At block 508, the speaker system Bluetooth module sets a switch so that the audio signal is routed to an amplifier at the speaker system. At block 510, the amplifier outputs an amplified audio signal to the speaker system loudspeakers.

[0044] **FIG. 8** illustrates a simplified block diagram view of a speaker system in a further example of the invention. An audio source device 84 provides audio to powered speaker system 72. For example, audio source device 84 may be a computer system including a CPU, storage, memory, and a host interface for outputting digital audio to powered speaker system 72. Audio source device 84 includes a Bluetooth module 86 for outputting digital audio to speaker system 72 over a Bluetooth link 88. Software at audio source device 84 selectively routes audio to either powered speaker system 72 (over Bluetooth link 88) or a headset 92 (over Bluetooth link 90).

[0045] The powered speaker system 72 receives the audio signals over Bluetooth link 88 at a Bluetooth module 74. Bluetooth module 74 provides the audio signals to a line 79 to amplifier 80. Amplifier 80 drives one or more loudspeakers 82. Although only a single amplifier and loudspeaker 82 is illustrated, powered speaker system 72 may include additional amplifiers and corresponding loudspeakers for multiple channels of audio signals. A decoder is utilized to identify the audio signal channel for each

amplifier and loudspeaker. A power supply 96 supplies power to the amplifier 80 and other components of powered speaker system 72. In one example, power supply 96 is driven by a conventional 120V AC wall electrical outlet to provide DC power to the components of powered speaker system 72. In a further example, powered speaker system 72 receives power from a battery or other power source.

[0046] In a second state of operation, a controller 87 at audio source device 84 executes code to transmit the audio signals over a Bluetooth link 90 from audio source device 84 to a Bluetooth module 91 at wireless headset 92. The controller 87 routes audio signals over Bluetooth link 90 when controller 87 receives a control signal that Bluetooth link 90 between wireless headset 92 and Bluetooth module 86 has been established. In one example of the invention, wireless headset 92 establishes Bluetooth link 90 with Bluetooth module 86 upon undocking of wireless headset 92 from a headset docking station 94. Alternatively, Bluetooth link 90 may be established upon depression of an activation button on headset 92. In this manner, headset 92 is treated as the priority device by audio source device 84 whenever headset 92 is activated.

[0047] **FIG. 9** illustrates a simplified block diagram view of a speaker system 102 in a further example of the invention. Speaker system 102 has the same functionality as speaker system 2 described above in reference to **FIG. 1** and **FIG. 3**, with the added functionality of a mute switch upon receipt of a mute command from a headset 116. An audio source device 118 provides audio to speaker system 102. For example, audio source device 118 may be a computer system including a CPU, storage, memory, and a host interface for outputting digital audio to speaker system 102.

[0048] An audio source device 150 is configured to operate with a headset 116. For example, audio source device 150 may be a cellular phone, digital music player, or other

electronic device. When audio source device 150 is active, wireless headset 116 is activated and establishes Bluetooth link 154 with a Bluetooth module at audio source device 150 upon undocking of wireless headset 116 from headset docking station 121. Bluetooth link 120 is also established with speaker system 102. For example, when audio source device 150 is active, wireless headset 116 considers audio source device 150 as the primary device when wireless headset 116 is activated. Upon activation, wireless headset 116 automatically sends a mute command to speaker system 102 over Bluetooth link 120. For example, the command may be either a proprietary command (over a serial profile for example) or using a secondary standard profile (such as the remote control profile) to send a mute command generated automatically when wireless headset 116 connects to audio source device 150. The command may be implemented with standard Bluetooth commands along with custom firmware in wireless headset 116. If speaker system 102 is currently outputting music at loudspeaker 114, controller 106 mutes the audio output using mute switch 152. In this manner, audio output by speaker system 102 is automatically muted upon activation of wireless headset 116. Multiple Bluetooth "profiles" can be set-up for each link between the wireless headset 116 and other devices. These profiles use the same radio link but define different data protocols. Multiple profiles can be active simultaneously over the same radio link between two devices. Proprietary profiles are also possible.

[0049] In the examples described herein, speaker system 102, wireless headset 116, and audio source device 150 communicate over a Bluetooth personal area network (PAN) via the Bluetooth links 120, 154. In further examples of the invention, the PAN may use a variety of radio-frequency networks. For example, the radio-frequency network could

employ 802.11, or DECT standards based communication protocols in place of Bluetooth. Custom protocols and profiles may be used.

[0050] In a further example, speaker system 102 has four operational states. In the first state, headset 116 is inactive and loudspeaker 114 is on. In the second state, headset 116 is active and receiving streamed audio from speaker system 102, and loudspeaker 114 is off. In a third operational state, headset 116 is active and receiving audio from audio source device 150, while loudspeaker 114 is off (e.g., through muting). In a fourth operational state, wireless headset 116 is active and receiving and outputting streamed audio from speaker system 102, and loudspeaker 114 is on. Whether loudspeaker 114 is on providing dual output along with wireless headset 116 may be controlled by a user interface located at speaker system 102.

[0051] Furthermore, there may be a mute toggle button on the speaker system 102 to override the default behavior in case the radio link fails and the wireless headset 116 can't restore proper operation. For operational state one, the audio stream would be suspended and no mute would be have been generated so the speaker system 102 would be on. For operational state two there would be an active audio stream between the speaker system 102 and the wireless headset 116 so the speaker system 102 would be off (possibly overridden by toggling the speaker system 102 mute button to create operational state four). For operational state three, the wireless headset 116 suspends the stream from the speaker system 102 (normal behavior) and issue a mute command via a separate profile (new). The suspend is normal, the automatic mute (and the corresponding un-mute at the termination of an active link to another device) may be custom programmed but may also use a standard profile for command transmission.

[0052] The various examples described above are provided by way of illustration only and should not be construed to limit the invention. Based on the above discussion and illustrations, those skilled in the art will readily recognize that various modifications and changes may be made to the present invention without strictly following the exemplary embodiments and applications illustrated and described herein. Such changes may include, but are not necessarily limited to: power source of the speaker system, type of wireless headset, wireless communication technologies or protocols used to form the wireless links described herein, whether controller circuitry performing functions described herein is integrated with or separate from Bluetooth modules, and type of audio source device. Such modifications and changes do not depart from the true spirit and scope of the present invention that is set forth in the following claims.

[0053] While the exemplary embodiments of the present invention are described and illustrated herein, it will be appreciated that they are merely illustrative and that modifications can be made to these embodiments without departing from the spirit and scope of the invention. Thus, the scope of the invention is intended to be defined only in terms of the following claims as may be amended, with each claim being expressly incorporated into this Description of Specific Embodiments as an embodiment of the invention.

CLAIMS

What is claimed is:

1. A speaker system comprising:

an audio amplifier;

a loudspeaker;

a wireless communications module; and

an electronic switch for receiving an audio signal from an audio source and routing the audio signal to the audio amplifier or the wireless communications module, wherein the electronic switch routes the audio signal to the wireless communications module upon formation of a wireless link by the wireless communications module.

2. The speaker system of claim 1, wherein the electronic switch comprises a field effect transistor, relay, or microelectromechanical switch.

3. The speaker system of claim 2, wherein the field effect transistor, relay, or microelectromechanical switch is controlled using a programmed input/output.

4. The speaker system of claim 1, wherein the wireless communications module utilizes a Bluetooth standard.

5. The speaker system of claim 1, wherein the wireless communications module utilizes an IEEE 802.11 or DECT standard.

6. The speaker system of claim 1, further comprising:

a wireless headset comprising a headset wireless communications module and a headset speaker, wherein the headset wireless communications module forms the wireless link upon activation of the wireless headset and receives the audio signal for output to the headset speaker.

7. The speaker system of claim 6, further comprising:

a headset docking station for receiving the wireless headset, wherein the wireless headset is automatically activated upon removal from the headset docking station and automatically deactivated when placed in the headset docking station.

8. An audio system comprising:

an audio source device comprising a first wireless communications module;

a loudspeaker system comprising

an audio amplifier;

a loudspeaker for receiving an amplified audio signal from the audio amplifier;

a second wireless communications module for receiving an audio signal from the first wireless communications module over a first wireless link, wherein the second wireless communications module comprises a switch for routing the audio signal to the audio amplifier or transmitting the audio signal over a second wireless link with a wireless headset upon activation of the wireless headset.

9. The audio system of claim 8, wherein the switch comprises a field effect transistor, relay, or microelectromechanical switch.

10. The audio system of claim 9, wherein the field effect transistor, relay, or microelectromechanical switch is controlled using a programmed input/output.

11. The audio system of claim 8, wherein the first wireless communications module, second wireless communications module, and third wireless communications module utilize a Bluetooth standard.

12. The audio system of claim 8, wherein the first wireless communications module, second wireless communications module, and third wireless communications module utilize an IEEE 802.11 or DECT standard.

13. The audio system of claim 8, further comprising:

a headset docking station for receiving the wireless headset, wherein the wireless headset is automatically activated upon removal from the headset docking station and automatically deactivated when placed in the headset docking station.

14. A method for automatically routing an audio signal comprising:

providing a speaker system comprising a loudspeaker, a first wireless communications module, and an electronic switch;

providing a wireless headset comprising a second wireless communications module and a headset speaker;

receiving an audio signal at the speaker system from an audio source device;

automatically setting the electronic switch to a first position to route the audio signal to the loudspeaker or to a second position to route the audio signal to the first wireless communications module, wherein the electronic switch is set to the second position upon activation of the wireless headset and formation of a wireless link between the first wireless communications module and the second wireless communications module and the electronic switch is set to the first position upon deactivation of the wireless headset and termination of the wireless link.

15. The method of claim 14, wherein the first wireless communications module and the second wireless communications module utilize a Bluetooth standard.

16. The method of claim 14, wherein the first wireless communications module and the second wireless communications module utilize an IEEE 802.11 standard or a DECT standard.

17. The method of claim 14, wherein the audio source device comprises a third wireless communications module and the audio signal is transmitted from the third wireless communications module to the first wireless communications module.

18. The method of claim 14, further comprising outputting the audio signal at the headset speaker when the electronic switch is set to the second position.

19. A method for automatically routing an audio signal comprising:

providing a speaker system comprising a loudspeaker, a first wireless communications module, and an electronic switch;

providing a wireless headset comprising a second wireless communications module and a headset speaker;

receiving an audio signal at the speaker system from an audio source device;

setting the electronic switch to route the audio signal to the loudspeaker;

activating the wireless headset and establishing a wireless link between the first wireless communications module and the second wireless communications module;

responsively setting the electronic switch to route the audio signal to the first wireless communications module; and

transmitting the audio signal from the first wireless communications module to the second wireless communications module over the wireless link; and

outputting the audio signal at the headset speaker.

20. The method of claim 19, wherein the first wireless communications module and the second wireless communications module utilize a Bluetooth standard.

21. The method of claim 19, wherein the first wireless communications module and the second wireless communications module utilize an IEEE 802.11 standard or a DECT standard.

22. The method of claim 19, wherein the audio source device comprises a third wireless communications module and the audio signal is transmitted from the third wireless communications module to the first wireless communications module.

23. A speaker system comprising:

an amplifier means for amplifying an audio signal;

a loudspeaker means for outputting the audio signal;

a wireless communications means for forming a wireless link; and

a switching means for routing the audio signal to the amplifier means or wireless communications means, wherein the switching means routes the audio signal to the wireless communications means upon formation of the wireless link.

24. The speaker system of claim 23, further comprising a wireless headset means for forming the wireless link with the wireless communications means and receiving the audio signal.

25. The speaker system of claim 24, further comprising a docking means for receiving the wireless headset means, wherein the wireless headset means is automatically activated upon removal from the docking means and automatically deactivated when placed in the docking means.

26. An audio system comprising:
an audio source device comprising a first wireless communications module;
a loudspeaker system comprising:
an audio amplifier;
a loudspeaker for receiving an amplified audio signal from the audio amplifier; and
a second wireless communications module for receiving the audio signal from the first wireless communications module over a first wireless link;
a wireless headset comprising:
a headset speaker; and
a third wireless communications module for receiving the audio signal from the first wireless communications module over a second wireless link, wherein the audio source device routes the audio signal to the wireless headset upon activation of the wireless headset and routes the audio signal to the loudspeaker system upon deactivation of the wireless headset.

27. The audio system of claim 26, wherein the first wireless communications module, second wireless communications module, and third wireless communications module utilize a Bluetooth standard.

28. The audio system of claim 26, wherein the first wireless communications module, second wireless communications module, and third wireless communications module utilize an IEEE 802.11 or DECT standard.

29. The audio system of claim 26, further comprising:
a headset docking station for receiving the wireless headset, wherein the wireless headset is automatically activated upon removal from the headset docking station and automatically deactivated when placed in the headset docking station.

30. An audio system comprising:

a first audio source device;

a second audio source device comprising a first wireless communications module;

a wireless headset comprising a second wireless communications module; and

a loudspeaker system comprising

an audio amplifier for receiving an audio signal from the first audio source device;

a loudspeaker for receiving an amplified audio signal from the audio amplifier; and

a third wireless communications module, wherein the third wireless communications module receives a loudspeaker mute command from the second wireless communications module upon activation of the wireless headset and formation of a wireless link between the first wireless communications module and the second wireless communications module.

31. The audio system of claim 30, wherein the first wireless communications module, second wireless communications module, and third wireless communications module utilize a Bluetooth standard.

32. The audio system of claim 30, wherein the first wireless communications module, second wireless communications module, and third wireless communications module utilize an IEEE 802.11 or DECT standard.

33. The audio system of claim 30, further comprising:

a headset docking station for receiving the wireless headset, wherein the wireless headset is automatically activated upon removal from the headset docking station and automatically deactivated when placed in the headset docking station.

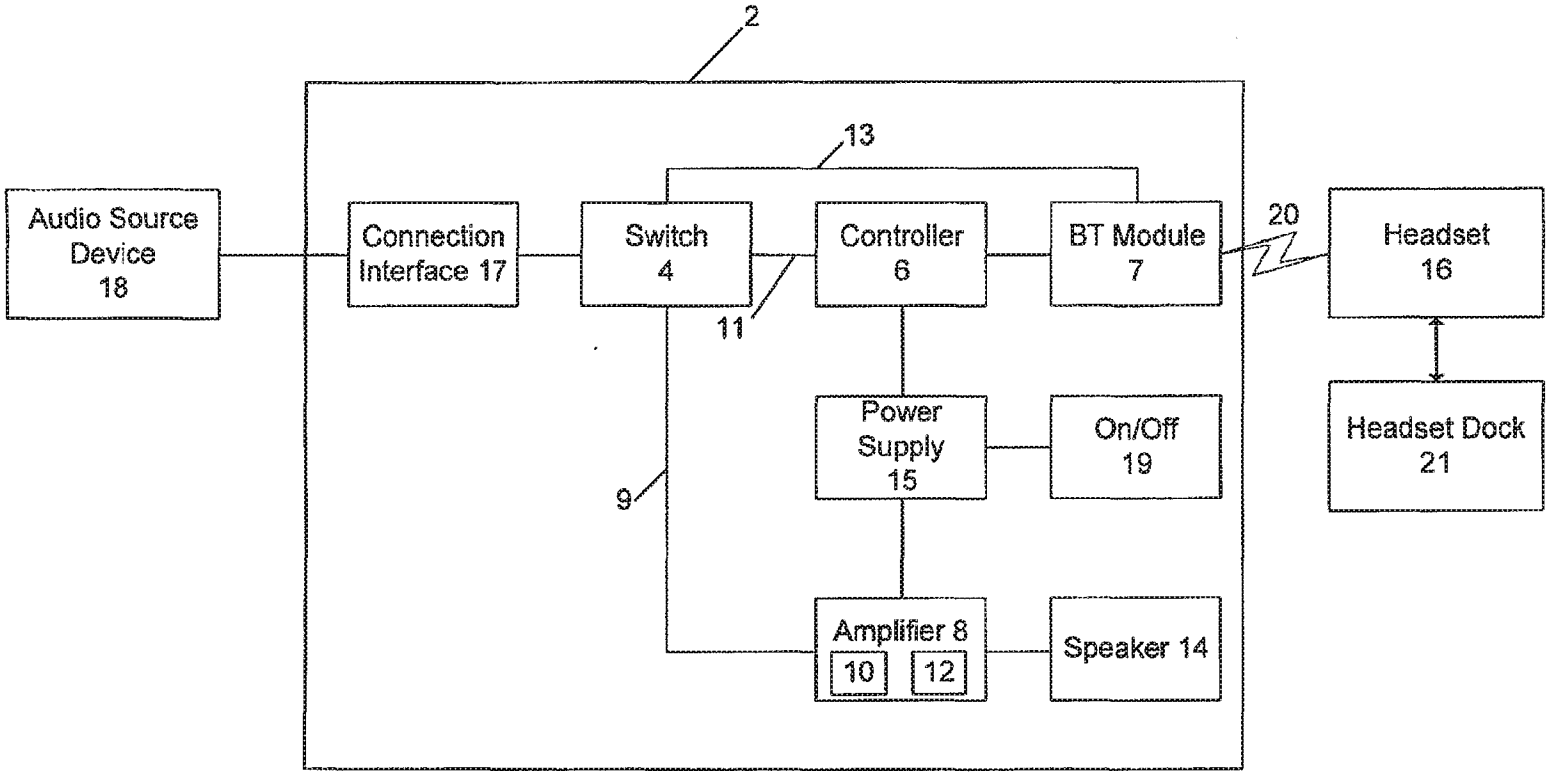
2
13
Audio Source Device 18
Connection Interface 17
Switch 4
Controller 6
BT Module 7
20
Headset 16
11
Power Supply 15
On/Off 19
Headset Dock 21
9
Amplifier 8
10
12
Speaker 14

FIG. 1

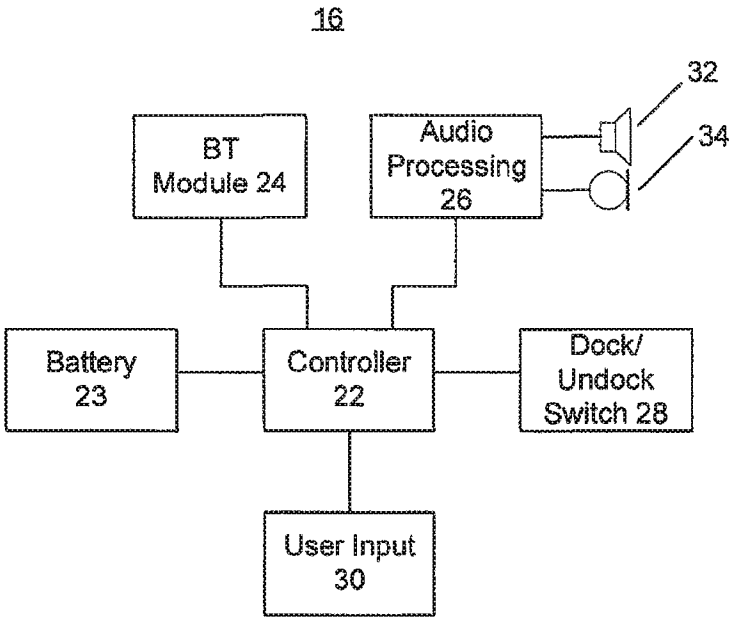
16
32
34
BT Module 24
Audio Processing 26
Battery 23
Controller 22
Dock/ Undock Switch 28
User Input 30

FIG. 2

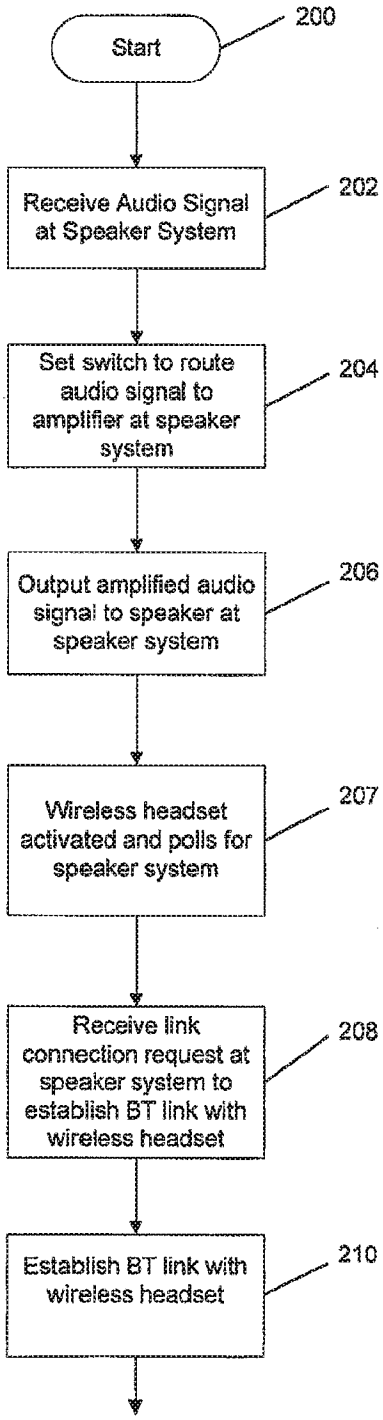
Start
200
Receive Audio Signal at Speaker System
202
Set switch to route audio signal to amplifier at speaker system
204
Output amplified audio signal to speaker at speaker system
206
Wireless headset activated and polls for speaker system
207
Receive link connection request at speaker system to establish BT link with wireless headset
208
Establish BT link with wireless headset
210

FIG. 3A

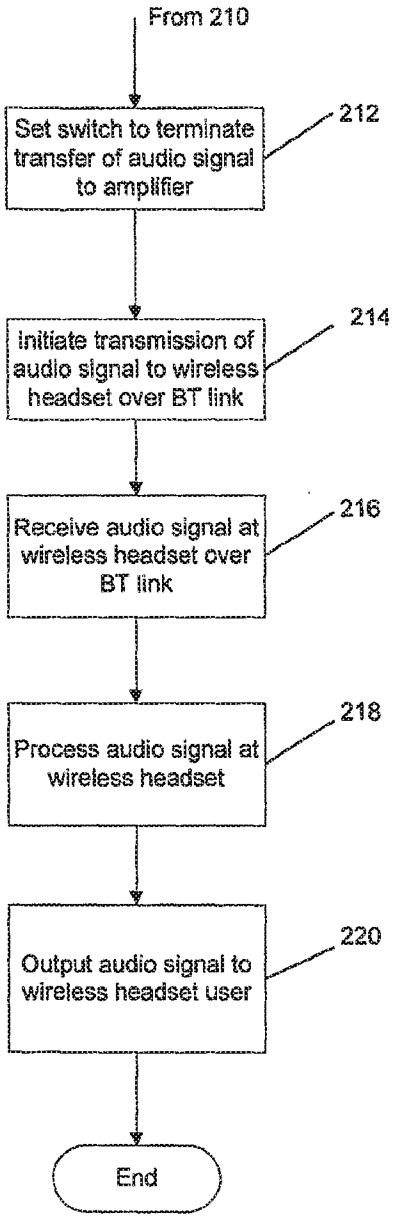
From 210
Set switch to terminate transfer of audio signal to amplifier
212
Initiate transmission of audio signal to wireless headset over BT link
214
Receive audio signal at wireless headset over BT link
216
Process audio signal at wireless headset
218
Output audio signal to wireless headset user
220
End

FIG. 3B

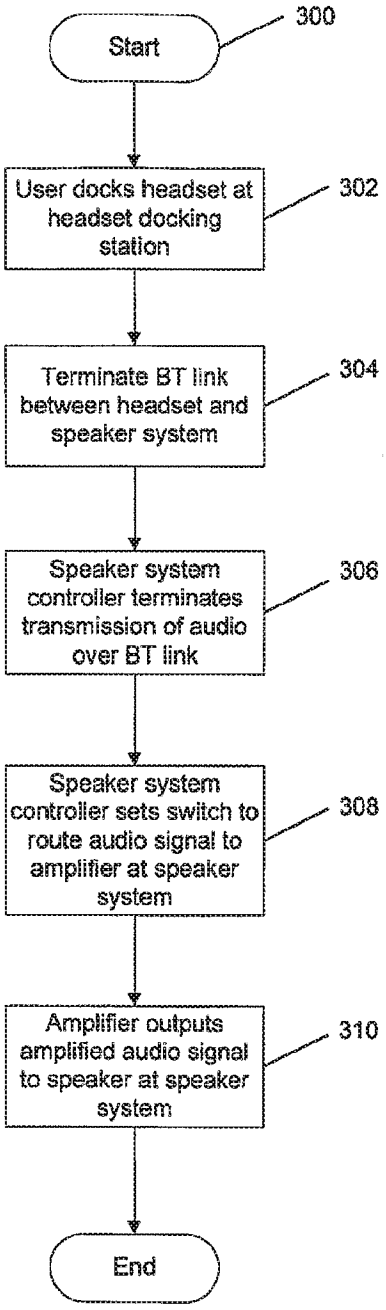
Start
300
User docks headset at headset docking station
302
Terminate BT link between headset and speaker system
304
Speaker system controller terminates transmission of audio over BT link
306
Speaker system controller sets switch to route audio signal to amplifier at speaker system
308
Amplifier outputs amplified audio signal to speaker at speaker system
310
End

FIG. 4

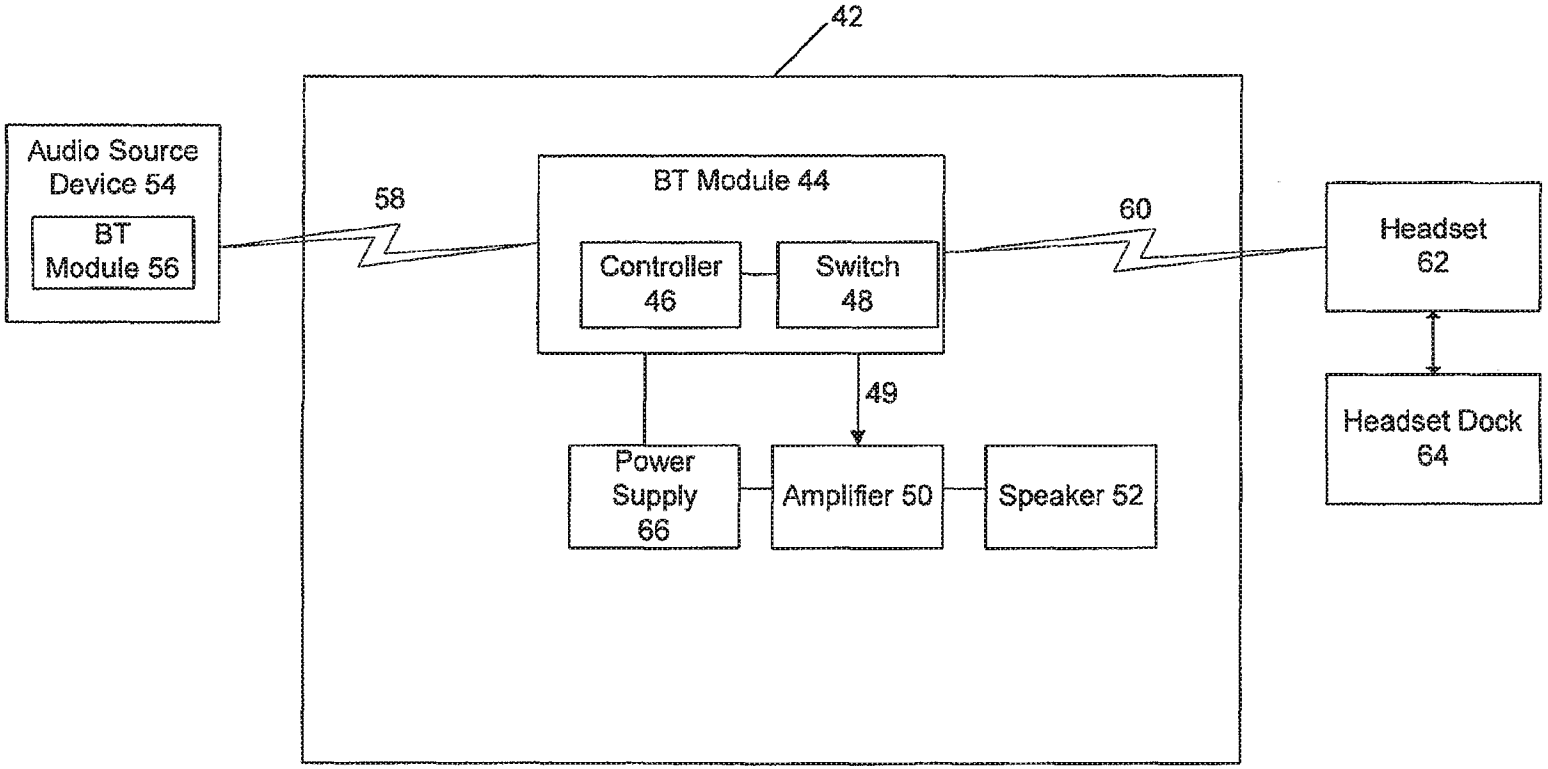
42
Audio Source Device 54
BT Module 56
58
BT Module 44
Controller 46
Switch 48
60
Headset 62
49
Power Supply 66
Amplifier 50
Speaker 52
Headset Dock 64

FIG. 5

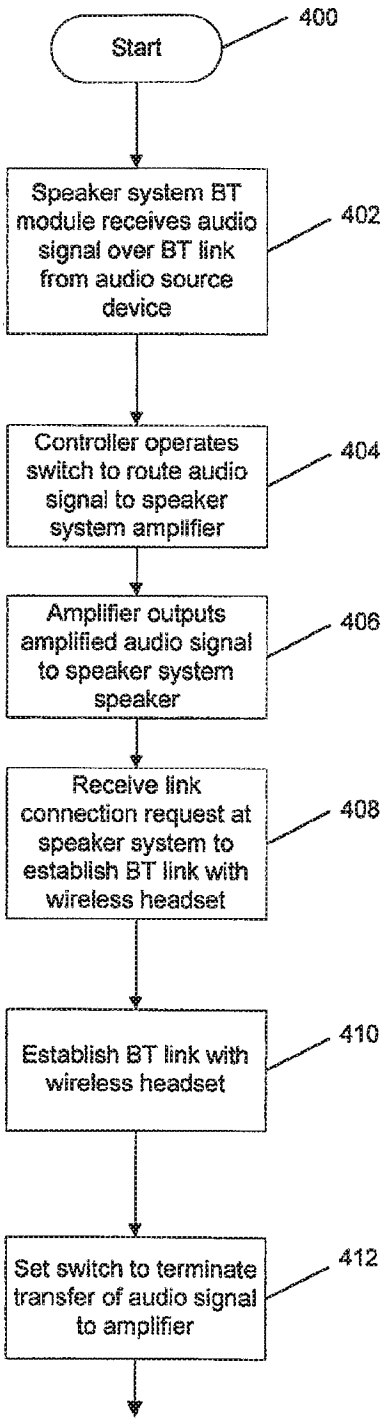
Start
400
Speaker system BT module receives audio signal over BT link from audio source device
402
Controller operates switch to route audio signal to speaker system amplifier
404
Amplifier outputs amplified audio signal to speaker system speaker
406
Receive link connection request at speaker system to establish BT link with wireless headset
408
Establish BT link with wireless headset
410
Set switch to terminate transfer of audio signal to amplifier
412

FIG. 6A

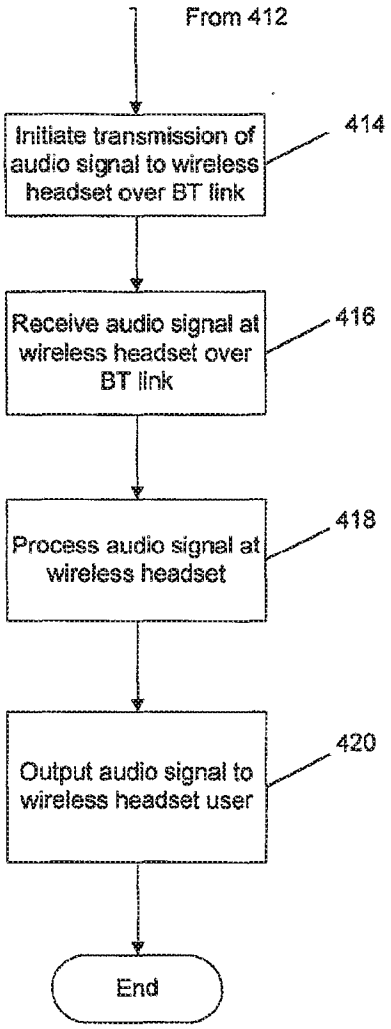
From 412
Initiate transmission of audio signal to wireless headset over BT link
414
Receive audio signal at wireless headset over BT link
416
Process audio signal at wireless headset
418
Output audio signal to wireless headset user
420
End

FIG. 6B

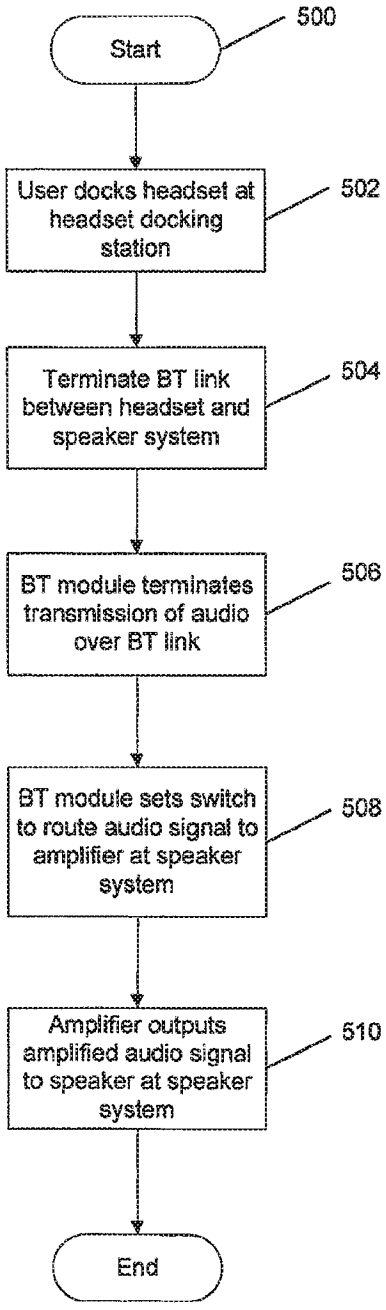
Start
500
User docks headset at headset docking station
502
Terminate BT link between headset and speaker system
504
BT module terminates transmission of audio over BT link
506
BT module sets switch to route audio signal to amplifier at speaker system
508
Amplifier outputs amplified audio signal to speaker at speaker system
510
End

FIG. 7

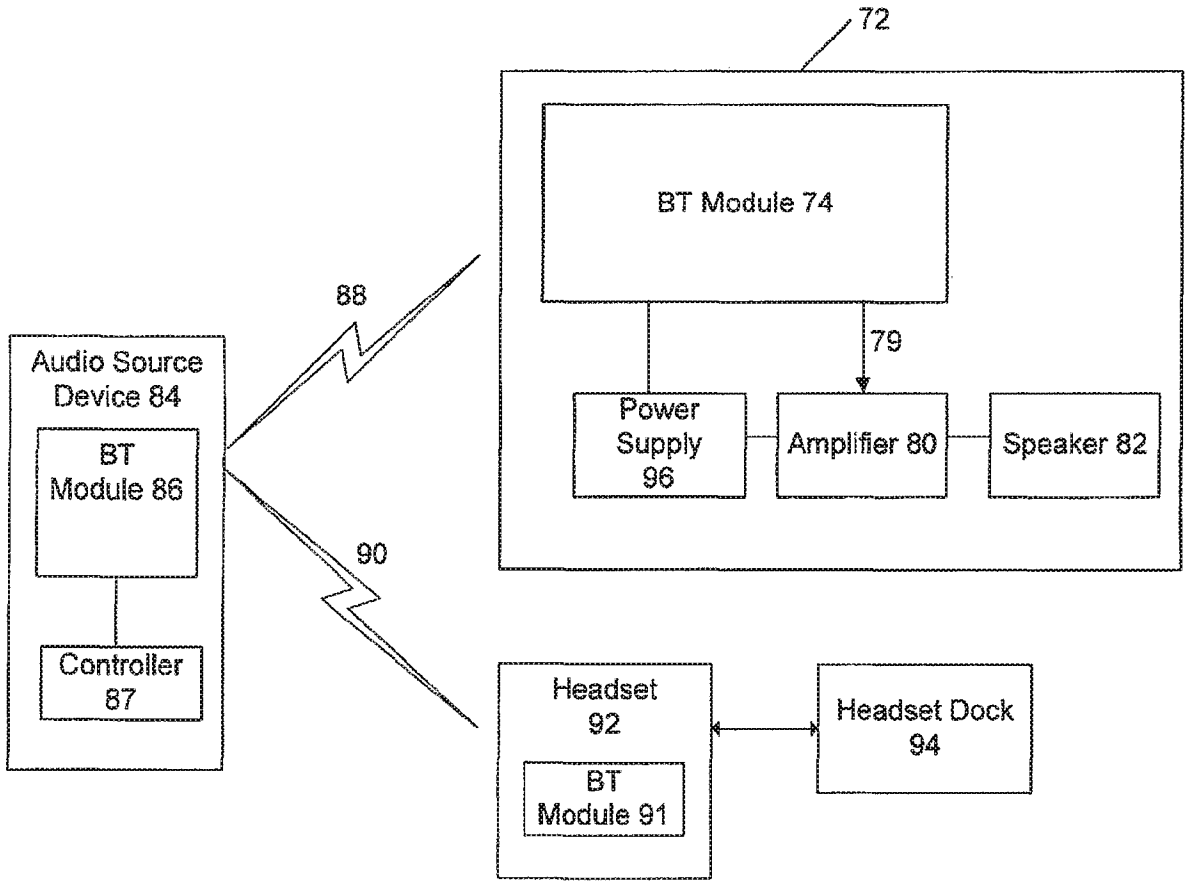
72
BT Module 74
88
79
Audio Source Device 84
BT Module 86
Power Supply 96
Amplifier 80
Speaker 82
90
Controller 87
Headset 92
BT Module 91
Headset Dock 94

FIG. 8

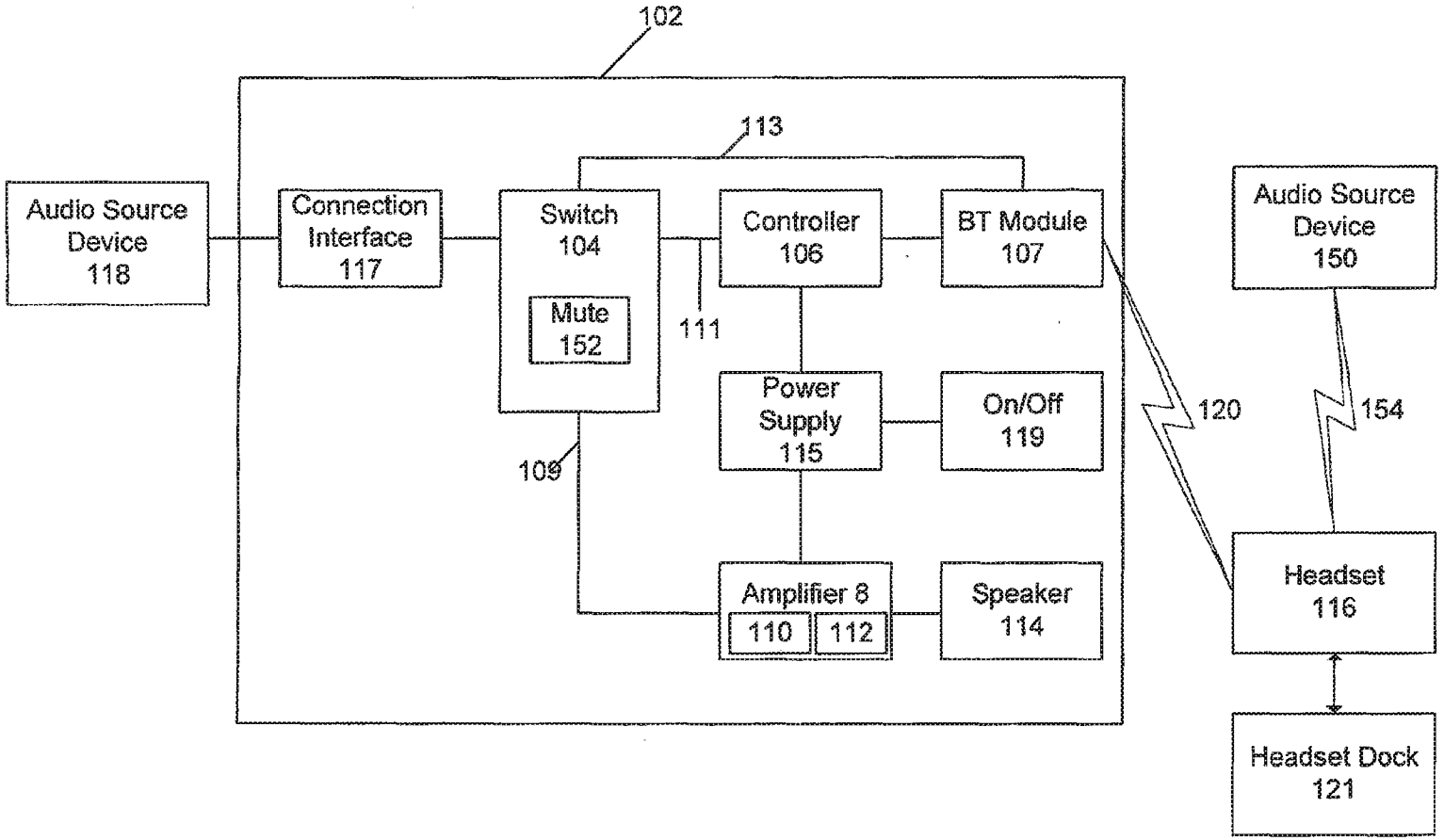
102
113
Audio Source Device 118
Connection Interface 117
Switch 104
Mute 152
111
Controller 106
BT Module 107
Audio Source Device 150
Power Supply 115
On/Off 119
109
120
154
Amplifier 8
110
112
Speaker 114
Headset 116
Headset Dock 121

FIG. 9

Espacenet

Bibliographic data: CN204090096 (U) — 2015-01-07

Earphone assembly of bluetooth sound box

Inventor(s): HUANG MIAN; LING ZHENQING ± (HUANG MIAN, ; LING ZHENQING)

Applicant(s): SHENZHEN YOOBAO TECHNOLOGY CO LTD ± (SHENZHEN YOOBAO TECHNOLOGY CO., LTD)

Classification: - international: ***H04R1/10; H04R1/20***
- cooperative:

Application number: CN20142512471U 20140905

Priority number(s): CN20142512471U 20140905

Abstract of CN204090096 (U)

The utility model discloses an earphone assembly of a bluetooth sound box. A sound box loudspeaker is electrically connected with a sound box bluetooth chip, a side surface of a sound box shell is provided with a groove connecting seat, a wall of the inner side of the connecting seat is provided with a charging contact, the bottom of the connecting seat is provided with a sound box detection contact, a wall of the middle part of an earphone shell is provided with a charging terminal, the charging terminal corresponds to the charging contact, the bottom of the earphone shell is provided with an earphone detection contact, and the earphone detection contact corresponds to the sound box detection contact. When a bluetooth earphone is inserted into the connecting seat, the earphone bluetooth can be rapidly turned off, the sound box and the bluetooth of the sound box are turned on, and the sound box can be wirelessly connected with digital equipment via bluetooth; the earphone can be charged via the sound box so that the battery life is extended, a magnet can accurately absorb the earphone so that the charging contact and the groove can be stably contacted; and when users listen to songs via the sound box, a phone is accessed, the phone can be directly answered via the sound box, or the earphone can be taken out so that a private conversation can be made via the earphone.

Notice

DESCRIPTION CN 204090096

The utility model discloses a Bluetooth speaker earphone assembly, the speaker speaker is electrically connected with a speaker Bluetooth chip, a side of the speaker housing is provided with a groove connecting seat, and a charging contact is arranged on an inner side wall of the connecting seat. a speaker detecting contact is disposed at a bottom of the connecting seat; a charging terminal is disposed on a middle side wall of the earphone housing, the charging terminal corresponds to a charging contact, and an earphone detecting contact is disposed at a bottom of the earphone housing. The earphone detection contact corresponds to a speaker detection contact. After the Bluetooth earphone of the utility model is inserted into the connection base, the Bluetooth of the earphone can be quickly turned off, the speaker is activated, and the Bluetooth of the speaker is activated, so that the speaker is wirelessly connected with the digital device through the Bluetooth; the earphone can be charged through the speaker to improve the endurance; the magnet can Accurately absorb the earphones, so that the two can be in stable contact; when the user listens to the song using the speaker, the user can choose to use the speaker to directly connect, or take out the earphone to make a private call through the earphone.

Bluetooth speaker earphone assembly

Technical field

The utility model relates to the field of bluetooth wireless connection digital accessories, in particular to a bluetooth speaker earphone assembly.

Background technique

The existing Bluetooth speaker refers to a built-in Bluetooth chip, which replaces the traditional wired connected audio device with a Bluetooth connection, and is connected to a Bluetooth playback device such as a mobile phone tablet and a notebook to achieve a convenient and quick purpose. At present, the Bluetooth speaker is mainly portable speaker, the shape is generally small and portable, and the Bluetooth speaker technology is gradually being valued and accepted by consumers with its convenient human characteristics. The common bluetooth speakers on the market are mostly mono speakers (single speaker unit)), there are also some multi-channel speakers (two or more speaker units) with excellent sound quality.

Bluetooth speakers are used to apply Bluetooth technology to traditional digital and multimedia speakers, allowing users to avoid the annoying wires and listen to music in a variety of ways. Since the advent of Bluetooth speakers, with the development of smart terminals, it has been widely concerned by users such as mobile phones. Bluetooth technology makes it possible to wirelessly speaker.

However, the existing Bluetooth technology is a one-to-one connection, usually the mobile phone will match the Bluetooth headset to conveniently answer the call, and when the Bluetooth headset and the Bluetooth speaker are simultaneously turned on, it is cumbersome to switch between the two. At the same time, since the Bluetooth headset is a mobile device, it needs to be charged frequently, and the Bluetooth headset generally does not have its own power display module, and cannot accurately know the residual state of the power.

Utility model content

In view of the above problems, the present invention aims to provide a Bluetooth speaker earphone assembly that can be used independently and can easily switch between Bluetooth connection and convenient Bluetooth headset charging.

To achieve this technical purpose, the solution of the present invention is:

A Bluetooth speaker earphone assembly includes a speaker, an earphone; the earphone includes a headphone housing, a headset Bluetooth chip, a battery, a headphone microphone, a headphone speaker, and the battery, the earphone microphone and the earphone speaker are respectively electrically connected with the earphone Bluetooth chip; The speaker comprises a speaker housing, a speaker Bluetooth chip, a speaker speaker, a power supply unit, the power supply module and the speaker speaker are electrically connected to the speaker Bluetooth chip, and the earphone Bluetooth chip and the speaker Bluetooth chip are independent of each other; the speaker housing a groove connecting seat for inserting a Bluetooth earphone is disposed, the inner side wall of the connecting seat is provided with a charging contact and a magnet, and the charging contact is electrically

connected to the power supply unit; the middle side wall of the earphone housing is disposed There is a charging terminal and a magnet, and the charging terminal is disposed corresponding to the charging contact. W hen the Bluetooth earphone is inserted into the connecting seat, the magnetic contact is magnetically attracted to each other, the charging contact is electrically connected to the charging terminal, and the power supply unit charges the Bluetooth earphone; the bottom of the connecting seat a speaker detecting contact is disposed; an earphone detecting contact is disposed at a bottom of the earphone housing, and the ear D etecting contact with the corresponding speaker detection contact.

Preferably, the earphone detecting contact and the speaker detecting contact are touch switches; or the earphone detecting contact is a communication interface, and the speaker detecting contact is a communication plug.

Preferably, the speaker further comprises a speaker microphone, and the speaker microphone is electrically connected to the speaker Bluetooth chip.

Preferably, the back of the speaker housing is provided with a U SB interface and a T F card socket.

Preferably, the front side of the speaker housing is further provided with a control panel for adjustment and display.

A dvantageously, said charging contact comprises a positive contact, a negative contact and a leakage detecting contact.

The utility model has the beneficial effects that after the Bluetooth earphone is inserted into the connection base, the Bluetooth of the earphone can be quickly turned off, the speaker is activated and the Bluetooth of the speaker is activated, so that the speaker is wirelessly connected with the digital device through the Bluetooth; at the same time, the earphone can be charged through the speaker, and the earphone can be upgraded. The effective endurance ability; the magnet can accurately absorb the earphone, so that the charging contact and the notch can be stably contacted to avoid misconnection or leakage; when the user listens to the song using the speaker, the user can choose to directly connect with the speaker, or T ake out the headset and make a private call through the headset.

D RA W IN G S

Figure 1 is a schematic view of the structure of the present invention;

Figure 2 is a schematic rear view of the structure of the present invention;

Figure 3 is a schematic view of the middle portion of the connection state of the present invention;

Figure 4 is a bottom view of the connection state of the present invention;

Figure 5 is a bottom view of the connection state of the communication interface of the present invention;

Figure 6 is a cross-sectional view of the present invention;

Figure 7 is a structural block diagram of the speaker of the present invention;

Figure 8 is a structural block diagram of the earphone of the present invention.

detailed description

The present invention will be further described in detail below with reference to the accompanying drawings and specific embodiments.

As shown in FIG. 1, 3, 7, and 8, the specific embodiment of the present invention is a Bluetooth speaker earphone assembly, including a speaker and an earphone, and the earphone includes a headphone housing 1, a headset Bluetooth chip, and a battery. The earphone microphone, the earphone speaker, the battery, the earphone microphone and the earphone speaker are respectively electrically connected to the earphone blue chip, the speaker comprises a speaker housing 2, a speaker bluetooth chip, a speaker speaker, and the speaker speaker is electrically connected with the speaker blue chip. The side of the speaker housing 2 is provided with a groove connecting seat 3, the inner side wall of the connecting seat 3 is provided with a charging contact 8, the bottom of the connecting seat 3 is provided with a speaker detecting contact 5;

As shown in FIG. 4and FIG. 6, a charging terminal 7is disposed on a middle side wall of the earphone housing 1 , the charging terminal 7corresponds to a charging contact 8, and an earphone detecting contact is disposed at a bottom of the earphone housing 1. 4 The earphone detecting contact 4corresponds to the speaker detecting contact 5

As shown in FIG. 4, the earphone detecting contact and the speaker detecting contact are touch switches. Under normal circumstances, the headset is connected to the Bluetooth of the mobile phone, and the speaker is in a sleep state. After entering the room, after inserting the earphone into the connector, the earphone detection contact is connected with the speaker detection contact, the earphone Bluetooth chip of the earphone stops working, the speaker's Bluetooth chip is activated, and the mobile phone automatically connects with the speaker Bluetooth chip, thereby realizing Quick switching function; when the headset is taken off the music is paused, the headset is put back into the music and replayed and put in. At the same time, the earphones are attracted to the vicinity of the charging contacts by the magnet, and the speaker starts to charge the headphones. When leaving the room, remove the earphone, the speaker automatically enters the sleep state, the headset's Bluetooth chip is activated, and the mobile phone is paired and connected, the switching process is very smooth.

As shown in FIG. 5, a general Bluetooth headset is provided with a micro USB communication interface for independent charging or external connection, the earphone detecting contact is a communication interface, and the speaker detecting contact is a micro USB communication plug. The design can be directly connected to the communication plug through the communication interface, and the Bluetooth on/off switching process of the two can be realized through the respective chips.

As shown in FIG. 3, the inner side wall of the connecting base 3is provided with a magnet 6, and the central side of the earphone housing 1is provided with a magnet 6. The diameter of the connecting seat is larger than the diameter of the earphone casing. The magnet is divided into two groups, and the stable absorption of the Bluetooth earphone can be urged toward the inner wall of the connecting seat, so that the charging terminal and the charging contact are stably connected.

As shown in FIG. 2, the back of the speaker housing 1is provided with a power cord interface 10, a USB interface 9and a TF card slot 11. The speakers can be connected to the mains via the power line interface or via the built-in power supply unit. The speaker can be connected to the mobile phone, and can be used as a mobile phone. It can also be used independently. The user can insert the external storage device through the USB interface and the TF card socket, and can use the Bluetooth speaker to read the music files on the external storage device.

The speaker further includes a speaker microphone, and the speaker microphone is electrically connected with the speaker blue chip. When the microphone is in the independent office, the user can smoothly talk to others

without wearing a bluetooth headset.

As shown in FIG. 1, the front side of the speaker housing is also provided with a control panel 12 for adjustment and display. Users can see song information, adjust volume, select songs and other basic operations through the control panel.

To ensure stable and safe charging, the charging contacts include a positive contact, a negative contact, and a leakage detecting contact (not shown). The leakage detection contact can be used to assist in detecting whether a leakage has occurred, and to ensure that the detection charge is normal.

The above is only a preferred embodiment of the present invention, and is not intended to limit the present invention. Any minor modifications, equivalent substitutions and improvements made to the above embodiments in accordance with the technical spirit of the present invention should be included in The technical solution of the utility model is within the protection scope.

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(12)实用新型专利

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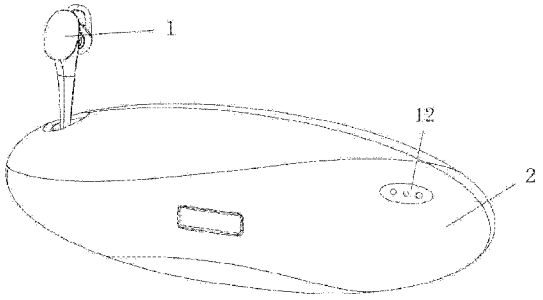
(54)实用新型名称

一种蓝牙音箱耳机组件

(57)摘要

本实用新型公开了一种蓝牙音箱耳机组件，所述音箱扬声器与音箱蓝牙芯片电连接，所述音箱壳体侧面设置有凹槽连接座，所述连接座内侧边壁设置有充电触点，所述连接座底部设置有音箱检测触点；所述耳机壳体中部边壁上设置有充电端子，所述充电端子与充电触点相对应，所述耳机壳体底部设置有耳机检测触点，所述耳机检测触点与音箱检测触点相对应。本实用新型的蓝牙耳机插入连接座后，既可迅速关闭耳机蓝牙，启动音箱并启动音箱的蓝牙，使得音箱通过蓝牙与数码设备进行无线连接；耳机可以通过音箱进行充电，提升续航能力；磁铁可以准确吸附耳机，使得二者稳定接触；使用者在使用音箱听歌时，接入电话，可以选择用音箱直接接通，也可以取出耳机通过耳机进行私密通话。



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1. 一种蓝牙音箱耳机组件，包括音箱、耳机；所述耳机包括有耳机壳体、耳机蓝牙芯片、电池、耳机麦克风、耳机扬声器，所述电池、耳机麦克和耳机扬声器分别与耳机蓝牙芯片电连接；所述音箱包括音箱壳体、音箱蓝牙芯片、音箱扬声器、供电单元，所述供电模块和音箱扬声器与音箱蓝牙芯片电连接，其特征在于：

所述耳机蓝牙芯片和音箱蓝牙芯片各自相互独立；

所述音箱壳体上设置有用于插放蓝牙耳机的凹槽连接座，所述连接座内侧边壁设置有充电触点及磁铁，该充电触点与供电单元电连接；

所述耳机壳体中部边壁上设置有充电端子和磁铁，所述充电端子与充电触点相对应设置，当蓝牙耳机插入连接座时相互磁吸附，充电触点与充电端子电导通，供电单元对蓝牙耳机充电；

所述连接座底部设置有音箱检测触点；所述耳机壳体底部设置有耳机检测触点，所述耳机检测触点与音箱检测触点相对应。

2. 根据权利要求 1 所述的蓝牙音箱耳机组件，其特征在于：所述耳机检测触点和音箱检测触点均为触控开关；或者所述耳机检测触点为通讯接口，所述音箱检测触点为通讯插头。

3. 根据权利要求 2 任一条所述的蓝牙音箱耳机组件，其特征在于：所述音箱还包含有音箱麦克，所述音箱麦克与音箱蓝牙芯片电连接。

4. 根据权利要求 1-3 任一条所述的蓝牙音箱耳机组件，其特征在于：所述音箱壳体背面设置有 USB 接口和 TF 卡插口。

5. 根据权利要求 1-3 任一条所述的蓝牙音箱耳机组件，其特征在于：所述音箱壳体正面还设置有用于调节和显示的控制面板。

6. 根据权利要求 1-3 任一条所述的蓝牙音箱耳机组件，其特征在于：所述充电触点包括正极触点、负极触点和漏电检测触点。

一种蓝牙音箱耳机组件

技术领域

[0001] 本实用新型涉及蓝牙无线连接数码配件领域，具体涉及一种蓝牙音箱耳机组件。

背景技术

[0002] 现有蓝牙音箱指的是内置蓝牙芯片，以蓝牙连接取代传统线材连接的音响设备，通过与手机平板电脑和笔记本等蓝牙播放设备连接，达到方便快捷的目的。目前，蓝牙音箱以便携音箱为主，外形一般较为小巧便携，蓝牙音箱技术也凭借其方便人性的特点逐渐被消费者重视和接纳，市面上常见蓝牙音箱多为单声道音箱（单扬声单元），同时也涌现了一些音质优异的多声道音箱（两个或两个以上扬声单元）。

[0003] 蓝牙音箱就是将蓝牙技术应用在传统数码和多媒体音箱上，让使用者可以免除恼人电线的牵绊，自在地以各种方式聆听音乐。自从蓝牙音箱问世以来，随着智能终端的发展受到手机平板等用户的广泛关注。蓝牙技术让音箱无线化变为可能。

[0004] 可是现有的蓝牙技术为一对一的连接，通常手机会匹配蓝牙耳机方便接听电话，而当蓝牙耳机与蓝牙音箱同时开启时，在二者之间进行切换比较繁琐。同时由于蓝牙耳机为移动设备，需要经常充电，而蓝牙耳机一般不自带电量显示模块，无法准确知道其电量残余情况。

实用新型内容

[0005] 针对上述问题，本实用新型旨在提供一种既可独立使用又能便捷切换蓝牙连接及方便蓝牙耳机充电的蓝牙音箱耳机组件。

[0006] 为实现该技术目的，本实用新型的方案是：

[0007] 一种蓝牙音箱耳机组件，包括音箱、耳机；所述耳机包括有耳机壳体、耳机蓝牙芯片、电池、耳机麦克风、耳机扬声器，所述电池、耳机麦克和耳机扬声器分别与耳机蓝牙芯片电连接；所述音箱包括音箱壳体、音箱蓝牙芯片、音箱扬声器、供电单元，所述供电模块和音箱扬声器与音箱蓝牙芯片电连接，所述耳机蓝牙芯片和音箱蓝牙芯片各自相互独立；所述音箱壳体上设置有用于插放蓝牙耳机的凹槽连接座，所述连接座内侧边壁设置有充电触点及磁铁，该充电触点与供电单元电连接；所述耳机壳体中部边壁上设置有充电端子和磁铁，所述充电端子与充电触点相对应设置，当蓝牙耳机插入连接座时相互磁吸附，充电触点与充电端子电导通，供电单元对蓝牙耳机充电；所述连接座底部设置有音箱检测触点；所述耳机壳体底部设置有耳机检测触点，所述耳机检测触点与音箱检测触点相对应。

[0008] 作为优选，所述耳机检测触点和音箱检测触点均为触控开关；或者所述耳机检测触点为通讯接口，所述音箱检测触点为通讯插头。

[0009] 作为优选，所述音箱还包含有音箱麦克，所述音箱麦克与音箱蓝牙芯片电连接。

[0010] 作为优选，所述音箱壳体背面设置有 USB 接口和 TF 卡插口。

[0011] 作为优选，所述音箱壳体正面还设置有用于调节和显示的控制面板。

[0012] 作为优选，所述充电触点包括正极触点、负极触点和漏电检测触点。

[0013] 本实用新型的有益效果，蓝牙耳机插入连接座后，既可迅速关闭耳机蓝牙，启动音箱并启动音箱的蓝牙，使得音箱通过蓝牙与数码设备进行无线连接；同时耳机可以通过音箱进行充电，提升耳机的有效续航能力；磁铁可以准确吸附耳机，使得充电触点与槽口稳定接触，避免错接或漏电；使用者在使用音箱听歌时，接入电话，可以选择用音箱直接接通，也可以取出耳机通过耳机进行私密通话。

附图说明

[0014] 图 1 为本实用新型的结构示意图；

[0015] 图 2 为本实用新型的结构示意的后视图；

[0016] 图 3 为本实用新型的连接状态的中部示意图；

[0017] 图 4 为本实用新型的连接状态的底部示意图；

[0018] 图 5 为本实用新型的通讯接口的连接状态的底部示意图；

[0019] 图 6 为本实用新型的剖视图；

[0020] 图 7 为本实用新型的音箱的结构框图；

[0021] 图 8 为本实用新型的耳机的结构框图。

具体实施方式

[0022] 下面结合附图和具体实施例对本实用新型做进一步详细说明。

[0023] 如图 1、3、7、8 所示，本实用新型所述的具体实施例为一种蓝牙音箱耳机组件，包括音箱、耳机，所述耳机包括有耳机壳体 1、耳机蓝牙芯片、电池、耳机麦克风、耳机扬声器，所述电池、耳机麦克和耳机扬声器分别与耳机蓝牙芯片电连接，所述音箱包括音箱壳体 2、音箱蓝牙芯片、音箱扬声器，所述音箱扬声器与音箱蓝牙芯片电连接，所述音箱壳体 2 侧面设置有凹槽连接座 3，所述连接座 3 内侧边壁设置有充电触点 8，所述连接座 3 底部设置有音箱检测触点 5；

[0024] 如图 4、6 所示，所述耳机壳体 1 中部边壁上设置有充电端子 7，所述充电端子 7 与充电触点 8 相对应，所述耳机壳体 1 底部设置有耳机检测触点 4，所述耳机检测触点 4 与音箱检测触点 5 相对应。

[0025] 如图 4 所示，所述耳机检测触点和音箱检测触点均为触控开关。正常情况下，耳机与手机蓝牙连接，音箱处于休眠状态。进入房间后，将耳机插入连接座后，耳机检测触点与音箱检测触点对应连接，耳机的耳机蓝牙芯片停止工作，音箱的音箱蓝牙芯片启动，手机会自动与音箱蓝牙芯片进行连接，从而实现快速切换功能；当把耳机拿开音乐暂停，耳机放回音乐重新播放放进去。与此同时，耳机要通过磁铁吸附到充电触点附近，音箱开始为耳机进行充电。离开房间时，取下耳机，音箱自动进入休眠状态，耳机的耳机蓝牙芯片启动，并与手机进行配对连接，切换过程十分流畅。

[0026] 如图 5 所示，一般蓝牙耳机都会设置一个用于独立充电或者对外连接的的 microUSB 通讯接口，所述耳机检测触点为通讯接口，所述音箱检测触点为 microUSB 通讯插头。该设计可以直接通过通讯接口与通讯插头的配对电连接，通过各自的芯片实现二者的蓝牙通断的切换过程。

[0027] 如图 3 所示，所述连接座 3 内侧边壁设置磁铁 6，所耳机壳体 1 中部侧面对应设置

有磁铁 6。所述连接座的口径大于耳机外壳的直径，所述磁铁分为上下两组，可以将蓝牙耳机稳定的吸附靠向连接座内壁，使得充电端子与充电触点稳定连接。

[0028] 如图图 2 所示，所述音箱壳体 1 背面设置有电源线接口 10，USB 接口 9 和 TF 卡插口 11。音箱既可以通过电源线接口接入市电，也可以通过内置的供电单元进行供电。音箱既可以连接手机，充当手机的外放，也可以独立使用，使用者可以通过 USB 接口和 TF 卡插口插入外接储存设备，可以使用蓝牙音箱读取外置储存设备上的音乐文件。

[0029] 所述音箱还包含有音箱麦克，所述音箱麦克与音箱蓝牙芯片电连接，通过音箱麦克，在独立办公室内时，使用者可以无需佩戴蓝牙耳机，顺畅的与他人进行通话。

[0030] 如图 1 所示所述音箱壳体正面还设置有用于调节和显示的控制面板 12。使用者可以通过控制面板看到歌曲信息，调节音量，选择歌曲等基本操作。

[0031] 为了确保充电的稳定和安全，所述充电触点包括正极触点、负极触点和漏电检测触点（图中未画出）。漏电检测触点可用于辅助检测是否发生漏电，确保检测充电正常。

[0032] 以上所述，仅为本实用新型的较佳实施例，并不用以限制本实用新型，凡是依据本实用新型的技术实质对以上实施例所作的任何细微修改、等同替换和改进，均应包含在本实用新型技术方案的保护范围之内。

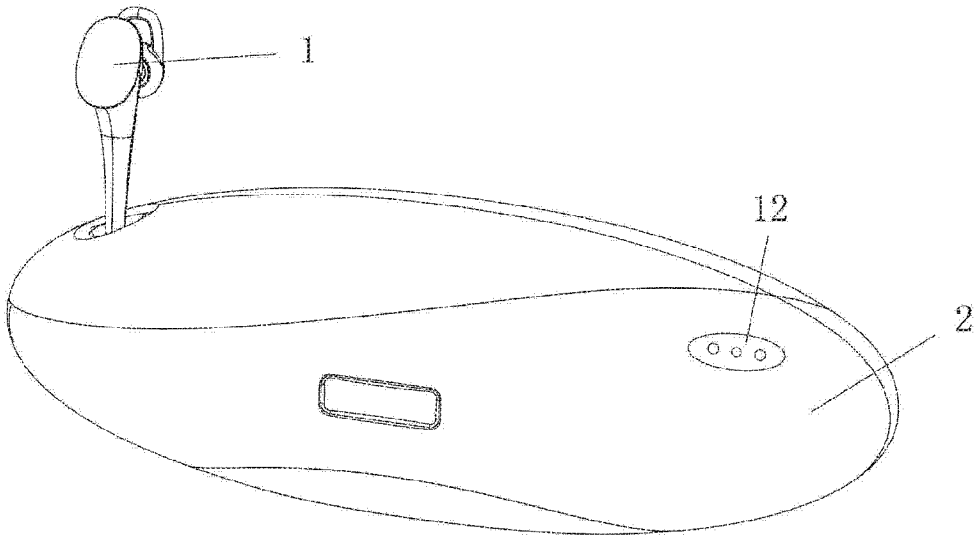

图 1

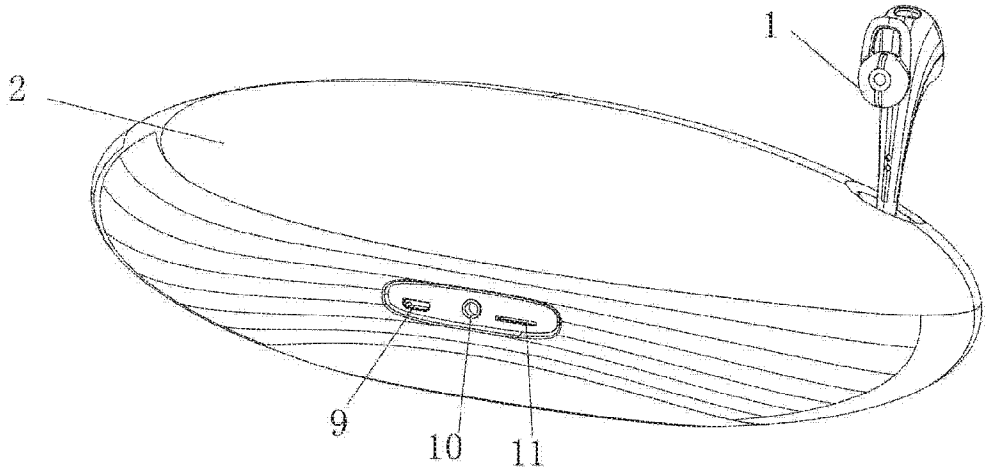

图 2

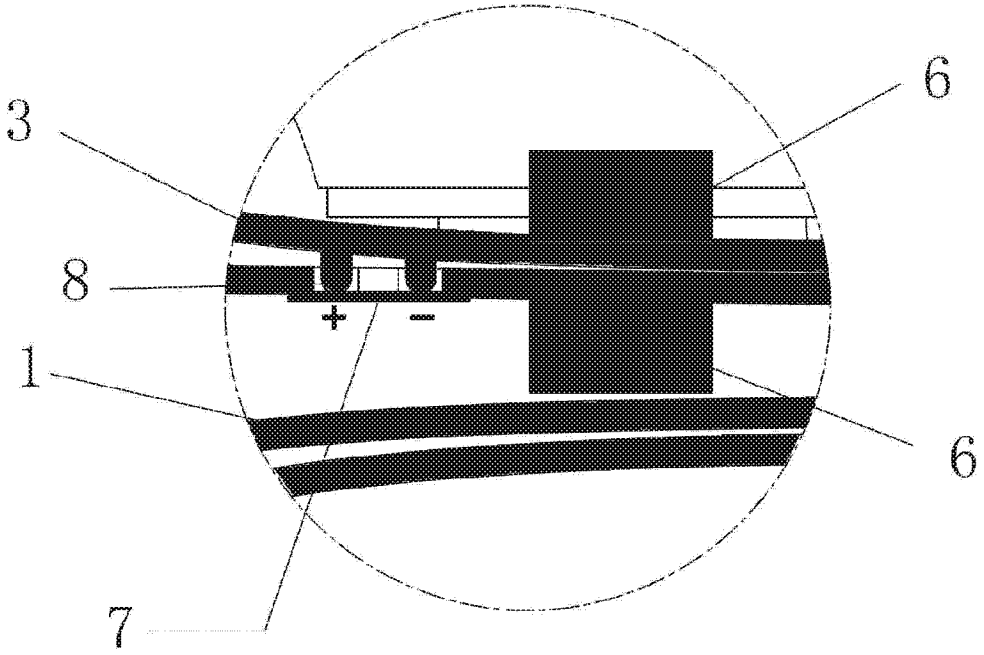

图 3

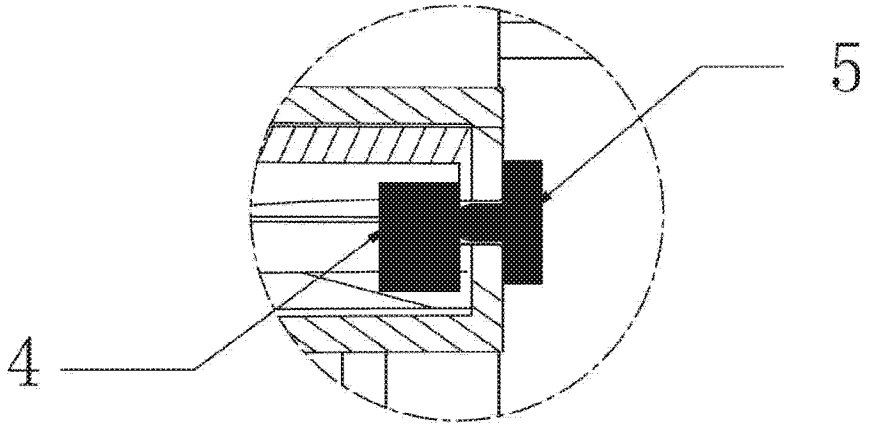

图 4

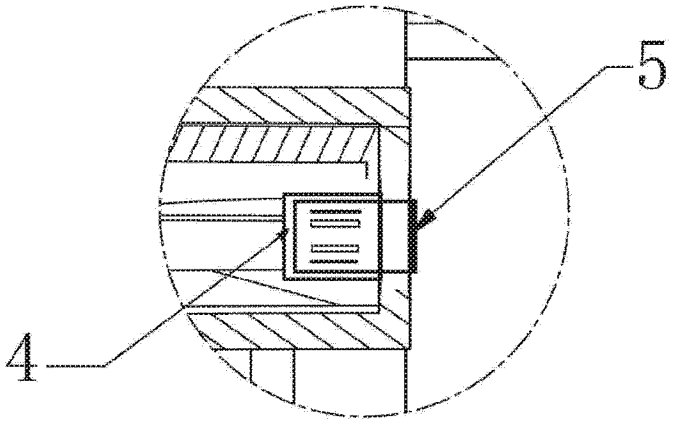

图 5

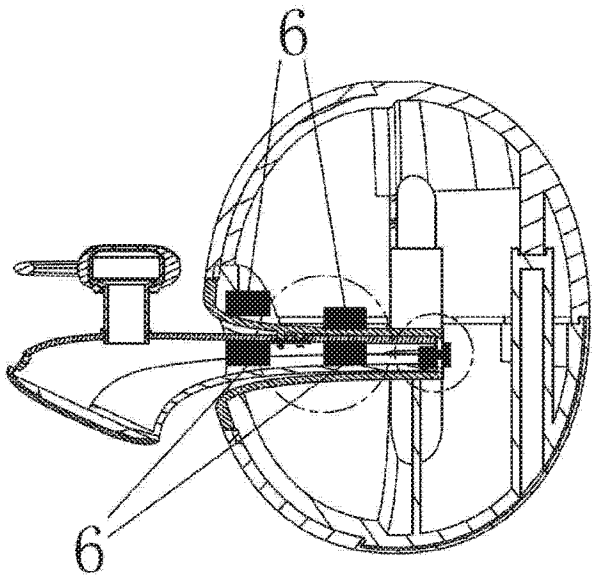

图 6

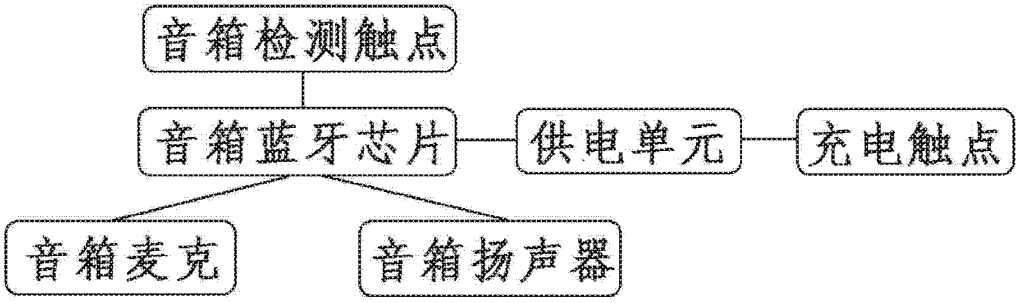

图 7

8

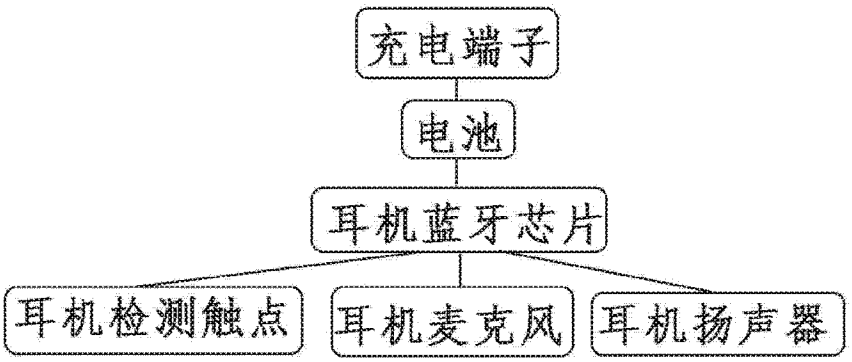

图 8

Espacenet

Bibliographic data: JP2012100248 (A) — 2012-05-24

CRADLE

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Applicant(s): SONY CORP ± (SONY CORP)

Classification: - international: ***H01M10/44; H01M2/10; H04R1/10***
- cooperative:

Application number: JP20110194061 20110906 Global Dossier

Priority number(s): JP20100225031 20101004 ; JP20110194061 20110906

Abstract of JP2012100248 (A)

PROBLEM TO BE SOLVED: To provide a cradle that can compactly store headphones having a long cord without entangling the cord and can charge the headphones.SOLUTION: A cradle 100 includes a cradle body 200 and a lid connected for opening/closing motion to the cradle body 200. The cradle body 200 has a unit storage portion 210 formed on an upper surface to store an L channel unit 3 and an R channel unit 4 of a headset 1. The cradle body 200 has a cord winding portion 231 formed in side surfaces in the form of a curved-surface-like groove. The L channel unit 3 and R channel unit 4 of the headset 1 are stored in the unit storage portion 210, and a cord 2 is wound on the cord winding portion 231, so that the headset 1 can be stored compactly.

Notice

DESCRIPTION JP2012100248

PROBLEM TO BE SOLVED: To provide a cradle capable of accommodating headphones having long cords compactly without causing the cords to become tangled and also capable of charging headphones. A cradle includes a cradle main body and a cover connected to the cradle main body in an openable and closable manner. On the upper surface of the cradle main body 200, a unit housing portion 210 for housing the L channel unit 3 and the R channel unit 4 of the head set 1 is formed. A cord winding portion 231, which is a curved surface-like groove, is formed on the side surface of the cradle main body 200. By accommodating the L channel unit 3 and the R channel unit 4 of the headset 1 in the unit housing section 210 and wrapping the cord 2 around the cord winding section 231, the headset 1 can be housed compactly. (Fig.

クレードル

[0001]
TECHNICAL FIELD The present technology relates to a cradle, and in particular, to a cradle capable of housing headphones or the like having a cord.

[0002]
In recent years, when enjoying music with a music reproducing device such as an MP3 player, a portable terminal having a music reproducing function or the like, headphones having short-range wireless communication functions based on the Bluetooth (registered trademark) system, for example, are used as sound output means .

[0003]

Since headphones and portable terminals are wirelessly connected when headphones adopting the Bluetooth system are used, a code for connecting headphones and a portable terminal or the like is unnecessary, and troublesomeness due to the existence of a code can be eliminated.

However, since it is a wireless connection, headphones can not receive power supply from a portable terminal or the like.

Currently, non-contact power transmission technology called so-called wireless power and the like is proposed, but it has not yet reached a stage to be widely put into practical use. Therefore, the headphones adopting the Bluetooth system usually have a battery for supplying power to each part constituting the headphones.

[0004]
Note that headphones equipped with batteries are not limited to those employing the Bluetooth system, but also those using other wireless communication methods, and noise canceling headphones that include a DSP (Digital Signal Processor) for noise canceling.

[0005]

Since headphones equipped with these batteries can not receive power supply from a mobile terminal or the like to be connected, there is a problem that it can not be used when the battery is not charged.

Also, when carrying and carrying it, putting it in a bag, a pocket, etc. as it is may cause dust and dirt to adhere or it may be damaged.

[0006]
Therefore, a headset carry device including a protective case for housing a headset and a charger has been proposed (Patent Document 1).

[0007]

[0008]

In the headset carry device described in Patent Document 1, the headset can be housed by a protective case.

However, its composition does not consider the existence of a long code.

Therefore, even if attempting to accommodate a headset having a cord and a headphone can not be accommodated well, or even if the headset can be stored, there is a possibility that the cord is tangled in the protective case.

[0009]

Therefore, an object of the present technology is to provide a cradle which can accommodate headphones having long cords compactly without causing the cords to become tangled and can also charge the headphones.

[0010]

In order to solve the above problem, the present technology can house a headphone including a cord, a pair of headphone units provided at both ends of the cord, and a secondary battery accommodated in the headphone unit, and the cradle A cord wound portion provided on the cradle main body and around which a cord is wound; a cord winding portion provided in the cradle main body and configured to charge the secondary battery And a charging means.

[0011]

According to the present technology, headphones having cords can be housed compactly without cord entangling, and headphones can be charged without being connected to an external power source via an AC adapter or the like.

[0012]

FIG. 2 is an external view of a headset housed in a cradle according to the present technology.

FIG. 6 is an external perspective view and a six-sided view showing the appearance configuration of an L channel unit constituting a headset.

1 is an external perspective view and a six-sided view showing the appearance configuration of an R channel unit constituting a headset. FIG.

FIG. 2 is an external perspective view and a six-sided view showing the external configuration of a controller constituting a headset. FIG. 2 is a block diagram showing a configuration of a headset. 3 is an external view showing a state in which the lid of the cradle according to the present technology is opened; FIG. FIG. 5 is an external view showing a state in which the lid of the cradle is closed. FIG. 7 is an enlarged view of the periphery of the L side unit housing portion of the cradle. FIG. 5 is a side view showing a state in which the lid of the cradle functions as a stand. FIG. 2 is a block diagram showing a configuration of a cradle. FIG. 7 is a diagram for explaining a procedure of housing a headset in a cradle. FIG. 7 is a view showing a state in which a headset is stored in a cradle. 7 is an external view of a headset housed in a cradle according to a second embodiment of the present technology. FIG. 2 is an external view of an R channel unit constituting a headset. FIG. FIG. 6 is a diagram showing a state of attachment of a headset. FIG. 2 is a block diagram showing a configuration of a headset. FIG. 1 7A is an external perspective view showing a state in which the lid of the cradle according to the second embodiment of the present technology is opened, and FIG. 1 7B is an external perspective view showing a state in which the lid of the cradle is opened. FIG. 1 8A is a plan view showing the upper surface side of the cradle, and FIG. 1 8B is a plan view showing the bottom surface side of the cradle. FIG. 2 is a block diagram showing a configuration of a cradle. FIG. 6 is an external view showing a state in which a headset is stored in a cradle and a lid is open. FIG. 4 is an external view showing a state in which a headset is stored in a cradle and a lid is closed.

[001 3]

Hereinafter, embodiments of the present technology will be described with reference to the drawings. The description will be given in the following order. < 1 . First Embodiment> [1 -1 . Configuration of headset] [1 -2. Configuration of Cradle] [1 -3. Storage of headset by cradle] <2. 2. Second embodiment> [2-1 . Configuration of Headset] [2-2. Configuration of cradle] [2-3. Storage of headset with cradle] <3. Modified Example>

[0014]

< 1 . Embodiment> [1 -1 . Configuration of Headset] FIG. 1 is a diagram showing the external configuration of the headset 1 . It should be noted that the headset 1 is a headphone having a microphone for inputting sound and is assumed to be included in the headphone. The headset 1 is a so-called smartphone (not shown) which is capable of reproducing music data such as MP3 and also has a telephone function.) Or the like. Further, it is assumed that the headset 1 is a device capable of transmitting and receiving data by short-range wireless communication of the Bluetooth system. In the present embodiment, it is assumed that the headset 1 is connected to a portable terminal having a music reproduction function and a telephone function by using the Bluetooth system. The mobile terminal functions as a master of Bluetooth, and the headset 1 functions as a slave.

[0015]

When not used, the headset 1 is stored in the cradle 100 according to the present technology when charging. The headset 1 is composed of a code 2, an L channel unit 3, an R channel unit 4, and a controller 5.

[0016]

The cord 2 is internally provided with lead wires for the L channel, lead wires for the R channel, power supply wires (none of which are shown).) And the like are inserted for transmitting audio signals and supplying electric power. The code 2 is composed of a first code part 21 having a long length and a second code part 22 having a length shorter than that of the first code part 21 . An L channel unit 3 is connected to one end of the first code section 21 , and the other end is connected to one end side of the controller 5. One end side of the second code section 22 is connected to the other end of the controller 5, and the other end thereof is connected with the R channel unit 4.

[0017]

FIG. 2 is a diagram showing the configuration of the L channel unit 3. FIG. 2A is an external

perspective view, and FIGS. 2B to 2 G are six views. 2B is a front view, FIGS. 2C and 2D are side views, FIG. 2E is a top view, FIG. 2F is a bottom view, and FIG. 2G is a rear view. The L channel unit 3 includes an L side housing 31 , a sound conduit (not shown).) And an L-side earpiece 32. The L-side housing 31 is formed in a substantially circular shape in plan view, and is composed of a first L-side housing part 31 a connected to the first code part 21 and a second L-side housing part 31 b. The second L-side housing portion 31 b is formed in a substantially crescent shape as viewed from the front as one end side of the side surface is formed in a circular concave shape and the other end side of the side surface is formed in a circular convex shape. The second L-side housing part 31 b is connected to the first L-side housing part 31 a at one end side formed in a concave shape, so that the first L-side housing part 31 a with respect to the first L-side housing part 31 a 21 so as to protrude in a direction substantially perpendicular to the connection direction.

[0018]

Like the first L-side housing portion 31 a, a secondary battery 61 (not shown in FIG. 2) formed in a flat shape having a substantially circular shape in plan view is provided inside the first L-side housing portion 31 a.) Is stored in the memory. In the present embodiment, it is assumed that the flat type secondary battery 61 includes a so-called coin type battery and a button type battery. As the secondary battery 61 , for example, a lithium ion secondary battery is used. The first L side housing portion 31 a is formed in a flat shape having a substantially circular shape in plan view so as to correspond to the shape of the secondary battery 61 .

[0019]

As shown in FIG. 2G, a charge status indicator LED (Light Emitting Diode) 33 is provided on the rear side of the first L side housing part 31 a. The charging state indicator LED 33 is a notifying means for indicating to the user whether or not the secondary battery 61 is being charged by turning on or blinking. In addition, when the battery is fully charged, it is turned off to notify the user that the charging is completed.

[0020]

As shown in FIG. 2E, a small-diameter L-side hooking hole 35 is formed in the upper surface of the second L-side housing portion 31 b. The latching protrusion 21 3 of the cradle 1 00 to be

described later enters the L side latching hole 35, whereby the L channel unit 3 is held in a state of being housed in the unit accommodating portion 210 of the cradle 100.

[0021]

As shown in FIG. 2F, the power receiving terminal 34 is provided so as to be exposed from the bottom surface of the second L side housing portion 31 b. The power receiving terminal 34 is for supplying a charging current to the secondary battery 61 by contacting the power supply terminal 211 of the cradle 100 described later.

[0022]

Inside the L-side housing 31, a driver unit (not shown) including an audio processing circuit or the like is housed. A cylindrical sound conduit protrudes from the other end side of the second L side housing portion 31 b formed in a circular convex shape so as to project in a direction substantially perpendicular to the connection direction of the first cord portion 21 with respect to the first L side housing portion 31 a Has been derived. Inside the sound conduit, an L channel speaker 63 (not shown in FIG.) Is provided.

[0023]

The L-side earpiece 32 is formed in a cylindrical shape having a hole portion 32 a so as to penetrate the center. Further, it is formed so as to be constricted in the direction of the hole portion 32 a as going toward the tip. By inserting the sound conduit into the hole portion 32 a, the L-side earpiece 32 is attached to the L-side housing 31. That is, the L-side earpiece 32 is attached to the sound conduit such that the tip of the sound guide pipe is exposed from the opening of the hole 32a. Since the L-side earpiece 32 is formed using an elastic material such as silicone rubber and is freely deformable, it is possible to maintain the wearing state by being in close contact with the ear canal when it is inserted into the external auditory meatus it can. When the user inserts the L-side earpiece 32 into the ear canal of the ear, the sound conduit having the L channel speaker 63 inside is inserted into the ear canal of the user's ear via the L-side earpiece 32. As a result, the user can listen to the voice sent from the portable terminal to the headset 1.

[0024]

A charging IC 62 (not shown in FIG. 2) for controlling charging of the secondary battery 61 is provided in the L-side housing 31.) And the like are provided. Details of the internal configuration of the L-side housing 31 including those will be described later.

[0025]

FIG. 3 is a diagram showing the configuration of the R channel unit 4. FIG. 3A is an external perspective view, and FIGS. 3B to 3G are six views. 3B is a front view, FIGS. 3C and 3D are side views, FIG. 3E is a top view, FIG. 3F is a bottom view, and FIG. 3G is a rear view. The R channel unit 4 includes an R side housing 41, a sound conduit (not shown).) And an R-side earpiece 42. The R side housing 41 is formed in a substantially circular shape in plan view, and is composed of a first R side housing part 41 a and a second R side housing part 41 b connected to the second code part 22. The second R-side housing portion 41 b is formed in a substantially crescent shape when viewed from the front as one end side of the side surface is formed in a circular concave shape and the other end side is formed in a circular convex shape. The second R-side housing part 41 b is connected to the first R-side housing part 41 a at one end side formed in a concave shape, whereby the second cord 2 from the side surface of the first R-side housing part 41 a to the first R-side housing part 41 a In such a manner as to protrude in a direction substantially perpendicular to the connection direction. Like the first L side housing portion 31 a, the first R side housing portion 41 a is formed in a flat shape having a substantially circular shape in plan view.

[0026]

As shown in FIG. 3B, a circular call key 43 is provided at substantially the center of the first R side housing part 41 a when viewed from the front. The call key 43 is a button for inputting an instruction to receive a telephone call when a call is started using the telephone function of the portable terminal to which the headset 1 is connected. The call key 43 is provided so that a predetermined annular gap 44 is formed between the call key 43 and the housing of the R side housing 41.

[0027]

Inside the first R side housing part 41 a, a microphone 80 (not shown in FIG.) Is provided. The microphone 80 is configured to communicate with the outside via a gap 44 between the casing of the R side housing 41 and the call key 43. The voice of the user is input to the microphone 80 via the gap 44. As a result, the user can make a call using a so-called hands-free function.

[0028]

Further, on the front face of the second R side housing part 41 b, an operation display LED 45 is provided. The operation display LED 45 lights up or blinks to indicate that the headset 1 is powered on and the headset 1 is in an operating state.

[0029]

As shown in FIG. 3E, on the upper surface of the second R side housing part 41 b, a small diameter R side latch hole 47 is formed. The hooking protrusion 213 of the cradle 100 to be described later enters the R side latching hole 47, whereby the R channel unit 4 is held in the unit accommodating portion 210 of the cradle 100 in a state of being accommodated.

[0030]

As shown in FIG. 3F, a small diameter hole is formed in the bottom surface of the second R side housing part 41 b, and a reset key 46 is provided in the hole. This reset key 46 is a button which can be pushed by inserting, for example, a pointed fine wire in the hole, for forcibly turning off the power supply of the headset 1. In any operation, when the reset key 46 is pressed, the power supply of the headset 1 is turned off.

[0031]

Inside the R-side housing 41, there are provided a control unit 71 for controlling the entire headset 1, a Bluetooth module 77 (both not shown in FIG.) And the like are provided. Details of the inside of the housing including them will be described later.

[0032]

FIG. 4 is a diagram showing the configuration of the controller 5. FIG. 4A is an external perspective view, and FIGS. 4B to 4 G are six views. 4B is a front view, FIGS. 4C and 4D are side views, FIG. 4E is a top view, FIG. 4F is a bottom view, and FIG. 4G is a rear view. The controller 5 is an input means for performing various operation inputs to the portable terminal to which the headset 1 is connected. The controller 5 includes a volume up key 51, a volume down key 52, a PLAY / PAUSE key 53, a FF (Fast Forward) key 54, and a REW (Rewind) key 55.

[0033]

The volume up key 51 and volume down key 52 are buttons for adjusting the volume of the sound output from the headset 1. In the present embodiment, the volume up key 51 and the volume down key 52 are configured as seesaw switches integrally formed. However, they may be configured as separate buttons.

[0034]

The PLAY / PAUSE key 53 is a button for inputting playback and stop instructions of music and the like to the portable terminal to which the headset 1 is connected. In the present embodiment, the PLAY / PAUSE key 53 is configured as a single button, which is a so-called toggle button functioning as a stop button in the music reproduction state and as a reproduction button during the music stop.

[0035]

In the present embodiment, when the PLAY / PAUSE key 53 is continuously pressed for a predetermined time (for example, 7 seconds) or more, a control signal corresponding to the input operation is transmitted to the control unit 71, and the headset 1 is paired And is configured to shift to the ring mode. Pairing is a process of setting that two devices are objects of transmission and reception of data and the like between two devices. In the present embodiment, pairing is executed by exchanging both ID (identification information) and pass key (personal identification code) between the headset 1 and the portable terminal. The ID is an address that can specify

each of the headset 1 and the portable terminal, and the passkey functions only when it is the same as the secret code set between the two devices.

[0036]

The FF key 54 is a button for performing a music feed such as a music piece reproduced by the mobile terminal. The REW key 55 is a button for performing a music return such as a music piece reproduced by the mobile terminal. In the present embodiment, the FF key 54 and the REW key 55 are integrated with the PLAY / PAUSE key 53. That is, the PLAY / PAUSE key 53 functions as a PLAY / PAUSE key by being depressed, and functions as the FF key 54 or the REW key 55 according to the sliding direction by sliding in the horizontal direction.

[0037]

FIG. 5 is a block diagram showing a configuration of the headset 1 including the L channel unit 3, the R channel unit 4, and the controller 5.

[0038]

The L channel unit 3 includes a secondary battery 61 , a power receiving terminal 34, a charging IC 62, a charging state display LED 33, and an L channel speaker 63.

As described above, the secondary battery 61 is, for example, a flat type lithium ion secondary battery 61 . Power is supplied from the secondary battery 61 to the L channel unit 3, the R channel unit 4, and the controller 5. The L channel unit 3, the R channel unit 4, and the controller 5 are connected to a power supply line (not shown) inserted through the cord 2.).

[0039]

The power receiving terminal 34 is connected to the charging IC 62 and supplies current to the secondary battery 61 via the charging IC 62 by contacting the power feeding terminal 211 of the cradle 100 described later. The charging IC 62 controls charging so that the secondary battery 61 is charged based on a predetermined charging method such as constant current constant voltage charging. The charging state display LED 33 is a notification means for indicating to the

user whether or not the secondary battery 61 is being charged by turning on or blinking under the control of the charging IC 62. The charging IC 62 monitors the amount of charge of the secondary battery 61 and performs control so that the charging state display LED 33 is turned off when the secondary battery 61 is fully charged. In this way, it is possible to notify the user that the charging is completed.

[0040]

The R channel unit 4 includes a control unit 71, a bus 72, a RAM 73 (Random Access Memory), a ROM 74 (Read Only Memory), a serial I / O interface 75, and a parallel I / O interface 76. It also includes a Bluetooth module 77, an antenna 78, an R channel speaker 79, and a microphone 80. Furthermore, it has a call key 43, an action display LED 45, and a reset key 46.

[0041]

The control unit 71 is, for example, a CPU (Central Processing Unit) that performs predetermined processing. The RAM 73 is used as a work memory of the control unit 71. In the ROM 74, programs and the like read and operated by the control unit 71 are stored. The control unit 71 is connected to the RAM 73 and the ROM 74 via a bus 72, and executes various processes according to a program stored in the ROM 74 to issue commands to control the entire headset 1.

[0042]

The serial I / O interface 75 is connected to the control unit 71 via a bus 72. A Bluetooth module 77 is connected to the serial I / O interface 75. The Bluetooth module 77 is a module capable of sending and receiving data by the Bluetooth short-range wireless communication. The Bluetooth module 77 exchanges data with a portable terminal which is an external Bluetooth device as a master. In the present embodiment, the mobile terminal functions as a master of Bluetooth, and the headset 1 functions as a slave.

[0043]

To the Bluetooth module 77, an antenna 78, an R channel speaker 79, a microphone 80, and an L

channel speaker 63 are connected. Note that the L channel speaker 63 is an audio output means in the L channel unit 3 and the R channel speaker 79 is a voice output means in the R channel unit 4. The Bluetooth module 77 and the L channel speaker 63 are connected by a cord 2.

[0044]

When receiving audio data from a portable terminal which is an external Bluetooth device, the Bluetooth module 77 receives the audio data transmitted from the mobile terminal via the antenna 78 and supplies it to the built-in signal processing unit. Then, the signal processing unit performs predetermined signal processing on the audio data to generate an audio signal, and supplies it to the L channel speaker 63 and the R channel speaker 79. As a result, the music reproduced by the mobile terminal from the L channel speaker 63 and the R channel speaker 79 is output as sound.

[0045]

When receiving a call using the telephone function of the portable terminal, the Bluetooth module 77 receives the received voice data transmitted from the portable terminal by the antenna 78 and supplies the received voice data to the built-in signal processing unit. Then, the signal processing unit performs predetermined signal processing on the audio data to generate an audio signal, and supplies it to the L channel speaker 63 and the R channel speaker 79. As a result, received voice is output from the L channel speaker 63 and the R channel speaker 79.

[0046]

Further, when sending a voice using the telephone function of the portable terminal, the microphone 80 acquires voice such as a user's voice and converts it into a voice signal. The audio signal is supplied to the Bluetooth module 77. In the built-in signal processing unit, the Bluetooth module 77 performs predetermined signal processing on the audio signal supplied from the microphone 80 to generate audio data. The generated audio data is transmitted to the mobile terminal which is an external Bluetooth device via the antenna 78. In this manner, the user can talk using the headset 1 and the portable terminal.

[0047]

A call key 43 and a reset key 46 are connected to the parallel I / O interface 76. As described above, the call key 43 is a button for inputting an instruction to receive a telephone call. The reset key 46 is a button for forcibly turning off the power supply of the headset 1. When an input (for example, pressing) is performed on the button by the user, a control signal corresponding to the input is generated, and the control signal is output to the control unit 71 via the parallel I / O interface 76 and the bus 72. Then, processing corresponding to the control signal is performed by the control unit 71, whereby operations corresponding to various buttons are performed.

[0048]

An operation display LED 45 is connected to the parallel I / O interface 76. As described above, the operation display LED 45 lights up or blinks under the control of the control unit 71, thereby indicating that the power of the headset 1 is ON and the headset 1 is in the operating state.

[0049]

Further, a volume up key 51, a volume down key 52, a PLAY / PAUSE key 53, an FF key 54 and a REW key 55 provided in the controller 5 are connected to the parallel I / O interface 76. These various keys and the parallel I / O interface 76 are connected by a code 2. When an input to these various keys is made by the user, a control signal corresponding to the input is output to the control unit 71 via the parallel I / O interface 76 and the bus 72. Then, processing corresponding to the control signal is performed by the control unit 71, whereby operations corresponding to the various keys are performed.

[0050]

[1-2. Configuration of Cradle] Next, the configuration of the cradle 100 that houses the headset 1 will be described. 6 and 7 are diagrams showing the external configuration of the cradle 100. FIG. 8 is an enlarged view of the periphery of the L-side housing housing portion 210 a. The cradle 100 is composed of a cradle main body 200 and a lid 300, and a lid 300 is connected to the cradle main body 200 so as to be opened and closed by a hinge 400. FIG. 6 is a view showing a state in which the cradle 100 is open. 6A is a top view, FIG. 6B is a bottom view,

and FIGS. 6C and 6D are side views. FIG. 7 is a six-sided view showing a state in which the cradle 100 is closed. 7A is a top view, FIGS. 7B and 7C are side views, FIG. 7D is a front view, FIG. 7E is a rear view, and FIG. 7F is a bottom view.

[0051]

The cradle main body 200 is made of a synthetic resin such as plastic, for example, and plays a role of housing the head set 1. On the upper surface of the cradle main body 200, a unit housing portion 210 for housing the L channel unit 3 and the R channel unit 4 of the head set 1 is formed.

[0052]

The unit housing portion 210 has an L-side housing housing portion 210 a for housing the L-channel unit 3 of the headset 1 and an R-side housing housing portion 210 b for housing the R-channel unit 4. Further, the unit housing section 210 has an earpiece housing section 210 c for housing the earpieces constituting the L channel unit 3 and the R channel unit 4.

[0053]

The L-side housing housing section 210 a and the R-side housing housing section 210 b are connected to the left side of the upper surface of the cradle 100 so that the L-side housing 31 and the R-side housing 41 constituting the L-channel unit 3 and the R-channel unit 4 can be fitted And on the right side. The L-side housing accommodating portion 210 a and the R-side housing accommodating portion 210 b are formed in a groove shape curved at the side so as to conform to the shape of the housing.

[0054]

The earpiece storage portion 210 c is provided substantially at the center of the upper surface of the cradle main body 200 and between the L-side housing storage portion 210 a and the R-side housing storage portion 210 b. The earpiece storage portion 210 c is formed in a concave shape having a substantially circular shape in a plan view having a sufficient depth and width so as to

be able to collectively accommodate the L-side earpiece 32 and the R-side earpiece 42. The earpiece housing portion 210 c is formed to be connected to the L-side housing storage portion 210 a and the R-side housing storage portion 210 b. This makes it possible to accommodate the L channel unit 3 and the R channel unit 4 including the housing and the earpiece.

[0055]

As shown in FIG. 8, the power supply terminal 211 is provided so as to protrude from the side surface of the L side housing housing portion 210 a. The power supply terminal 211 is provided at a position corresponding to the power reception terminal 34 in a state where the L side housing 31 is housed in the L side housing storage portion 210 a. By accommodating the L-side housing 31 in the L-side housing accommodating portion 210 a, the power receiving terminal 34 and the power supply terminal 211 are brought into contact with each other, and the charging current is supplied to the head set 1.

[0056]

On the bottom surface of the L-side housing housing portion 210 a, a protruding unit detection switch 212 is provided so as to protrude upward. The unit detection switch 212 always protrudes from the bottom surface of the L side housing storage portion 210a and is pressed by fitting the housing into the L side housing storage portion 210a. Therefore, the unit detection switch 212 detects that the headset 1 is stored in the cradle 100 by being pressed when the headset 1 is stored in the cradle 100. The unit detection switch 212 corresponds to the storage detection means in the claims.

[0057]

The unit detection switch 212 is connected to a charge on / off switching unit 510 provided inside the cradle 100, and functions as a charge changeover switch for operating the charge on / off switching unit 510 when pressed. As described above, since the unit detection switch 212 is concerned with charging the headset 1, the unit detection switch 212 may be provided in the L-side housing storage section 210 a in which the L-side housing storage section 210 a accommodating the secondary battery 61 is stored . The details of the switching of charging by the charge on / off switching unit 510 will be described later.

[0058]

Further, a locking projection 213 is provided so as to protrude from the side surface of the L-side housing storage portion 210 a. The latching protrusion 213 enters the L side latching hole 35 provided in the second L side housing portion 31 b of the L channel unit 3 so as to hook the L channel unit 3 in a fitted state. Similarly to the L-side housing accommodating portion 210 a, the R-side housing accommodating portion 210 b is also provided with hooking projections of a similar configuration. Thereby, it is possible to prevent the L channel unit 3 and the R channel unit 4 from accidentally coming off the cradle 100.

[0059]

On the upper surface of the cradle 100, a charging state display LED 214 is provided. The charging state indicator LED 214 lights up or blinks to indicate that the battery 507 provided in the cradle 100 is in a charged state.

[0060]

A USB (Universal Serial Bus) terminal 221 is provided on the bottom surface of the cradle 100. The USB terminal 221 is for connecting the cradle 100 to an outlet for supplying commercial power or an external power source such as a personal computer for charging the battery 507 provided inside the cradle 100.

[0061]

A battery remaining amount display section 222 is provided on the bottom surface of the cradle 100. The battery remaining amount display section 222 is composed of a first remaining amount display LED 222 a, a second remaining amount display LED 222 b and a third remaining amount display LED 222 c aligned in a line, and each LED indicates the remaining amount of the battery of the cradle 100 . In the present embodiment, the first remaining amount display LED 222 a positioned on the left side among the three remaining amount display LEDs indicates the largest amount of charge, and the third remaining amount display LED 222 c located on the right side indicates the smallest charge amount It is shown that. And the second remaining amount display

LED 222 b at the center indicates the intermediate charge amount.

[0062]

It should be noted that the third remaining amount display LED 222 c indicating that the charge amount is small may be lit in red to warn the user that the charge amount is small. Then, in order to indicate that the first remaining amount display LED 222 a and the second remaining amount display LED 222 b are sufficiently charged and there is no problem in using the cradle 100, if it is made to light up in a color different from red, for example, green Good. However, the configuration of the battery remaining amount display section 222 is not limited to this, and it may be configured with more LEDs, and the color to be lighted is not limited to green or red.

[0063]

The remaining amount display switch 223 is a switch for turning on the battery remaining amount display section 222. In the present embodiment, the battery remaining amount display section 222 is not normally turned on, and is configured so as to light up only when an input is made to the remaining amount display switch 223. By configuring in this way, it is possible to suppress the consumption of the battery 507 by turning on only when the user wishes to confirm the remaining amount of the battery without turning on the battery remaining amount display section 222 at all times. It should be noted that the battery remaining amount display section 222 should be automatically turned off after a predetermined time (for example, 2 to 3 seconds) has elapsed since the input to the remaining amount display switch 223 was made and turned on.

[0064]

A recess portion 224 is formed on the bottom surface of the cradle 100. As will be described in detail later, the recessed portion 224 is for abutting against the abutting portion 303 of the lid 300 when the lid 300 is opened and functions as a stand for erecting the cradle main body 200.

[0065]

On the side surface of the cradle main body 200, a cord winding portion 231 is formed around the entire circumference. The cord winding portion 231 is a curved surface shaped groove formed over the entire side surface of the cradle main body 200. The cord 2 is stored by being wound around this groove.

[0066]

The side surface of the cradle main body 200 in the connection position direction with the lid 300 functions as a cord winding portion 231 and also functions as a controller storage portion 232 for accommodating the controller 5 of the head set 1. In the present technology, when the cord 2 is wrapped around the cord winding portion 231, the length of the cord 2 and the mounting position of the controller 5 are adjusted so that the controller 5 is positioned in the controller accommodating portion 232.

[0067]

The lid 300 covers the upper surface of the cradle main body 200 in a closed state and is connected to the cradle main body 200 so as to be rotatable via a hinge 400. As shown in FIG. 9, the lid 300 also functions as a stand for supporting the cradle main body 200 in a standing state in a state where the cradle main body 200 stands up.

[0068]

An earpiece cover portion 302 is provided on the lid 300. The earpiece cover portion 302 is provided at a position facing the earpiece of the lid 300 so that the earpiece of the headset 1 accommodated in the cradle main body 200 does not contact the inner surface of the lid 300 in a state where the lid 300 is closed. Accordingly, the earpiece cover portion 302 is formed in a convex shape on the outer surface of the lid 300, and is formed in a concave shape on the inner surface of the lid 300.

[0069]

Further, the outer curved surface of the lid 300 on the connection side with the hinge 400

functions as the abutment portion 303. The abutting portion 303 abuts against the depressed portion 224 of the cradle main body 200 in order to support the cradle main body 200 in a standing state. Therefore, the abutting portion 303 is configured to have a shape corresponding to the depressed portion 224 so as to precisely abut the depressed portion 224.

[0070]

In order to raise the cradle main body 200, the lid 300 is rotated until the outer surface of the lid 300 comes into contact with the bottom surface of the cradle main body 200 as shown in FIG. 9B from the state in which the lid 300 shown in FIG. 9A is closed. Then, the abutting portion 303 of the lid 300 abuts against the depressed portion 224 formed on the bottom surface of the cradle main body 200, and the cradle main body 200 is placed on the lid 300. As a result, the lid 300 functions as a stand and can support the cradle main body 200 in a stable state. When the lid 300 functions as a stand, the hinge 400 and the distal end 301 of the lid 300 come into contact with the placement surface of a desk or the like and stand upright.

[0071]

FIG. 10 is a block diagram showing the configuration of the cradle 100. The cradle 100 includes a control unit 501, a bus 502, a RAM 503, a ROM 504, a USB terminal 221, and a USB interface 506. Further, it has a parallel I / O interface 505, a battery 507, a charging IC 508, a charging state display LED 214, a battery remaining amount display section 222, and a remaining amount display switch 223. Furthermore, it includes a charging path switching unit 509, a charge on / off switching unit 510, a unit detection switch 212, a DC / DC converter 511, and a power supply terminal 211.

[0072]

The control unit 501 is, for example, a CPU that performs predetermined processing. The RAM 503 is used as a work memory of the control unit 501. In the ROM 504, programs and the like which are read and operated by the control unit 501 are stored. The control unit 501 is connected to the RAM 503 and the ROM 504 via the bus 502, performs various processes according to a program stored in the ROM 504, and issues a command to control the entire cradle 100.

[0073]

The USB terminal 221 is a connecting means for connecting the cradle 100 to an outlet for supplying power from a commercial power source or an external power source such as a personal computer. A charging current is supplied from an external power supply through the USB terminal 221. It should be noted that it is not always necessary to use the USB standard for connecting to the external power supply, and the cradle 100 may be connected to the outlet via the AC adapter.

[0074]

The USB interface 506 is connected to the USB terminal 221 and is also connected to the control unit 501 via the bus 502. The control unit 501 reads the control pulse included in the voltage and voltage supplied from the USB terminal 221 via the USB interface 506 and determines the amount of charging current that can be obtained from the connected external power supply.

[0075]

The battery 507 is, for example, a rechargeable lithium ion secondary battery, and supplies power to the entire cradle 100 and also serves as a charging charge for the secondary battery 61 of the headset 1. Therefore, when the battery 507 is fully charged, it is preferable to use a battery having a sufficient battery capacity so that the secondary battery 61 of the headset 1 can be charged a plurality of times. When the USB terminal 221 is normally connected to an external power supply, the cradle 100 operates with electric power from the external power supply, and the battery 507 is not used. That is, the battery 507 supplies power to the entire cradle 100 when the USB terminal 221 is not connected to the external power supply.

[0076]

The charging IC 508 is connected to the control unit 501 via the parallel I / O interface 505. It is also connected to the USB terminal 221 and the battery 507. The charging current supplied from the USB terminal 221 is supplied to the battery 507 via the charging IC 508. The charging IC 508 controls the charging so that the battery 507 is charged based on a predetermined charging

method such as constant current constant voltage charging, for example. In addition, the charging IC 508 is also connected to the charging state display LED 21 4, and also controls the charging state display LED 21 4 to light up when the battery 507 is being charged.

[0077]

The battery remaining amount display section 222 includes a first remaining amount display LED 222 a, a first comparator 222 d, a second remaining amount display LED 222 b, a second comparator 222 e, a third remaining amount display LED 222 c, and a third comparator 222 f. The first comparator 222 d and the first remaining amount display LED 222 a, the second comparator 222 e and the second remaining amount display LED 222 b, the third comparator 222 f and the third remaining amount display LED 222 c correspond to each other. The battery remaining amount display section 222 is connected to the battery 507 via a remaining amount display switch 223.

[0078]

Different threshold values are set for the first comparator 222 d, the second comparator 222 e, and the third comparator 222 f, respectively, and the remaining amount of the battery 507 is compared with the threshold value. Then, when the remaining amount of the battery 507 is equal to or more than the threshold value, a predetermined signal is transmitted so that the corresponding remaining amount indication LED is turned on. In the present embodiment, the threshold value of the first comparator 222 d is set to the largest value, the threshold value of the second comparator 222 e is subsequently set to a value smaller than the threshold value of the first comparator 222 d, and the third The threshold value of the comparator 222 f is set to the smallest value.

[0079]

For example, when the remaining amount of the battery 507 is equal to or higher than the threshold value of the third comparator 222 f but is equal to or lower than the threshold value of the second comparator 222 e and the first comparator 222 d, only the third remaining amount display LED 222 c is lit . If the remaining amount of the battery 507 is greater than or equal to the threshold values of all of the first comparator 222 d, the second comparator 222 e, and the third comparator 222 f, the first remaining amount display LED 222 a, the second remaining

amount display LED 222 b, All of the LEDs 222 c are turned on.

[0080]

The battery remaining amount display section 222 is connected to the battery 507 via the remaining amount display switch 223 as described above. As described above, the remaining amount display switch 223 is provided on the bottom surface of the cradle main body 200 of the cradle 100, and is turned on when the user presses it to connect the battery 507 and the remaining amount display LED. As a result, the comparison by the comparator and the lighting of the battery remaining amount display section 222 are performed only when the remaining amount display switch 223 is pressed.

[0081]
The power supply terminal 211 is for supplying a charging current to the headset 1 by coming into contact with the power receiving terminal 34 of the headset 1.

[0082]

The charging path switching unit 509 is configured as a switch circuit including two switches, a first changeover switch 509 a and a second changeover switch 509 b.

One end of the first changeover switch 509 a is connected to the USB terminal 221, and the other end is connected to the charge on / off changeover section 510. Further, one end of the second changeover switch 509 b is connected to the battery 507, and the other end is connected to the charge on / off changeover section 510. Furthermore, the charging path switching unit 509 is connected to the control unit 501 via the parallel I / O interface 505, and switching is performed between the first changeover switch 509 a and the second changeover switch 509 b under the control of the control unit 501.

[0083]

The charging path switching unit 509 switches charging of the headset 1 via the power supply terminal 211 with charging current supplied from the USB terminal 221 or by charging current

from the battery 507. The first changeover switch 509 a corresponds to charging by the external power source connected by the USB terminal 221 and the second changeover switch 509 b corresponds to charging by the battery 507.

[0084]
Note that the charging performed by the external power supply via the USB terminal 221 is the first charging means in the claims and the charging performed using the battery 507 provided in the cradle 100 is the charging 2 of the present invention.

[0085]

In the present embodiment, when recognizing that the USB terminal 221 is connected to the external power supply via the USB interface 506, the control unit 501 turns on the first changeover switch 509 a and the second changeover switch 509 b Is turned off.

As a result, the battery 507 of the headset 1 is charged by the charging current supplied from the USB terminal 221. On the other hand, when recognizing that the USB terminal 221 is not connected to the external power supply, since the headset 1 is charged by the battery 507 of the cradle 100, the first changeover switch 509 a is turned off and the second changeover switch 509 b is turned on Control is performed.

[0086]

When the battery 507 is being charged by the external power supply via the USB terminal 221, the control unit 501 switches the first changeover switch 509 a and the second changeover switch 509 b together so as not to charge the headset 1 And turns it off. However, the operation of the charging path switching unit 509 is not limited to such an example. For example, when the battery 507 is being charged by the external power supply via the USB terminal 221, the headset 1 may be charged at the same time by turning on the first changeover switch 509 a.

[0087]

The charge on / off switching unit 510 is configured as a switch circuit including two switches, a

first on / off switch 510 a and a second on / off switch 510 b. One end of the first on / off switch 510 a is connected to the other end of the first changeover switch 509 a of the charge path switching section 509, and the other end of the first on / off switch 510 a is connected to the power supply terminal 211. One end of the second on / off switch 510 b is connected to the other end of the second changeover switch 509 b of the charge path switching section 509, and the other end of the second on / off switch 510 b is connected to the DC / DC converter 511.

[0088]

The charge on / off switching unit 510 is further connected to the unit detection switch 212. As described above, the unit detection switch 212 is a protrusion switch provided on the bottom surface of the L-side housing storage portion 210 a of the cradle 100. The first on / off switch 510a and the second on / off switch 510b of the charging on / off switching unit 510 are both normally in an off state. When the headset 1 is housed in the cradle 100 and the unit detection switch 212 is turned on, in conjunction therewith And is configured to be turned on. When the head set 1 is detached from the cradle 100 and the unit detection switch 212 is turned off, the first switch and the second switch are turned off in conjunction with the removal. As a result, when the headset 1 is stored in the cradle 100, the headset 1 is automatically charged.

[0089]

The DC / DC converter 511 is a step-up circuit, one end of which is connected to the other end of the second on / off switch 510 b of the charge on / off switching section 510, and the other end is connected to the power supply terminal 211. In order to allow the battery 507 of the headset 1 to be charged with electric power supplied from the battery 507, the voltage is boosted to a specified voltage by the DC / DC converter 511. The power boosted to the specified voltage by the DC / DC converter 511 is sent to the battery 507 of the headset 1 via the power supply terminal 211. In this manner, charging of the headset 1 using the battery 507 of the cradle 100 is performed.

[0090]

[1 — 3. Storing the headset with the cradle] The cradle 100 is constituted as described above. Next, a case where the headset 1 is housed in the cradle 100 will be described with reference to FIG. 11. When storing the headset 1 in the cradle 100, one of the L channel unit 3 or the R

channel unit 4 constituting the head set 1 is first fitted into the unit housing section 210 and stored. In FIG. 11, first, the L channel unit 3 is housed in the unit housing section 210. However, it is also possible to store the R channel unit 4 first. When the L channel unit 3 is fitted in the unit housing part 210, the locking projection 213 enters the L side locking hole 35. This prevents the L channel unit 3 from accidentally coming off the unit storage section 210.

[0091]

In the present embodiment, since the unit detection switch 212 is provided on the bottom surface of the L-side housing storage portion 210 a, when the L-channel unit 3 is fitted, the unit detection switch 212 is turned on. As a result, the charge on / off switching section 510 is turned on, and charging of the secondary battery 61 of the headset 1 is started.

[0092]

In the present technology, the L channel unit 3 is housed in the unit housing section 210 such that the charge state display LED 33 provided in the L side housing 31 is exposed to the upper surface side. As a result, the user can visually recognize the charge state display LED 33 of the headset 1 and the charge state display LED 214 provided in the cradle main body 200 at the same time. Therefore, the user can easily grasp the state of charging, such as which of the headset 1 and the cradle 100 is being charged.

[0093]

Next, the cord 2 is wound around the cord winding portion 231 formed over the entire circumference of the side surface of the cradle main body 200. In FIG. 11, the cord 2 is wrapped around the cord winding portion 231 in a counterclockwise direction. Since it is unnecessary to change the cradle 100 when winding the cord 2 on the cord winding portion 231, it is possible to easily wind the cord 2. Since the cord winding portion 231 is a groove formed in a curved surface shape, the cord 2 is caught on the edge of the groove once wound, so that the cord 2 will not accidentally come off the cradle 100.

[0094]

Then, after winding the cord 2 around the cord winding portion 231, the R channel unit 4 is fitted into the unit housing portion 210 and accommodated therein. Similarly to the L channel unit 3, when the R channel unit 4 is also fitted into the unit housing section 210, the locking projection enters the R side latching hole 47. This prevents the R channel unit 4 from being inadvertently removed from the unit housing section 210.

[0095]

The length of the cord 2 is set to be the same as the length of the entire circumference of the cord winding portion 231 so as to prevent slack when the L channel unit 3 and the R channel unit 4 are stored and the cord 2 is wrapped around the cord winding portion 231 As shown in FIG. As a result, the code 2 does not slack out of the cradle 100, and the code 2 does not become an obstacle.

[0096]

Further, in the present technology, when the cord 2 is wrapped around the cord winding portion 231, the controller 5 of the head set 1 is configured to be accommodated in the controller accommodating portion 232 located near the hinge 400. Thereby, when the lid 300 is closed after accommodating the headset 1, the controller 5 is covered by the lid 300. As a result, it is possible to prevent dust and dirt from adhering to the controller 5, damage of the controller 5 due to shock, and the like.

[0097]

FIG. 12 is a view showing a state in which the headset 1 is accommodated in the cradle 100. FIG. 12A shows a state in which the lid 300 functions as a stand. The hinge 400 and the tip end 301 of the lid 300 are in contact with a placement surface such as a desk, and the lid 300 supports the cradle main body 200 in a standing state. As a result, the user can stand the cradle 100 at a desired place.

[0098]

FIG. 12B shows a state in which the lid 300 is closed. As shown in FIG. 12B, when the lid 300 is closed, the L channel unit 3 and the R channel unit 4 stored in the unit housing section 210 are covered by the lid 300. Thereby, it is possible to prevent dust and dirt from adhering to the L channel unit 3 and the R channel unit 4. Furthermore, it is also possible to prevent the L channel unit 3 and the R channel unit 4 from being damaged.

[0099]

Furthermore, in a state in which the lid 300 is closed, the controller 5 of the headset 1 is also covered by the lid 300. Therefore, it is possible to prevent dust and dirt from adhering to the controller 5, and to prevent breakage of the controller 5. Further, the button of the controller 5 is not erroneously pressed down. Therefore, the user can store the headset 1 in the cradle 100 and put it in a bag or the like and carry it easily. Generally, if Headset 1 is placed in a bag or pocket as it is, Code 2 will become entangled. However, in the present technology, since the cord 2 is stored by being wrapped around the cord winding portion 231, the cord 2 will not be entangled even if it is put in a bag or the like. Therefore, by accommodating the headset 1 in the cradle 100, the headset 1 is not damaged or the cord 2 is entangled, so that the headset 1 can be easily carried in a safe manner in a bag or the like.

[0100]

In the present technology, since the secondary battery 61 of the headset 1 can be charged with the electric power from the battery 507 of the cradle 100, the headset 1 can be charged without being connected to an AC adapter or a personal computer . Therefore, it is possible to charge the headset 1 even on the go. Furthermore, since the headset 1 is charged during carrying, it is possible to avoid situations where the remaining capacity of the battery is insufficient and the headset 1 can not be used.

[0101]

A planar secondary battery 61 housed in the housing of the headset 1 and having a substantially circular shape in plan view has a thickness direction substantially perpendicular to the direction in which the L-side earpiece 32 is connected to the first L-side housing portion 31 a And is housed in the first L side housing 31 a. That is, the secondary battery 61 is housed so that the

thickness direction is substantially perpendicular to the insertion direction into the ear. The first L-side housing portion 31 a is formed in a flat shape having a substantially circular shape in plan view so as to correspond to the secondary battery 61. As a result, when the L-side earpiece 32 is inserted into the ear, a part of the circular arc of the first L-side housing portion 31 a faces in the ear direction. As a result, the stability of the L channel unit 3 is increased, and a comfortable wearing feeling can be obtained. Since the R channel unit 4 is also formed in the same shape as the L channel unit 3, the same effect can be obtained.

[0102]

Further, the thickness direction of the secondary battery 61 is not substantially parallel to the direction in which the L-side earpiece 32 is connected to the first L-side housing portion 31 a but is stored in the first L-side housing portion 31 a so as to be substantially vertical Has been done. As a result, the first L side housing part 31 a can be formed thinner than the L side earpiece 32 (the side face of the L side housing 31 does not protrude from the width of the L side earpiece 32). Therefore, it is possible to make the depth of the unit housing portion 210 shallow and contribute to the thinning of the cradle 100.

[0103]

< 2. 2. Second embodiment> [2-1. Configuration of Headset] Next, a second embodiment of the present technology will be described. FIG. 13 is a diagram showing an external configuration of a headset 1000 housed in a cradle 2000 according to the second embodiment. As in the first embodiment, the headset 1000 is assumed to be a device capable of sending and receiving data by the Bluetooth short-range wireless communication. Further, it is assumed that the headset 1000 is connected to a portable terminal having a music reproduction function and a telephone function by using the Bluetooth method. In that case, the mobile terminal functions as a master of Bluetooth, and the headset 1000 functions as a slave.

[0104]

The headset 1000 is stored in the cradle 2000 when not using or charging. The headset 1000 includes a cord 1100, an R side hanger 1200, an R channel unit 1300, an L side hanger 1400, an L channel unit 1500, and a controller 1600.

[01 05]

The cord 1 1 00 internally contains an L-channel conductor, an R-channel conductor, a power supply line (none of which are shown).) And the like are inserted for transmitting audio signals and supplying electric power. An R side hanger 1 200 is provided at one end of the cord 1 1 00 and an L side hanger 1 400 is provided at the other end of the cord 1 1 00. The R-side hanger 1 200 and the L-side hanger 1 400 support the headset 1 000 in a stable state when the user is caught by the ear when the user wears the headset 1 000. The R-side hanger 1 200 and the L-side hanger 1 400 have some degree of flexibility so that the shape can be adjusted according to the shape of the ear, and, for example, rubber or the like is used to provide a certain degree of rigidity for supporting the headset 1 000 .

[01 06]

An R channel unit 1 300 is connected to the tip of the R side hanger 1 200. Likewise, an L channel unit 1 500 is connected to the tip of the L side hanger 1 400. Similarly to the cord 1 1 00, L-channel conductors, R channel conductors, power supply lines, etc. are inserted in the R-side hanger 1 200 and the L-side hanger 1 400. This enables transmission and power supply of the audio signal via the code 1 1 00 and the R side hanger 1 200 and the L side hanger 1 400. Further, the code 1 1 00 is provided with a controller 1 600. The controller 1 600 is an input means for performing various operations on the portable terminal to which the headset 1 000 is connected.

[01 07]

FIG. 1 4 is a diagram showing the configuration of the R channel unit 1 300. FIG. 1 4A is an external perspective view of the R channel unit 1 300, and FIGS. 1 4B to 1 4 G are six views. 1 4B, 1 4C, 1 4D and 1 4G are side views, FIG. 1 4E is a top view, and FIG. 1 4F is a bottom view. The R channel unit 1 300 includes an R side housing 1 31 0, an R side driver storage section 1 320, a sound conduit and an R side earpiece 1 330.

[01 08]

The R-side housing 1 31 0 is formed in a substantially rectangular parallelepiped shape. The R

side housing 1 31 0 is for housing a head set operation circuit, a module for Bluetooth communication, and the like. The configuration inside the R side housing 1 31 0 will be described later.

[01 09]

The R side driver housing portion 1 320 is provided so as to protrude in the lateral direction from one end side of the R side housing 1 31 0. As a result, the R channel unit 1 300 has a substantially L shape. A driver unit (not shown) for outputting voice is provided in the R side driver storage unit 1 320.) Is stored in the memory. Also, a sound conduit is led to the outside from the tip of the driver housing portion. Inside the sound conduit, an R channel speaker (not shown in FIG.) Is provided. Similarly to the first embodiment, the R-side earpiece 1 330 is formed in a tubular shape having a hole 1 331 at substantially the center, and is formed so as to be narrowed toward the hole portion 1 331 toward the distal end. An R-side earpiece 1 330 is attached by inserting a sound conduit into the hole portion 1 331 .

[01 1 0]

As shown in FIG. 1 4B, a power receiving terminal 1 31 1 is provided on a side surface of the R side housing 1 31 0. The power receiving terminal 1 31 1 supplies charging current to the secondary battery 61 included in the headset 1 000 by being in contact with a power supply terminal 3300 included in a cradle 2000 described later.

[01 1 1]

Further, as shown in FIG. 1 4B, a small diameter hole is formed in the side surface of the R side housing 1 31 0, and a reset key 1 31 2 is provided in the hole. This reset key 1 31 2 is a button that can be pushed by inserting, for example, a pointed fine wire in the hole, for forcibly turning off the power supply of the headset 1 000. Even during any operation, when the reset key 1 31 2 is pressed, the power supply of the headset 1 000 is turned off.

[01 1 2]

Further, as shown in FIG. 14C, a status display LED 1313 is provided on the side surface of the R side housing 1310. The status display LED 1313 is a notification means for indicating to the user whether or not the secondary battery 61 is being charged by turning on or blinking. In addition, when the battery is fully charged, it is turned off to notify the user that the charging is completed. Further, by turning on or blinking, the status display LED 1313 may indicate that the power of the headset 1000 is on and that the headset 1000 is in the operating state.

[0113]

Further, as shown in FIG. 14F, a function key 1314 is provided on the bottom surface of the R side housing 1310. The function key 1314 is an input means used for inputting, for example, a pairing execution instruction for BlueTooth communication, switching on / off of the power supply of the headset 1000, receiving instruction or the like.

[0114]

For example, the function key 1314 can issue a different type of operation instruction depending on the pressed time. For example, when the function key 1314 is kept pressed for several seconds (for example, 2 seconds) while the headset 1000 is powered off, the headset 1000 is powered on. Also, when the power of the headset 1000 is off, pressing the function key 1314 for a longer number of seconds (for example, 7 seconds) than the power on input enters the pairing mode. Further, when the mobile terminal connected to the headset 1000 is receiving an incoming call, the user can receive a telephone by pressing the function key 1314 for a short time.

[0115]

In this way, when an input is made to the function key 1314, a control signal different according to the pressed time or the like is transmitted to the control unit in the headset 1000 and controlled by a control unit provided in the headset 1000 Control of the headset 1000 according to the signal is performed. However, the operation method of the above-described function key 1314 is merely an example, and it is not limited thereto. Different types of inputs may be made depending on not only the pressed time but also the pressed number of times. In addition, a plurality of function keys may be provided in the R side housing 1310 instead of just one.

[0116]

Further, as shown in FIG. 14G, the R side housing 1310 is provided with a talking microphone 1315. As a result, the user can make a call using a so-called hands-free function.

[0117]

Like the above-described R channel unit 1300, the L channel unit 1500 includes an L side housing, an L side driver storage section, and an L side earpiece. However, the power receiving terminal 1311, the reset key 1312, the status display LED 1313, and the microphone 1315 are not provided in the L channel unit 1300.

[0118]

A rectangular parallelepiped secondary battery 61 is accommodated in the L-side housing 1510. As the secondary battery 61, for example, a lithium ion secondary battery 61 is used. By using the rectangular parallelepiped secondary battery 61 and forming the L side housing 1510 in a rectangular shape, the width of the housing can be made smaller than in the case of using a round battery.

[0119]

Inside the L-side housing 1510, a charging IC 62 (not shown in FIG. 14) for controlling charging of the secondary battery 61 is provided.) Is provided. Details of the structure inside the L side housing including them will be described later.

[0120]

Note that the power receiving terminal 1311, the reset key 1312, the status display LED 1313, and the microphone 1315 are not necessarily provided in the R side housing 1310. Also, the secondary battery 61 does not necessarily need to be built in the L-side housing 1510. All of the

power reception terminal 1311, the reset key 1312, the charge state display LED 1313, the function key 1314, and the microphone 1315 may be provided in the L side housing 1510 and the secondary battery 61 may be built in the R side housing 1310. In addition, the secondary battery 61 may be built in the L-side housing 1510 and the power receiving terminal 1311 and the status display LED 1313 may be provided in the L-side housing 1510.

[0121]

The controller 1600 is an input means for performing various operation inputs to the portable terminal to which the headset 1000 is connected. For example, the controller 1600 includes a volume up key 51, a volume down key 52, a PLAY / PAUSE key 53, a FF (Fast Forward) key 54, a REW (Rewind) key 55, and the like similar to those of the first embodiment.

[0122]

FIG. 15 is a diagram showing a procedure for attaching a headset. In FIG. 15, the R channel side is shown. It should be noted that the installation on the L channel side may be performed in the same manner. When attaching the headset 1000 according to the second embodiment, as shown in FIG. 15A, while inserting the R-side hanger 1200 behind the ear, the L-side earpiece 1330 is inserted into the ear. 15B, the R-side hanger 1200 follows the shape of the ear, and furthermore, the base of the ear is sandwiched between the R-side hanger 1200 and the R-side housing 1310. As shown in FIG. 15B, when the R-side earpiece 1330 is inserted into the ear, The position of the R side housing 1310, the position, orientation and shape of the R side hanger 1200 are adjusted. As a result, as shown in FIG. 15C, the headset 1000 can be mounted with the R-side hanger 1200 caught by the ear and in a stable state.

[0123]

FIG. 16 is a block configuration diagram of a headset 1000 including an L channel unit 1500, an R channel unit 1300, and a controller 1600. The block configuration of the headset 1000 differs from that of the first embodiment in that the charge state display LED 1313 and the power reception terminal 1311 are provided in the R channel unit 1300 and the function key 1314 is provided. Since other configurations are the same as those of the first embodiment, the same reference numerals as those in the first embodiment are attached and explanations thereof are omitted.

[01 24]

The power receiving terminal 1 31 1 is connected to the charging IC 62 via a power supply wire inserted through the cord 1 1 00 and is brought into contact with the power supply terminal 3300 provided in the cradle 2000 so that the current . The status display LED 1 31 3 is connected to the charging IC 62 via a control line through which the code 1 1 00 is inserted. By turning on or blinking under the control of the charging IC 62, it is determined whether the secondary battery 61 is being charged or not Notify the user. The charging IC 62 monitors the amount of charge of the secondary battery 61 , and performs control so that the status display LED 1 31 3 is turned off when the secondary battery 61 is fully charged. In this way, it is possible to notify the user that the charging is completed.

[01 25]

The function key 1 31 4 is connected to the parallel I / O interface 76. A control signal from the function key 1 31 4 corresponding to various input operations is transmitted to the control unit 71 via the parallel I / O interface 76 and the bus 72.

[01 26]

[2 — 2 . Configuration of cradle] Next, the configuration of the cradle 2000 accommodating the headset 1 000 will be described. FIG. 1 7A is an external perspective view showing a state in which the lid 4000 of the cradle 2000 is opened. 1 7B is an external perspective view showing a state in which the lid 4000 of the cradle 2000 is closed. 1 8A is a plan view showing the upper surface side of the cradle 2000 with the lid 4000 open, and FIG. 1 8B is a plan view showing the bottom side of the cradle 2000. FIG.

[01 27]
The cradle 2000 is composed of a cradle main body 3000 and a lid 4000, and a lid 4000 is connected to the cradle main body 3000 so as to be opened and closed by a hinge.

[01 28]

The cradle main body 3000 plays a role of housing the head set 1000.

The cradle main body 3000 is configured to have a substantially circular shape in a plan view and further has a certain thickness so as to be able to house the head set 1000. The cradle main body 3000 is made of a synthetic resin such as plastic, for example.

[0129]
On the upper surface of the cradle main body 3000, a groove-like R channel unit housing portion 3100 for housing the R channel unit 1300 of the head set 1000 and a groove like L channel unit for housing the L channel unit 1500 of the head set 1000 A storage portion 3200 is formed.

[0130]

The R channel unit housing section 3100 includes an R side housing housing section 3110 for housing the R side housing 1310 of the R channel unit 1300 of the headset 1000 and an R side earpiece housing section 316 for housing the R side earpiece 1330 constituting the R channel unit 1300 3120 in a substantially L-shape in plan view.

The R channel unit housing portion 3100 is formed as a groove having a shape corresponding to the shape of the R channel unit 1300 so that the R channel unit 1300 of the head set 1000 fits. The R-side earpiece housing portion 3120 is formed in a groove shape having a substantially semicircular shape in cross section so that the R-side earpiece 1330 fits. In addition, an approximately semicircular R side concave portion 3130 which can insert a finger is formed so that the user can grasp the R channel unit 1300 when taking out the R channel unit 1300 from the cradle 2000.

[0131]

The L channel unit housing section 3200 also has the same shape as the R channel unit housing section 3100 and includes an L housing housing section 3210 for housing the L channel unit 1500 of the head set 1000 and an L housing housing section 3210 for housing the earpieces constituting the L channel unit 1500 From the side earpiece housing portion 3220 in a

substantially L shape in plan view. The L-side housing accommodating portion 3210 is formed as a groove having a shape corresponding to the shape of the L-side housing 1510 so that the L-side housing 1510 of the L-channel unit 1500 fits. The L-side earpiece housing portion 3220 is formed in a groove shape having a substantially semicircular shape in cross section so that the L-side earpiece 1530 fits. In addition, a substantially semicircular L side recessed portion 3230 is formed to allow fingers to hold the L channel unit 1500 so that the user can grasp the L channel unit 1500 from the cradle 2000.

[0132]

The R channel unit housing section 3100 and the L channel unit housing section 3200 are formed symmetrically in the cradle main body 3000. The R channel unit housing section 3100 is formed such that the R side housing housing section 3110 is located inside the upper surface of the cradle main body 3000 and the R side earpiece housing section 3120 faces outward. Similarly, the L-channel unit housing section 3200 is formed such that the L-side housing storage section 3210 is located inside the upper surface of the cradle main body 3000 and the L-side earpiece storage section 3220 faces outward.

[0133]

Therefore, in the headset 1000, the R-side housing 1310 and the L-side housing 1510 come close to each other, and the R-side earpiece 1330 and the L-side earpiece 1530 are housed in a state facing outward. As a result, the R-side hanger 1200 connected to the R-side housing 1310 and the L-side hanger 1400 connected to the L-side housing 1510 come close to each other, and one end side of the cord 1100 to which the R-side hanger 1200 is connected and the L side The other end side of the cord 1100 to which the hanger 1400 is connected also comes close. As a result, it is possible to compactly code the code 1100, and it is easy to group the code 1100.

[0134]

As shown in FIG. 18A, a power supply terminal 3300 is provided on the side surface of the R-side housing storage portion 3110. The power supply terminal 3300 is provided at a position corresponding to the power reception terminal 1311 in a state where the R side housing 1310 is housed in the R side housing storage portion 3110. By accommodating the R side housing 1310 in the R side housing accommodating portion 3110, the power receiving terminal 1311 and the

power supply terminal 3300 are brought into contact with each other, and the charging current is supplied to the head set 1000.

[0135]

A charge status display LED 3400 is provided between the upper surface of the cradle main body 3000, the R channel unit storage section 3100 and the L channel unit storage section 3200. The charge state display LED 3400 is turned on or blinked to indicate whether or not the battery provided in the cradle 2000 is in a charged state.

[0136]

Further, on the upper surface of the cradle main body 3000, a lid detection switch 3500 is provided. The lid detection switch 3500 can detect that the lid 4000 is closed, for example, by being pushed down by a protrusion provided on the lid 4000. However, the detection method is not limited to this, and any method may be used as long as it can be detected that the lid 4000 is closed. The lid detection switch 3500 is connected to a charge on / off switching section 510 provided inside the cradle 2000, and functions as a charge changeover switch for operating the charge on / off switching section 510. The lid detection switch 3500 has the same function as the unit detection switch 212 in the first embodiment.

[0137]

As shown in FIG. 18B, a USB terminal 3600 is provided on the bottom surface of the cradle main body 3000. The USB terminal 3600 connects the cradle 2000 to an outlet for supplying commercial power or an external power source such as a personal computer in order to charge a battery provided inside the cradle 2000.

[0138]

A battery remaining amount indicator LED 3700 is provided on the bottom surface of the cradle main body 3000. The battery remaining amount display LED 3700 indicates the remaining amount of the battery provided in the cradle 2000 to the user based on the number of blinks. For

example, it is conceivable to indicate the remaining amount of the battery to the user by turning on and blinking as follows. When the battery is fully charged, it lights continuously for several seconds as "usable (charging unnecessary)". When there is sufficient remaining battery power, it flashes at predetermined intervals (for example, one second) as "usable". Further, when the remaining amount of the battery is small, it blinks at intervals (for example, every 0.5 seconds) shorter than "usable" as "charge necessary". Furthermore, it does not light up when there is no remaining battery.

[0139]

Further, on the bottom surface of the cradle main body 3000, a remaining amount display switch 3800 is provided. The remaining amount display switch 3800 is a switch for turning on the battery remaining amount display LED 3700. In the present embodiment, the battery remaining amount indicator LED 3700 is not normally turned on, and is configured to light up only when an input is made to the remaining amount display switch 3800. It is possible to suppress consumption of the battery by turning on only when the user wishes to confirm the remaining amount of the battery without always lighting the battery remaining amount display LED 3700. It should be noted that the battery remaining amount LED 3700 is preferably turned off automatically after a predetermined time (for example, 4 to 5 seconds) has elapsed since it was input to the remaining amount display switch 3800 and turned on or flashed.

[0140]

Like the cradle main body 3000, the lid 4000 is formed in a plate shape having a substantially circular shape in plan view. The lid 4000 covers the upper surface of the cradle main body 3000 in a closed state, and is rotatably connected to the cradle main body 3000 via a hinge. The lid 4000 and the cradle main body 3000 may be easily opened and closed while the lid 4000 is kept in a closed state, for example, by claws engaging with each other, velcro tape (registered trademark), or the like.

[0141]

FIG. 19 is a block diagram showing the configuration of the cradle 2000. The cradle 2000 includes a control unit 501, a bus 502, a RAM 503, a ROM 504, a USB terminal 3600, and a USB interface 506. Further, it includes a parallel I / O interface 505, a battery 507, a charging IC 508,

a charging state display LED 3400, a battery remaining amount display LED 3700, and a remaining amount display switch 3800. Furthermore, it includes a charging path switching unit 509, a charge on / off switching unit 51 0, a lid detection switch 3500, a DC / DC converter 511, and a power supply terminal 3300. In the block configuration of the cradle 2000 according to the second embodiment, the parts other than the battery remaining amount display LED 3700 and the lid detection switch 3500 are the same as those in the first embodiment, so the description thereof will be omitted.

[01 42]

The lid detection switch 3500 has the same function as the unit detection switch 21 2 in the first embodiment. The charge on / off switching unit 51 0 is connected to a lid detection switch 3500. The first on / off switch 51 0a and the second on / off switch 51 0b of the charging on / off switching section 51 0 are both normally off. When the lid detecting switch 3500 detects that the lid 4000 of the cradle 2000 is closed, in conjunction therewith And is configured to be turned on. When the cover 4000 is opened and turned off, the first switch and the second switch are turned off in conjunction with the opening. As a result, the headset 1 000 is stored in the cradle 2000, and when the lid 4000 is closed, the headset 1 000 is charged.

[01 43]
The battery remaining amount indicator LED 3700 is connected to the charging IC 62 via the remaining amount display switch 3800, and only when the remaining amount display switch 3800 is turned on under the control of the charging IC 62, the battery indicator I do.

[01 44]

[2 — 3.

Storing the headset with the cradle] The cradle 2000 is constituted as described above. Next, a state where the headset 1 000 is stored in the cradle 2000 will be described with reference to FIG. 20. FIG. 20 is a perspective view showing a state in which the headset 1 000 is housed in the cradle 2000.

[01 45]

As shown in FIG. 20, the L channel unit 1500 is fitted into the L channel unit housing section 3200 and the R channel unit 1300 is fitted in the R channel unit housing section 3100, whereby the head set 1000 is stored.

[0146]

In the present embodiment, the R channel unit 1300 is housed in the unit housing section 210 so that the status display LED 1313 provided on the R side housing 1310 is exposed to the upper surface side.

Thus, the user can visually recognize the status display LED 1313 of the head set 1000 and the charge state display LED 3400 provided in the cradle main body 3000 at the same time. Therefore, the user can easily grasp the state of charging, such as which one of headset 1000 and cradle 2000 is being charged.

[0147]

Also, when the R channel unit 1300 is stored in the R channel unit housing section 3100, the function key 1314 provided on the bottom face of the R side housing 1310 faces the side face of the groove shaped R channel unit housing section 3100 It is not exposed on the upper surface of the cradle main body 3000. Thus, it is possible to prevent the headset 1000 from malfunctioning by mistakenly depressing the function key 1314 in a state of being housed in the cradle 2000.

[0148]

FIG. 21 shows a state in which the headset 1000 is housed in the cradle 2000 and the lid 4000 of the cradle 2000 is closed. As shown in FIG. 21, in a state in which the lid 4000 is closed, the R channel unit 1300 and the L channel unit 1500 housed in the cradle main body 3000 are covered by the lid 4000. As a result, it is possible to prevent dust and dirt from adhering to the R channel unit 1300 and the L channel unit 1500. Further, it is also possible to prevent the R channel unit 1300 and the L channel unit 1500 from being damaged.

[0149]

In the present embodiment, since the lid detection switch 3500212 is provided in the cradle main body 3000, when the lid 4000 is closed, the lid detection switch 3500212 is turned on. As a result, the charge on / off switching section 510 is turned on, and charging of the secondary battery 61 of the headset 1000 is started.

[0150]

In the present technology, since the secondary battery 61 of the headset 1000 can be charged with power from the battery of the cradle 2000, the headset 1000 can be charged without connecting to the AC adapter or the personal computer. Therefore, it is possible to charge the headset 1000 even on the go. Furthermore, since the headset 1000 is charged during carrying, it is possible to avoid situations where the remaining capacity of the battery is insufficient and the headset 1000 can not be used. < 3 . Modifications> Although one embodiment of the present technology has been specifically described above, the present technology is not limited to the above-described embodiments, and various modifications based on the technical idea of the present technology are possible is there. For example, in the above-described embodiment, the case where the headset 1 is housed in the cradle 100 has been described as an example, but it is not limited to the headset 1, and only the sound output function is provided, and the microphone 80 is not provided Headphones may be stored.

[0151]

In the above-described embodiment, the headset 1 is described as a Bluetooth device having a battery, but the headset 1 is not limited to a Bluetooth device, and any device may be used as long as it is driven by a battery. For example, wireless headphones employing a communication method other than Bluetooth, noise canceling headphones, and the like are cited.

[0152]
Further, the present technology can take the following configuration.

[0153]
(1) A headphone including a cord, a pair of headphone units provided at both ends of the cord, and a secondary battery accommodated in the headphone unit, the cradle main body and the

cradle main body A cord wound portion provided on the cradle main body and around which the cord is wound; a charging means provided in the cradle main body for charging the secondary battery; And a cradle.

[0154]
(2) The cradle according to (1), wherein the cord winding portion is a groove provided on the entire circumference of the side surface of the cradle main body.

[0155]
(3) The headphone unit housing portion is a recessed portion provided on the upper surface of the cradle main body and engaged with the headphone unit, and is connected to the cradle main body so as to be openable and closable, and in the closed state, the headphone unit The cradle according to (1) or (2) above, further comprising a lid for covering the storage portion.

[0156]
(4) The headphone may further include a controller provided integrally with the cord, wherein the cradle main body further includes a controller storage portion for accommodating the controller in a state where the cord is wound around the cord winding portion, The cradle according to any one of (3) to (3), wherein the lid covers the headphone unit housing portion in a closed state and covers the controller housing portion.

[0157]
(5) The cradle according to (3) or (4), wherein the lid supports the cradle main body in an upright state in an opened state.

[0158]
(6) The headphone unit according to any one of the above (1) to (6), further comprising a storage detection unit that detects that the headphone unit is housed in the headphone unit storage unit, wherein the charging unit detects that the headphone unit is housed in the headphone unit storage unit (1) to (5), wherein the charging of the secondary battery is performed when it is detected that the secondary battery is charged.

[0159]
(7) The charging means may include first charging means for charging the secondary battery with an external power supply and second charging means for charging the secondary battery

with a battery provided in the cradle main body The cradle according to any one of (1) to (6) above.

[0160]

(8) The cradle according to (7), wherein the battery can be charged by the first charging means.

[0161]

(9) The headphone unit may include a flat-shaped housing having a substantially circular shape in a plan view and an earpiece provided in the housing, wherein the secondary battery is formed in a flat shape having a substantially circular shape in plan view, Wherein the headphone unit is housed in a housing of at least one of the pair of headphone units such that a thickness direction thereof is substantially perpendicular to a direction in which the earpiece is provided in the housing, (1) to (8), wherein the headphone unit is formed to have a depth corresponding to a thickness of the headphone unit.

[0162]

1 ... Headset 2 ... Code 3 ... L channel unit 4 ... R channel unit 5 ... controller 31 ... L side housing 32 ... L side earpiece 41 ... R side housing 42 ... R side earpiece 61 ... secondary battery 100 ... cradle 200 ... cradle main body 210 ... unit housing part 212 .. unit detection switch 232 controller housing 232 cord winding portion 300 lid 507 battery

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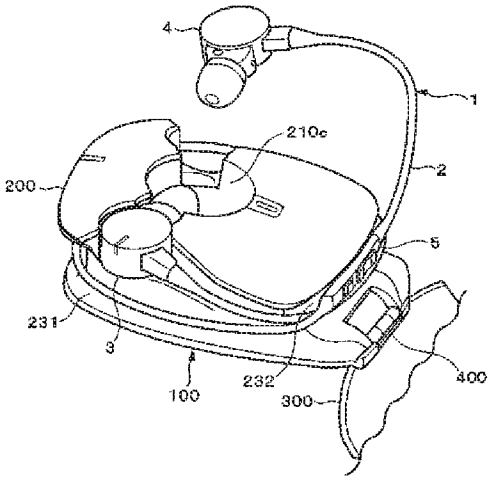
最終頁に続く

(54)【発明の名称】クレードル

(57)【要約】
【課題】長尺のコードを有するヘッドホンをコードが絡まることなくコンパクトに収納することができるとともに、ヘッドホンの充電も行うことができるクレードルを提供する。
【解決手段】クレードル１００はクレードル本体２００とクレードル本体２００に開閉可能に接続された蓋とからなる。クレードル本体２００の上面にはヘッドセット１のＬチャンネルユニット３とＲチャンネルユニット４とを収納するユニット収納部２１０が形成されている。またクレードル本体２００の側面は湾曲面状溝であるコード巻き付け部２３１が形成されている。ヘッドセット１のＬチャンネルユニット３とＲチャンネルユニット４をユニット収納部２１０に収納するとともに、コード２をコード巻き付け部２３１にまきつけることにより、ヘッドセット１をコンパクトに収納することができる。
【選択図】図１１



【特許請求の範囲】
【請求項１】
コードと、
該コードの両端に設けられた一対のヘッドホンユニットと、
該ヘッドホンユニット内に収納された二次電池とを備えるヘッドホンを収納可能であり、
クレードル本体と、
該クレードル本体に設けられ、前記一対のヘッドホンユニットを収納するヘッドホンユニット収納部と、
前記クレードル本体に設けられ、前記コードが巻き付けられるコード巻き付け部と、
前記クレードル本体内に設けられ、前記二次電池を充電する充電手段と
を備えるクレードル。
【請求項２】
前記コード巻き付け部は、前記クレードル本体の側面全周に設けられた溝である
請求項１に記載のクレードル。
【請求項３】
前記ヘッドホンユニット収納部は、前記クレードル本体の上面に設けられ、前記ヘッドホンユニットが嵌合する凹部であり、
前記クレードル本体に開閉可能に接続されており、閉じた状態においては前記ヘッドホンユニット収納部を覆う蓋をさらに備える
請求項１に記載のクレードル。
【請求項４】
前記ヘッドホンは、前記コードに一体に設けられたコントローラをさらに備え、
前記クレードル本体は、前記コード巻き付け部に前記コードが巻き付けられた状態において前記コントローラを収納するコントローラ収納部をさらに備え、
前記蓋は、閉じた状態においては前記ヘッドホンユニット収納部を覆うと共に前記コントローラ収納部を覆う
請求項３に記載のクレードル。
【請求項５】
前記蓋は、開いた状態においては前記クレードル本体を起立した状態で支持する
請求項３に記載のクレードル。
【請求項６】
前記ヘッドホンユニットが前記ヘッドホンユニット収納部に収納されたことを検出する収納検出手段をさらに備え、
前記充電手段は、前記収納検出手段により前記ヘッドホンユニットが前記ヘッドホンユニット収納部に収納されたことが検出された場合に前記二次電池に対する充電を行う
請求項１に記載のクレードル。
【請求項７】
前記充電手段は、外部電源により前記二次電池を充電する第１の充電手段と、前記クレードル本体内に設けられたバッテリにより前記二次電池を充電する第２の充電手段とからなる
請求項１に記載のクレードル。
【請求項８】
前記バッテリは、前記第１の充電手段により充電可能である
請求項７に記載のクレードル。
【請求項９】
前記ヘッドホンユニットは平面視略円形の扁平状に形成されたハウジングと該ハウジングに設けられたイヤピースとを備え、
前記二次電池は、平面視略円形の扁平状に形成されており、厚さ方向が前記ハウジングに前記イヤピースが設けられる方向に対して略垂直になるように、前記一対のヘッドホン

ユニットのうちの少なくともいずれか一方の前記ヘッドホンユニットのハウジング内に収納され、
前記ヘッドホンユニット収納部は、前記ヘッドホンユニットの厚さに対応する深さを有するように形成されている
請求項１に記載のクレードル。
【発明の詳細な説明】
【技術分野】
【０００１】
本技術は、クレードルに関し、詳しくはコードを有するヘッドホンなどを収納することができるクレードルに関する。
【背景技術】
【０００２】
近年、ＭＰ３プレーヤなどの音楽再生装置、音楽再生機能を備える携帯端末などで音楽を楽しむ場合において、音声出力手段として例えばBluetooth（登録商標）方式による近距離無線通信機能を備えるヘッドホンが用いられている。
【０００３】
Bluetooth方式を採用したヘッドホンを用いるとヘッドホンと携帯端末などは無線で接続されるため、ヘッドホンと携帯端末などを接続するコードが必要なく、コードの存在による煩わしさを解消することができる。しかし、無線接続であるため、ヘッドホンは携帯端末などから電力供給を受けることができない。現在、いわゆるワイヤレス電力などと称される非接触電力伝送技術も提案されているが、まだ幅広く実用化される段階には至っていない。そのため、Bluetooth方式を採用したヘッドホンは通常ヘッドホンを構成する各部への電力供給のためにバッテリを備えている。
【０００４】
なお、バッテリを備えるヘッドホンはBluetooth方式を採用したものに限られず、他の無線通信方式を採用したもの、ノイズキャンセリング用のＤＳＰ（Digital Signal Processor）を備えるノイズキャンセリングヘッドホンなどもある。
【０００５】
それらのバッテリを備えるヘッドホンは、接続される携帯端末などから電力供給をうけることができないため、バッテリの充電がなくなると使用することができなくなってしまうという問題がある。また、携帯して持ち運ぶ場合、かばん、ポケットなどにそのままの状態で入れるとゴミや汚れが付着したり、破損してしまうおそれがある。
【０００６】
そこで、ヘッドセットを収納するための保護ケースと充電器とを備えるヘッドセットキャリー装置が提案されている（特許文献１）。
【先行技術文献】
【特許文献】
【０００７】
【特許文献１】特表２００６－５０４３０４号公報
【発明の概要】
【発明が解決しようとする課題】
【０００８】
特許文献１に記載のヘッドセットキャリー装置においては、保護ケースによりヘッドセットを収納することができる。しかし、その構成は長尺のコードの存在を考慮したものではない。よって、コードを有するヘッドセット、ヘッドホンを収納しようとしてもうまく収納することができない、または収納することができても保護ケース内でコードが絡まってしまうおそれがある。
【０００９】
したがって、本技術の目的は、長尺のコードを有するヘッドホンをコードが絡まることなくコンパクトに収納することができるとともに、ヘッドホンの充電も行うことができる

クレードルを提供することにある。
【課題を解決するための手段】
【００１０】
上述した課題を解決するために、本技術は、コードと、コードの両端に設けられた一対のヘッドホンユニットと、ヘッドホンユニット内に収納された二次電池とを備えるヘッドホンを収納可能であり、クレードル本体と、クレードル本体に設けられ、一対のヘッドホンユニットを収納するヘッドホンユニット収納部と、クレードル本体に設けられ、コードが巻き付けられるコード巻き付け部と、クレードル本体内に設けられ、二次電池を充電する充電手段とを備えるクレードルである。
【発明の効果】
【００１１】
本技術によれば、コードを有するヘッドホンをコードが絡まることなくコンパクトに収納することができるとともに、ＡＣアダプタなどを介して外部電源に接続することなくヘッドホンを充電することができる。
【図面の簡単な説明】
【００１２】
【図１】本技術に係るクレードルに収納されるヘッドセットの外観図である。
【図２】ヘッドセットを構成するＬチャンネルユニットの外観構成を示す外観斜視図および六面図である。
【図３】ヘッドセットを構成するＲチャンネルユニットの外観構成を示す外観斜視図および六面図である。
【図４】ヘッドセットを構成するコントローラの外観構成を示す外観斜視図および六面図である。
【図５】ヘッドセットの構成を示すブロック図である。
【図６】本技術に係るクレードルの蓋が開いた状態を示す外観図である。
【図７】クレードルの蓋が閉じた状態を示す外観図である。
【図８】クレードルのＬ側ユニット収納部周辺の拡大図である。
【図９】クレードルの蓋がスタンドとして機能する状態を示す側面図である。
【図１０】クレードルの構成を示すブロック図である。
【図１１】ヘッドセットをクレードルに収納する手順を説明するための図である。
【図１２】クレードルにヘッドセットが収納されている状態を示す図である。
【図１３】本技術の第２の実施の形態に係るクレードルに収納されるヘッドセットの外観図である。
【図１４】ヘッドセットを構成するＲチャンネルユニットの外観図である。
【図１５】ヘッドセットの装着状態を示す図である。
【図１６】ヘッドセットの構成を示すブロック図である。
【図１７】図１７Ａは、本技術の第２の実施の形態に係るクレードルの蓋が開いた状態を示す外観斜視図であり、図１７Ｂはクレードルの蓋が開いた状態を示す外観斜視図である。
【図１８】図１８Ａはクレードルの上面側を示す平面図であり、図１８Ｂはクレードルの底面側を示す平面図である。
【図１９】クレードルの構成を示すブロック図である。
【図２０】クレードルにヘッドセットが収納され、蓋が開いている状態を示す外観図である。
【図２１】クレードルにヘッドセットが収納され、蓋が閉じている状態を示す外観図である。
【発明を実施するための形態】
【００１３】
以下、本技術の実施の形態について図面を参照しながら説明する。なお、説明は以下の順序で行う。

【００１４】

＜１．実施の形態＞

［１－１．ヘッドセットの構成］

図１は、ヘッドセット１の外観構成を示す図である。なお、ヘッドセット１とは音声を入力するためのマイクロホンを備えるヘッドホンであり、ヘッドホンに包含される概念であるものとする。ヘッドセット１は、ＭＰ３などの音楽データを再生可能であるとともに電話機能も有する携帯端末であるいわゆるスマートフォン（図示せず。）などに接続されて用いられる。また、ヘッドセット１はBluetooth方式の近距離無線通信によるデータの送受信が可能な機器であるものとする。本実施の形態においては、ヘッドセット１は音楽再生機能および電話機能を備える携帯端末にBluetooth方式を用いて接続されるものとする。携帯端末がBluetoothのマスターとして機能し、ヘッドセット１がスレーブとして機能する。

【００１５】

ヘッドセット１は、使用しない場合、充電する場合に本技術に係るクレードル１００に収納されることとなる。ヘッドセット１は、コード２、Ｌチャンネルユニット３、Ｒチャンネルユニット４、コントローラ５とから構成されている。

【００１６】

コード２は、内部にＬチャンネル用導線、Ｒチャンネル用導線、電力供給用線（いずれも図示せず。）などが挿通しており、オーディオ信号の伝送および電力供給を行うためのものある。コード２は、長さが長い第１コード部２１と、第１コード部２１に比べて長さが短い第２コード部２２とから構成されている。第１コード部２１の一端にはＬチャンネルユニット３が接続されており、他端はコントローラ５の一端側と接続されている。第２コード部２２は一端側はコントローラ５の他端に接続されており、他端にはＲチャンネルユニット４が接続されている。

【００１７】

図２は、Ｌチャンネルユニット３の構成を示す図である。図２Ａは外観斜視図であり、図２Ｂ乃至図２Ｇは六面図である。図２Ｂは正面図、図２Ｃおよび図２Ｄは側面図、図２Ｅは上面図、図２Ｆは底面図、図２Ｇは背面図である。Ｌチャンネルユニット３は、Ｌ側ハウジング３１、音導管（図示せず。）およびＬ側イヤピース３２とから構成されている。Ｌ側ハウジング３１は平面視略円形状に形成され、第１コード部２１と接続されている第１Ｌ側ハウジング部３１ａと、第２Ｌ側ハウジング部３１ｂとから構成されている。第２Ｌ側ハウジング部３１ｂは、側面の一端側が円形の凹状に形成され、側面の他端側が円形の凸状に形成されることにより正面視略三日月状に形成されている。そして、第２Ｌ側ハウジング部３１ｂは凹状に形成された一端側において第１Ｌ側ハウジング部３１ａに接続されることにより、第１Ｌ側ハウジング部３１ａの側面から第１Ｌ側ハウジング部３１ａに対する第１コード部２１の接続方向と略垂直方向に突出するように設けられている。

【００１８】

第１Ｌ側ハウジング部３１ａの内部には第１Ｌ側ハウジング部３１ａと同じく平面視略円形の扁平型に形成された二次電池６１（図２においては図示せず。）が収納されている。なお、本実施の形態においては、扁平型の二次電池６１にはいわゆるコイン型電池、ボタン型電池が含まれるものとする。二次電池６１としては例えばリチウムイオン二次電池

が用いられる。第１Ｌ側ハウジング部３１ａは二次電池６１の形状に対応するように平面視略円形の扁平型に形成されている。

【００１９】

図２Ｇに示すように第１Ｌ側ハウジング部３１ａの背面側には充電状態表示ＬＥＤ（Light Emitting Diode）３３が設けられている。充電状態表示ＬＥＤ３３は点灯または点滅することにより二次電池６１に対する充電がなされているか否かをユーザに示すための通知手段である。また、満充電となった場合には消灯することにより充電が完了したこともユーザに通知する。

【００２０】

図２Ｅに示すように、第２Ｌ側ハウジング部３１ｂの上面には小径のＬ側掛止用穴３５が形成されている。このＬ側掛止用穴３５に後述するクレードル１００の掛止用突起２１３が入り込むことにより、Ｌチャンネルユニット３はクレードル１００のユニット収納部２１０に収納された状態で保持される。

【００２１】

図２Ｆに示すように、第２Ｌ側ハウジング部３１ｂの底面から露出するように受電用端子３４が設けられている。受電用端子３４は後述するクレードル１００が備える給電用端子２１１と接触することにより二次電池６１に充電電流を供給するためのものである。

【００２２】

また、Ｌ側ハウジング３１内には音声処理回路などからなるドライバユニット（図示せず）が収納されている。そして、第２Ｌ側ハウジング部３１ｂの円形凸状に形成された他端側から第１Ｌ側ハウジング部３１ａに対する第１コード部２１の接続方向と略垂直方向に突出するように円筒状の音導管が導出されている。音導管内部にはドライバユニットに接続されたＬチャンネルスピーカ６３（図２において図示せず。）が設けられている。

【００２３】

Ｌ側イヤピース３２は中央を貫くように孔部３２ａが設けられた筒状に形成されている。また、先端に向かうに従い孔部３２ａ方向へ窄むように形成されている。その孔部３２ａに音導管が挿入されることにより、Ｌ側イヤピース３２はＬ側ハウジング３１に取り付けられている。すなわち、Ｌ側イヤピース３２は、音導管に対して、音導管の先端が孔部３２ａの開口から露出するように取り付けられている。Ｌ側イヤピース３２は、例えばシリコンゴムのような弾性材を用いて形成されており、自由に変形可能であるため、外耳道に挿入されると外耳道に密着することにより、装着状態を維持することができる。ユーザがＬ側イヤピース３２を耳の外耳道に挿入することにより、内部にＬチャンネルスピーカ６３を備える音導管がＬ側イヤピース３２を介してユーザの耳の外耳道に挿入されることになる。これにより、ユーザは携帯端末からヘッドセット１に送られる音声を聴取することができる。

【００２４】

なお、Ｌ側ハウジング３１の内部には二次電池６１に対する充電を制御する充電ＩＣ６２（図２においては図示せず。）などが設けられている。それらを含めたＬ側ハウジング３１内部の構成の詳細については後述する。

【００２５】

図３は、Ｒチャンネルユニット４の構成を示す図である。図３Ａは外観斜視図であり、図３Ｂ乃至図３Ｇは六面図である。図３Ｂは正面図、図３Ｃおよび図３Ｄは側面図、図３Ｅは上面図、図３Ｆは底面図、図３Ｇは背面図である。Ｒチャンネルユニット４は、Ｒ側ハウジング４１、音導管（図示せず。）およびＲ側イヤピース４２とから構成されている。Ｒ側ハウジング４１は平面視略円形状に形成され、第２コード部２２と接続されている第１Ｒ側ハウジング部４１ａと、第２Ｒ側ハウジング部４１ｂとから構成されている。第２Ｒ側ハウジング部４１ｂは、側面の一端側が円形の凹状に形成され、他端側が円形の凸状に形成されることにより正面視略三日月状に形成されている。そして、第２Ｒ側ハウジング部４１ｂは凹状に形成された一端側において第１Ｒ側ハウジング部４１ａに接続されることにより、第１Ｒ側ハウジング部４１ａの側面から第１Ｒ側ハウジング部４１ａに対

する第２コード２の接続方向と略垂直方向に突出するように設けられている。第１Ｒ側ハウジング部４１ａは、第１Ｌ側ハウジング部３１ａと同様に平面視略円形の扁平型に形成されている。

【００２６】

図３Ｂに示すように、第１Ｒ側ハウジング部４１ａの正面視略中央には円形状に形成されたコールキー４３が設けられている。このコールキー４３はヘッドセット１が接続される携帯端末が備える電話機能を用いて通話を開始する場合に、電話の受信の指示を入力するためのボタンである。コールキー４３はＲ側ハウジング４１の筐体との間に所定の輪状の隙間４４が形成されるように設けられている。

【００２７】

第１Ｒ側ハウジング部４１ａ内には携帯端末による通話用のマイクロホン８０（図３においては図示せず。）が設けられている。マイクロホン８０はＲ側ハウジング４１の筐体とコールキー４３との隙間４４を介して外部と連通するように構成されている。隙間４４を介してユーザの声がマイクロホン８０へ入力される。これによりユーザはいわゆるハンズフリー機能による通話を行うことができる。

【００２８】

さらに、第２Ｒ側ハウジング部４１ｂの正面には動作表示ＬＥＤ４５が設けられている。この動作表示ＬＥＤ４５は点灯または点滅することにより、ヘッドセット１の電源がＯＮになっておりヘッドセット１が動作状態であるということを示すものである。

【００２９】

図３Ｅに示すように、第２Ｒ側ハウジング部４１ｂの上面には小径のＲ側掛止用穴４７が形成されている。このＲ側掛止用穴４７に後述するクレードル１００の掛止用突起２１３が入り込むことにより、Ｒチャンネルユニット４はクレードル１００のユニット収納部２１０に収納された状態で保持される。

【００３０】

図３Ｆに示すように、第２Ｒ側ハウジング部４１ｂの底面には小径の穴が形成されており、その穴の中にリセットキー４６が設けられている。このリセットキー４６は、例えば、先の尖った細い針金のようなものを穴に挿入することにより押圧可能なボタンであり、ヘッドセット１の電源を強制的にオフにするためのものである。いかなる動作中であってもリセットキー４６が押圧された場合にはヘッドセット１の電源はオフになる。

【００３１】

なお、Ｒ側ハウジング４１の内部にはヘッドセット１全体の制御などを行う制御部７１、Bluetoothモジュール７７（共に図３においては図示せず。）などが設けられている。それらを含めたハウジング内部の構成の詳細については後述する。

【００３２】

図４は、コントローラ５の構成を示す図である。図４Ａは外観斜視図であり、図４Ｂ乃至図４Ｇは六面図である。図４Ｂは正面図、図４Ｃおよび図４Ｄは側面図、図４Ｅは上面図、図４Ｆは底面図、図４Ｇは背面図である。コントローラ５はヘッドセット１が接続される携帯端末に対する各種操作入力を行うための入力手段である。コントローラ５はボリュームアップキー５１、ボリュームダウンキー５２、ＰＬＡＹ／ＰＡＵＳＥキー５３、ＦＦ（Fast Forward）キー５４、ＲＥＷ（Rewind）キー５５を備える。

【００３３】

ボリュームアップキー５１およびボリュームダウンキー５２はヘッドセット１から出力される音声の音量を調整するためのボタンである。本実施の形態においては、ボリュームアップキー５１およびボリュームダウンキー５２は一体に形成されたシーソースイッチとして構成されている。ただし、別々のボタンとして構成してもよい。

【００３４】

ＰＬＡＹ／ＰＡＵＳＥキー５３はヘッドセット１が接続される携帯端末に対して楽曲などの再生、停止指示の入力を行うためのボタンである。本実施の形態においてはＰＬＡＹ／ＰＡＵＳＥキー５３は単一のボタンとして構成されており、楽曲再生状態においては停

止ボタンとして機能し、楽曲停止中には再生ボタンとして機能するいわゆるトグルボタンである。

【００３５】

なお、本実施の形態においては、ＰＬＡＹ／ＰＡＵＳＥキー５３を所定の時間（例えば７秒）以上押圧し続けると、その入力操作に対応する制御信号が制御部７１に送信され、ヘッドセット１がペアリングモードに移行するように構成されている。ペアリングとは、２つの機器間において互いがデータなどの送受信の対象であることを設定する処理である。本実施の形態においてペアリングは、ヘッドセット１と携帯端末との間で双方のＩＤ（識別情報）とパスキー（暗証コード）を交換することにより実行される。ＩＤは、ヘッドセット１、携帯端末のそれぞれを特定することができるアドレスであり、パスキーは２つの機器間でそれぞれ設定する暗証コードで同一である場合にのみ機能する。

【００３６】

ＦＦキー５４は携帯端末により再生される楽曲などの曲送りを行うためのボタンである。ＲＥＷキー５５は携帯端末により再生される楽曲などの曲戻しを行うためのボタンである。本実施の形態においては、ＦＦキー５４およびＲＥＷキー５５はＰＬＡＹ／ＰＡＵＳＥキー５３と一体に構成されている。すなわち、ＰＬＡＹ／ＰＡＵＳＥキー５３は押下されることによりＰＬＡＹ／ＰＡＵＳＥキーとして機能し、横方向にスライドさせることにより、そのスライド方向に応じてＦＦキー５４またはＲＥＷキー５５として機能する。

【００３７】

図５はＬチャンネルユニット３、Ｒチャンネルユニット４およびコントローラ５を含むヘッドセット１の構成を示すブロック図である。

【００３８】

Ｌチャンネルユニット３は、二次電池６１、受電用端子３４、充電ＩＣ６２、充電状態表示ＬＥＤ３３、およびＬチャンネルスピーカ６３を備える。上述したように二次電池６１は例えば、扁平型のリチウムイオン二次電池６１である。二次電池６１からＬチャンネルユニット３、Ｒチャンネルユニット４およびコントローラ５に電力が供給される。なお、Ｌチャンネルユニット３、Ｒチャンネルユニット４およびコントローラ５はコード２内部に挿通する電力供給用線（図示せず。）で接続されている。

【００３９】

受電用端子３４は充電ＩＣ６２に接続されており、後述するクレードル１００が備える給電用端子２１１と接触することにより充電ＩＣ６２を介して二次電池６１に電流を供給する。充電ＩＣ６２は例えば、定電流定電圧充電など所定の充電方式に基づいて二次電池６１の充電がなされるように充電を制御するものである。充電状態表示ＬＥＤ３３は充電ＩＣ６２による制御に基づいて点灯または点滅することにより、二次電池６１に対する充電がなされているか否かをユーザに示すための通知手段である。充電ＩＣ６２は二次電池６１の充電量を監視し、二次電池６１が満充電になった場合には充電状態表示ＬＥＤ３３が消灯するように制御を行う。これにより、充電が完了したことをユーザに通知することができる。

【００４０】

Ｒチャンネルユニット４は、制御部７１、バス７２、ＲＡＭ７３（Random Access Memory）、ＲＯＭ７４（Read Only Memory）、シリアルＩ／Ｏインターフェース７５、パラレルＩ／Ｏインターフェース７６を備える。またBluetoothモジュール７７、アンテナ７８、Ｒチャンネルスピーカ７９およびマイクロホン８０を備える。さらに、コールキー４３、動作表示ＬＥＤ４５、リセットキー４６を備える。

【００４１】

制御部７１は、例えば所定の処理を行うＣＰＵ（Central Processing Unit）である。ＲＡＭ７３は、制御部７１のワークメモリとして用いられる。ＲＯＭ７４には、制御部７１により読み込まれ動作されるプログラムなどが記憶されている。制御部７１は、バス７２を介してＲＡＭ７３およびＲＯＭ７４と接続されており、ＲＯＭ７４に記憶されたプログラムに従い様々な処理を実行してコマンドの発行を行うことによってヘッドセット１全

体の制御を行う。

【００４２】

シリアルＩ／Ｏインターフェース７５はバス７２を介して制御部７１と接続されている。シリアルＩ／Ｏインターフェース７５にはBluetoothモジュール７７が接続されている。Bluetoothモジュール７７は、Bluetooth方式の近距離無線通信によるデータの送受信が可能なモジュールである。Bluetoothモジュール７７によって、マスターとしての外部Bluetooth機器である携帯端末とのデータのやり取りが行われる。本実施の形態においては、携帯端末がBluetoothのマスターとして機能し、ヘッドセット１がスレーブとして機能する。

【００４３】

Bluetoothモジュール７７には、アンテナ７８、Ｒチャンネルスピーカ７９、マイクロホン８０およびＬチャンネルスピーカ６３が接続されている。なお、Ｌチャンネルスピーカ６３はＬチャンネルユニット３における音声出力手段であり、Ｒチャンネルスピーカ７９はＲチャンネルユニット４における音声出力手段である。Bluetoothモジュール７７とＬチャンネルスピーカ６３とはコード２によって接続されている。

【００４４】

外部Bluetooth機器である携帯端末から音声データを受信する場合、Bluetoothモジュール７７は携帯端末から送信された音声データをアンテナ７８で受信して、内蔵する信号処理部に供給する。そして、信号処理部において、音声データに所定の信号処理を施すことによって音声信号を生成し、Ｌチャンネルスピーカ６３、Ｒチャンネルスピーカ７９に供給する。これにより、Ｌチャンネルスピーカ６３、Ｒチャンネルスピーカ７９から携帯端末が再生する楽曲などが音声として出力される。

【００４５】

また、携帯端末が備える電話機能を用いて受話を行う場合、Bluetoothモジュール７７は、携帯端末から送信された受話音声データをアンテナ７８で受信して、内蔵する信号処理部に供給する。そして、信号処理部において、音声データに所定の信号処理を施すことによって音声信号を生成し、Ｌチャンネルスピーカ６３、Ｒチャンネルスピーカ７９に供給する。これにより、Ｌチャンネルスピーカ６３、Ｒチャンネルスピーカ７９から受話音声が出力される。

【００４６】

さらに、携帯端末が備える電話機能を用いて送話を行う場合、マイクロホン８０はユーザの声などの音声を取得して音声信号に変換する。音声信号は、Bluetoothモジュール７７に供給される。Bluetoothモジュール７７は、内蔵する信号処理部において、マイクロホン８０から供給された音声信号に所定の信号処理を施して音声データを生成する。生成された音声データは、アンテナ７８を介して外部Bluetooth機器である携帯端末に送信される。このようにして、ユーザはヘッドセット１および携帯端末を用いて通話を行うことができる。

【００４７】

パラレルＩ／Ｏインターフェース７６にはコールキー４３およびリセットキー４６が接続されている。上述したように、コールキー４３は電話の受信の指示を入力するためのボタンである。リセットキー４６はヘッドセット１の電源を強制的にオフにするためのボタンである。ユーザによりそれのボタンに対する入力（例えば押下）が行われると、その入力に応じた制御信号が生成されて、その制御信号がパラレルＩ／Ｏインターフェース７６およびバス７２を介して制御部７１に出力される。そして、制御部７１によりその制御信号に対応する処理が行われることにより、各種ボタンに対応する動作が行われる。

【００４８】

また、パラレルＩ／Ｏインターフェース７６には動作表示ＬＥＤ４５が接続されている。上述したように、動作表示ＬＥＤ４５は制御部７１による制御に基づいて点灯または点滅することによりヘッドセット１の電源がＯＮになっておりヘッドセット１が動作状態であることを示すものである。

【００４９】
さらに、パラレルＩ／Ｏインターフェース７６にはコントローラ５に設けられたボリュームアップキー５１、ボリュームダウンキー５２、ＰＬＡＹ／ＰＡＵＳＥキー５３、ＦＦキー５４およびＲＥＷキー５５が接続されている。これら各種キーとパラレルＩ／Ｏインターフェース７６とはコード２によって接続されている。ユーザによりこれらの各種キーに対する入力が行われると、その入力に応じた制御信号がパラレルＩ／Ｏインターフェース７６およびバス７２を介して制御部７１に出力される。そして、制御部７１によりその制御信号に対応する処理が行われることにより、各種キーに対応する動作が行われる。
【００５０】
［１－２．クレードルの構成］
次に、ヘッドセット１を収納するクレードル１００の構成について説明する。図６および図７はクレードル１００の外観構成を示す図である。また、図８はＬ側ハウジング収納部２１０ａ周辺の拡大図である。クレードル１００はクレードル本体２００と蓋３００とからなり、クレードル本体２００に対して蓋３００がヒンジ４００によって開閉可能に接続されている。図６はクレードル１００が開いている状態を示す図である。図６Ａは上面図、図６Ｂは底面図、図６Ｃおよび図６Ｄは側面図である。図７はクレードル１００が閉じている状態を示す六面図である。図７Ａが上面図、図７Ｂおよび図７Ｃが側面図、図７Ｄが正面図、図７Ｅが背面図、図７Ｆが底面図である。
【００５１】
クレードル本体２００は例えばプラスチックなどの合成樹脂により形成されており、ヘッドセット１を収納する役割を担うものである。クレードル本体２００の上面にはヘッドセット１のＬチャンネルユニット３およびＲチャンネルユニット４を収納するためのユニット収納部２１０が形成されている。
【００５２】
ユニット収納部２１０は、ヘッドセット１のＬチャンネルユニット３を収納するＬ側ハウジング収納部２１０ａ、Ｒチャンネルユニット４を収納するＲ側ハウジング収納部２１０ｂを有する。さらに、ユニット収納部２１０は、Ｌチャンネルユニット３およびＲチャンネルユニット４を構成するイヤピースを収納するイヤピース収納部２１０ｃを有する。
【００５３】
Ｌ側ハウジング収納部２１０ａおよびＲ側ハウジング収納部２１０ｂは、それぞれＬチャンネルユニット３およびＲチャンネルユニット４を構成するＬ側ハウジング３１、Ｒ側ハウジング４１が嵌合可能なようにクレードル１００の上面の左側および右側に左右対称に設けられている。Ｌ側ハウジング収納部２１０ａおよびＲ側ハウジング収納部２１０ｂは、ハウジングの形状に沿うように側面が湾曲状の溝状に形成されている。
【００５４】
イヤピース収納部２１０ｃはクレードル本体２００の上面の略中央、Ｌ側ハウジング収納部２１０ａとＲ側ハウジング収納部２１０ｂの間に設けられている。イヤピース収納部２１０ｃは、Ｌ側イヤピース３２およびＲ側イヤピース４２をまとめて収納可能なように十分な深さと広さを有する平面視略円形の凹状に形成されている。イヤピース収納部２１０ｃはＬ側ハウジング収納部２１０ａおよびＲ側ハウジング収納部２１０ｂと繋がるように形成されている。これにより、ハウジングとイヤピースとを備えるＬチャンネルユニット３およびＲチャンネルユニット４を収納することが可能となる。
【００５５】
図８に示すように、Ｌ側ハウジング収納部２１０ａの側面から突出するように給電用端子２１１が設けられている。給電用端子２１１は、Ｌ側ハウジング収納部２１０ａにＬ側ハウジング３１が収納された状態において受電用端子３４と対応する位置に設けられている。Ｌ側ハウジング収納部２１０ａにＬ側ハウジング３１が収納されることにより受電用端子３４と給電用端子２１１とが接触してヘッドセット１に対して充電電流の供給が行われる。
【００５６】

また、Ｌ側ハウジング収納部２１０ａの底面には上方に突出するように突起状のユニット検出スイッチ２１２が設けられている。ユニット検出スイッチ２１２は常時Ｌ側ハウジング収納部２１０ａの底面から突出するように構成されており、Ｌ側ハウジング収納部２１０ａにハウジングが嵌合することにより押圧される。よって、ユニット検出スイッチ２１２はヘッドセット１がクレードル１００に収納された場合に押圧されることにより、ヘッドセット１がクレードル１００に収納されたことを検出するものである。ユニット検出スイッチ２１２は特許請求の範囲における収納検出手段に相当するものである。

【００５７】

ユニット検出スイッチ２１２はクレードル１００内部に設けられた充電オンオフ切り替え部５１０に接続されており、押圧されることにより充電オンオフ切り替え部５１０を動作させる充電切り替えスイッチとして機能するものである。このように、ユニット検出スイッチ２１２はヘッドセット１の充電に関わるものであるため、二次電池６１が収納されているＬ側ハウジング収納部２１０ａが収納されるＬ側ハウジング収納部２１０ａに設けるとよい。なお、充電オンオフ切り替え部５１０による充電の切り替えの詳細については後述する。

【００５８】

さらに、Ｌ側ハウジング収納部２１０ａの側面から突出するように掛止用突起２１３が設けられている。掛止用突起２１３はＬチャンネルユニット３の第２Ｌ側ハウジング部３１ｂに設けられたＬ側掛止用穴３５に入り込むことによりＬチャンネルユニット３を嵌合した状態で掛止させるものである。Ｌ側ハウジング収納部２１０ａと同様に、Ｒ側ハウジング収納部２１０ｂにも同様の構成の掛止用突起が設けられている。これにより、不用意にＬチャンネルユニット３およびＲチャンネルユニット４がクレードル１００から外れてしまうことを防止することができる。

【００５９】

クレードル１００の上面には充電状態表示ＬＥＤ２１４が設けられている。充電状態表示ＬＥＤ２１４は点灯または点滅することによりクレードル１００内に設けられたバッテリ５０７が充電状態であることを示すものである。

【００６０】

クレードル１００の底面にはＵＳＢ（Universal Serial Bus）端子２２１が設けられている。ＵＳＢ端子２２１は、クレードル１００内部に設けられたバッテリ５０７を充電するためにクレードル１００を商用電源供給のためのコンセント、またはパーソナルコンピュータなどの外部電源に接続するためのものである。

【００６１】

また、クレードル１００の底面にはバッテリ残量表示部２２２が設けられている。バッテリ残量表示部２２２は一列に並べられた第１残量表示ＬＥＤ２２２ａ、第２残量表示ＬＥＤ２２２ｂおよび第３残量表示ＬＥＤ２２２ｃから構成されており、各ＬＥＤがそれぞれクレードル１００のバッテリの残量を示す。本実施の形態においては３つの残量表示ＬＥＤのうち左側に位置する第１残量表示ＬＥＤ２２２ａが充電量が最も多いことを示し、右側に位置する第３残量表示ＬＥＤ２２２ｃが充電量が最も少ないことを示している。中央の第２残量表示ＬＥＤ２２２ｂはその中間の充電量を示す。

【００６２】

なお、充電量が少ないことを示す第３残量表示ＬＥＤ２２２ｃはユーザに充電量が少ない旨を警告するために赤色に点灯するようにするとよい。そして、第１残量表示ＬＥＤ２２２ａおよび第２残量表示ＬＥＤ２２２ｂは充電量が十分にありクレードル１００の使用に問題がないことを示すために、赤色とは異なる色、例えば緑色に点灯するようにするとよい。ただし、バッテリ残量表示部２２２の構成はこれに限られず、より多くのＬＥＤで構成してもよく、また、点灯する色も緑や赤に限られるものではない。

【００６３】

残量表示スイッチ２２３は、バッテリ残量表示部２２２を点灯させるためのスイッチである。本実施の形態においては、バッテリ残量表示部２２２は通常は点灯しておらず、残

量表示スイッチ２２３に対して入力が行われた場合にのみ点灯するように構成されている。このように構成して、バッテリ残量表示部２２２を常時点灯させずにユーザがバッテリの残量を確認したい場合にのみ点灯させることによりバッテリ５０７の消費を抑制することができる。なお、バッテリ残量表示部２２２は残量表示スイッチ２２３に対する入力がなされて点灯した後、所定の時間（例えば２～３秒）経過後自動的に消灯するようにするとよい。

【００６４】

クレードル１００の底面には窪み部２２４が形成されている。詳しくは後述するが、この窪み部２２４は蓋３００が開いてクレードル本体２００を起立させるスタンドとして機能する場合において、蓋３００の衝合部３０３と衝合するためのものである。

【００６５】

クレードル本体２００の側面には全周にわたってコード巻き付け部２３１が形成されている。コード巻き付け部２３１は、クレードル本体２００の側面全周にわたって形成された湾曲面状の溝である。コード２はこの溝に巻き付けられることにより収納される。

【００６６】

蓋３００との接続位置方向におけるクレードル本体２００の側面はコード巻き付け部２３１として機能するとともにヘッドセット１のコントローラ５を収納するコントローラ収納部２３２として機能する。本技術においては、コード２がコード巻き付け部２３１に巻き付けられるとコントローラ収納部２３２にコントローラ５が位置するようにコード２の長さ、コントローラ５の取り付け位置が調整されている。

【００６７】

蓋３００は閉じられた状態においてクレードル本体２００の上面を覆うものであり、ヒンジ４００を介して回動可能にクレードル本体２００と接続されている。なお、図９に示すように、蓋３００はクレードル本体２００が起立する状態においてはクレードル本体２００を起立した状態で支持するスタンドとしても機能するものである。

【００６８】

蓋３００にはイヤピースカバー部３０２が設けられている。イヤピースカバー部３０２は、蓋３００が閉じられた状態において、クレードル本体２００に収納されているヘッドセット１のイヤピースが蓋３００内面に接触しないように蓋３００におけるイヤピースの対向する位置に設けられている。したがって、イヤピースカバー部３０２は蓋３００の外面においては凸状に形成され、蓋３００内面においては凹状に形成されている。

【００６９】

また、蓋３００のヒンジ４００との接続側の外側湾曲面は衝合部３０３として機能する。衝合部３０３は、クレードル本体２００を起立した状態で支持するためにクレードル本体２００の窪み部２２４と衝合するものである。したがって、衝合部３０３は窪み部２２４と的確に衝合するために窪み部２２４に対応した形状に構成されている。

【００７０】

クレードル本体２００を起立させるには、図９Ａに示す蓋３００が閉じた状態から図９Ｂに示すように、蓋３００の外面がクレードル本体２００の底面に接触するまで蓋３００を回転させる。そうすると、クレードル本体２００の底面に形成された窪み部２２４に蓋３００の衝合部３０３が衝合して蓋３００上にクレードル本体２００が載置する状態となる。これにより、蓋３００はスタンドとして機能し、クレードル本体２００を安定した状態で支持することができる。なお、蓋３００をスタンドとして機能させる場合、クレードル１００はヒンジ４００と蓋３００の先端３０１が机などの載置面に接触して起立することとなる。

【００７１】

図１０は、クレードル１００の構成を示すブロック図である。クレードル１００は制御部５０１、バス５０２、ＲＡＭ５０３、ＲＯＭ５０４、ＵＳＢ端子２２１、ＵＳＢインターフェース５０６を備える。また、パラレルＩ／Ｏインターフェース５０５、バッテリ５０７、充電ＩＣ５０８、充電状態表示ＬＥＤ２１４、バッテリ残量表示部２２２、残量表

示スイッチ２２３を備える。さらに、充電経路切り替え部５０９、充電オンオフ切り替え部５１０、ユニット検出スイッチ２１２、ＤＣ／ＤＣコンバータ５１１、給電用端子２１１を備える。

【００７２】

制御部５０１は、例えば所定の処理を行うＣＰＵである。ＲＡＭ５０３は、制御部５０１のワークメモリとして用いられる。ＲＯＭ５０４には、制御部５０１により読み込まれ動作されるプログラムなどが記憶されている。制御部５０１は、バス５０２を介してＲＡＭ５０３およびＲＯＭ５０４に接続されており、ＲＯＭ５０４に記憶されたプログラムに従い様々な処理を実行してコマンドの発行を行うことによってクレードル１００全体の制御を行う。

【００７３】

ＵＳＢ端子２２１は商用電源からの電力供給のためのコンセントやパーソナルコンピュータなどの外部電源にクレードル１００を接続する接続手段である。ＵＳＢ端子２２１を介して外部電源から充電電流が供給される。なお、外部電源との接続は必ずしもＵＳＢ規格を用いる必要はなく、ＡＣアダプタを介してクレードル１００をコンセントと接続するようにしてもよい。

【００７４】

ＵＳＢインターフェース５０６は、ＵＳＢ端子２２１に接続されるとともに、バス５０２を介して制御部５０１に接続されている。制御部５０１はＵＳＢインターフェース５０６を介してＵＳＢ端子２２１から供給される電圧および電圧に含まれる制御パルスを読み取り、接続された外部電源から得ることができる充電電流量を決定する。

【００７５】

バッテリ５０７は、例えば充電可能なリチウムイオン二次電池であり、クレードル１００全体への電力供給を行うと共に、ヘッドセット１の二次電池６１の充電用としての役割も担うものである。したがって、バッテリ５０７は満充電状態において、ヘッドセット１の二次電池６１を複数回充電できるように十分な電池容量を有するものを用いるとよい。なお、通常、ＵＳＢ端子２２１が外部電源に接続されている場合にはその外部電源からの電力でクレードル１００は動作し、バッテリ５０７は用いないものとする。すなわち、バッテリ５０７がクレードル１００全体に電力供給を行うのはＵＳＢ端子２２１が外部電源に接続されていない場合である。

【００７６】

充電ＩＣ５０８はパラレルＩ／Ｏインターフェース５０５を介して制御部５０１と接続されている。また、ＵＳＢ端子２２１およびバッテリ５０７にも接続されている。ＵＳＢ端子２２１から供給された充電電流は充電ＩＣ５０８を介してバッテリ５０７に供給される。充電ＩＣ５０８は例えば、定電流定電圧充電などの所定の充電方式に基づいてバッテリ５０７の充電がなされるように充電を制御するものである。また、充電ＩＣ５０８は充電状態表示ＬＥＤ２１４とも接続されており、バッテリ５０７に対する充電が行われている場合には充電状態表示ＬＥＤ２１４が点灯するように制御も行う。

【００７７】

バッテリ残量表示部２２２は、第１残量表示ＬＥＤ２２２ａ、第１コンパレータ２２２ｄ、第２残量表示ＬＥＤ２２２ｂ、第２コンパレータ２２２ｅ、第３残量表示ＬＥＤ２２２ｃ、第３コンパレータ２２２ｆとから構成されている。第１コンパレータ２２２ｄと第１残量表示ＬＥＤ２２２ａ、第２コンパレータ２２２ｅと第２残量表示ＬＥＤ２２２ｂ、第３コンパレータ２２２ｆと第３残量表示ＬＥＤ２２２ｃとがそれぞれ対応するように構成されている。バッテリ残量表示部２２２は残量表示スイッチ２２３を介してバッテリ５０７と接続されている。

【００７８】

第１コンパレータ２２２ｄ、第２コンパレータ２２２ｅおよび第３コンパレータ２２２ｆにはそれぞれ異なる閾値が設定されており、バッテリ５０７の残量とその閾値との比較を行う。そして、バッテリ５０７の残量が閾値以上である場合に対応する残量表示ＬＥＤ

が点灯するように所定の信号を送信する。本実施の形態においては、第１コンパレータ２２２ｄの閾値が最も大きい値に設定されており、続いて第２コンパレータ２２２ｅの閾値が第１コンパレータ２２２ｄの閾値よりも小さい値に設定されており、第３コンパレータ２２２ｆの閾値が最も小さい値に設定されている。

【００７９】

例えば、バッテリ５０７の残量が第３コンパレータ２２２ｆの閾値以上であるが、第２コンパレータ２２２ｅおよび第１コンパレータ２２２ｄの閾値以下である場合には、第３残量表示ＬＥＤ２２２ｃのみが点灯することとなる。また、バッテリ５０７の残量が第１コンパレータ２２２ｄ、第２コンパレータ２２２ｅおよび第３コンパレータ２２２ｆ全ての閾値以上である場合には第１残量表示ＬＥＤ２２２ａ、第２残量表示ＬＥＤ２２２ｂおよび第３残量表示ＬＥＤ２２２ｃの全てが点灯する。

【００８０】

バッテリ残量表示部２２２は上述したように残量表示スイッチ２２３を介してバッテリ５０７と接続されている。残量表示スイッチ２２３は上述したようにクレードル１００のクレードル本体２００の底面に設けられており、ユーザにより押下されることによりオンとなりバッテリ５０７と残量表示ＬＥＤとを接続する。これにより、残量表示スイッチ２２３が押下された場合にのみコンパレータによる比較およびバッテリ残量表示部２２２の点灯が行われることとなる。

【００８１】

給電用端子２１１はヘッドセット１の受電用端子３４と接触することによりヘッドセット１に充電電流を供給するためのものである。

【００８２】

充電経路切り替え部５０９は２つのスイッチ、第１切り替えスイッチ５０９ａおよび第２切り替えスイッチ５０９ｂを備えるスイッチ回路として構成されている。第１切り替えスイッチ５０９ａの一端はＵＳＢ端子２２１と接続されており、他端は充電オンオフ切り替え部５１０と接続されている。また、第２切り替えスイッチ５０９ｂの一端はバッテリ５０７と接続されており、他端は充電オンオフ切り替え部５１０と接続されている。さらに、充電経路切り替え部５０９はパラレルＩ／Ｏインターフェース５０５を介して制御部５０１と接続されており、制御部５０１による制御に従って第１切り替えスイッチ５０９ａおよび第２切り替えスイッチ５０９ｂの切り替えが行われる。

【００８３】

充電経路切り替え部５０９は給電用端子２１１を介したヘッドセット１の充電をＵＳＢ端子２２１から供給される充電電流で行うか、バッテリ５０７からの充電電流によって行うかを切り替えるものである。第１切り替えスイッチ５０９ａがＵＳＢ端子２２１により接続された外部電源による充電に対応し、第２切り替えスイッチ５０９ｂがバッテリ５０７による充電に対応している。

【００８４】

なお、ＵＳＢ端子２２１を介して外部電源によって行われる充電が特許請求の範囲における第１の充電手段であり、クレードル１００内に設けられたバッテリ５０７を用いて行われる充電が特許請求の範囲における第２の充電手段に相当するものである。

【００８５】

本実施の形態においては、制御部５０１はＵＳＢインターフェース５０６を介してＵＳＢ端子２２１が外部電源に接続されていることを認識した場合には、第１切り替えスイッチ５０９ａをオンにし、第２切り替えスイッチ５０９ｂをオフにするように制御を行う。これにより、ＵＳＢ端子２２１から供給される充電電流によってヘッドセット１のバッテリ５０７の充電が行われる。一方、ＵＳＢ端子２２１が外部電源に接続されていないと認識した場合にはクレードル１００のバッテリ５０７によってヘッドセット１の充電を行うため、第１切り替えスイッチ５０９ａをオフにし、第２切り替えスイッチ５０９ｂをオンにするように制御が行われる。

【００８６】