

A VERSATILE WIRELESS TELEPHONY SYSTEM USING A PC

FIELD OF THE INVENTION

5 The present invention relates generally to the field of wireless communication, and in particular, to the field of wireless communication using a personal computer.

BACKGROUND OF THE INVENTION

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Wireless audio input devices such as cordless telephones are common everyday devices. Although many of them generally perform their intended functions well, they lack versatility. Today's PCs ("PC" means personal computers, but generically, it can mean any computing apparatus) are an extremely versatile device which are ever increasingly used for different functions. Currently, some PCs are provided with the infrared (IR) and radio frequency (RF) receivers. Virtually all of them can interface with a modem. As of now, these components have not been used to facilitate cordless telephone function and some of the other audio input type of functions taking advantage of the RF and IR receivers, though doing so can allow a great expansion of the their capability such as facilitating easy encryption. This implementation also lowers overall power consumption as well as the cost of implementation. Hence, there is a desirability for having a cordless telephony system which is implemented using a PC which can serve as other audio input devices.

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OBJECT OF THE INVENTION

Hence, it is an object of the present invention to provide a wireless telephony system which is versatile and which can function as other wireless audio input devices.

It is another object of the present invention to provide a wireless telephony system which saves on power consumption and cost of implementation.

SUMMARY OF THE INVENTION

With the above and other objects in mind, the invention provides a versatile wireless telephony system. It comprises a computing apparatus capable of producing sound signals and an RF receiving apparatus coupled with an IR receiving apparatus coupled to said computing apparatus. There is also a modem coupled to the computing apparatus and connectable to a telephone network for receiving and transmitting voice signals. There is at least one speaker coupled to the computing apparatus for outputting a voice of a remote caller with the remote controller having an RF transmitting device and an IR transmitting device coupled to an audio circuit for the sending of IR signals to the IR receiving apparatus according to input from a user input device. The RF transmitting device is for the transmission of RF signals to the RF receiving apparatus. The audio circuit is coupled to a micro-controller with the user input device for providing user input commands to the microcontroller, and a microphone with RF signals being voice signals of a caller speaking into said microphone, the microphone being able to facilitate the freedom of movement for a user.

Advantageously, the remote controller is coupled to the computing apparatus from a position convenient for a user, ensuring ease of use.

Preferably, the microcontroller is used to process the RF and IR signals.

Preferably, the IR signals are in the 38 – 40 KHz modulation scheme.

5 Preferably, the audio circuit is for amplifying the voice signals.

Advantageously, the RF receiving apparatus is coupled to the IR receiving apparatus to form an RF/IR receiver unit. This integrated device is a space-saver.

10 Preferably, the RF receiving apparatus and the IR receiving apparatus are coupled to the micro-controller.

Preferably, the user input device is a keypad with inputs from the keypad being sent to the RF/IR receiver unit as an IR signal.

Preferably, the at least one speaker and the microphone are both coupled by a wireless connection.

15 Preferably, the at least one speaker and the microphone are both coupled by a wired connection.

BRIEF DESCRIPTION OF THE DRAWINGS

20 FIG. 1 illustrates a block diagram of the general system configuration.

FIG. 2 illustrates a general schematic diagram of the present system.

DETAILED DESCRIPTION OF THE INVENTION

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FIG. 1 illustrates a block diagram of the general system configuration which includes a personal computer (PC) 10 having a radio frequency (RF) and infrared (IR) receiver unit 12, a display monitor 14, a set of speakers 16, a wireless microphone 18, and IR remote controller 20 with an RF
30 transmitter. Although here the microphone 18 and the remote controller 20

are shown separately, the two devices can be physically attached⁴ for convenience in usage for the user.

FIG. 2 illustrates a general schematic diagram of the present system. The IR remote controller 20 includes an RF transmitter 21 and an IR transmitter 22, which are coupled to each other and to an audio circuit 23
5 whose main function is to amplify the sound signal received from the microphone. The audio circuit 23 is coupled to a micro-controller 24. A keypad 25 is provided to input commands to the micro-controller 24.

Still referring to FIG. 2, the RF and IR receiver unit 12 includes an RF receiver 26 which is coupled to an IR receiver 27. Both the RF receiver 26 and IR receiver 27 are coupled to a micro-controller 28. The RF receiver 26 is further coupled to a sound system 30 which is coupled to a modem. Both the sound system 30 and the modem are located in the PC 10. A set of speakers 16 is coupled to the sound system 30 which is basically any device or circuitry such as a sound card designed to produce analog sound signals in a PC.

The wireless transmission of audio is based on FM modulation using the frequency range of 88 to 108 MHz. Hence, a 88-108 MHz receiver is used. The function keys of the keypad 25 are implemented using 38-40 KHz modulation scheme. To optimally implement the present invention, the FM transmitter should be relatively stable such that the FM carrier does not drift within a tolerance, and the receiver must be able to lock to the carrier frequency within a pre-defined range. The audio quality should be within the audio specification of the FM modulated audio.

To facilitate the wireless telephony function, the modem needs to be connected to a telephone line and some software should be provided in the PC for handling a call. When a call comes in, the call can be answered using the keypad 25 of the remote controller unit 20 where various functions are assigned to the various keys on the pad. The incoming signal is sent to the speakers 16 where the voice of the incoming caller can be heard. To speak to the incoming caller, a person speaks into the wireless microphone 18. The voice audio is then transmitted by the RF transmitter 21 of the remote controller unit 20 to the RF receiver 26 of the RF/IR

receiver unit 12. The inputs to the keypad 25 are sent to the RF/IR receiver unit 12 as an IR signal while the audio is sent as an RF signal

The present configuration for wireless telephony results in much lower overall power consumption than the traditional wireless telephone systems. As compared to the existing systems which allow for 2 to 3 hours of talk time, the present system can reach near 50 hours of continuous audio transmission. Moreover, the cost of implementation is lower in that many of the generic peripheral devices can be used. In addition, using an encryption software, the telephony communication can be easily encrypted to achieve communication privacy.

The configuration shown here is versatile in that it can facilitate other functions beside telephony. For instance, the audio input can be used to facilitate karaoke function and the keypad can be used to make various karaoke choices. In addition, the remote controller can be used to serve many other functions such as for navigation and media control.

The present invention may be embodied in other specific forms without departing from the spirit or essential characteristics thereof. The presently disclosed embodiments are, therefore, to be considered in all respects as illustrative and not restrictive, the scope of the invention being indicated by the appended claims and all changes which come within the meaning and range of equivalency of the claims are, therefore, to be embraced therein.

CLAIMS

I Claim:

- 5 1. A versatile wireless telephony system comprising:
- i. a computer, including:
 a sound system, capable of producing sound signals, the sound
 system including at least one speaker for outputting a voice of a
10 remote caller and being coupled to a modem; the modem being
 connectable to a telephone network for receiving and transmitting
 voice signals;
 an RF receiving apparatus;
 an IR receiving apparatus; and
- 15 ii. a remote controller, said remote controller including:
 an RF transmitting device, the RF transmitting device being for the
 transmission of RF signals to the RF receiving apparatus, and
 an IR transmitting device for the transmission of IR signals to the IR
20 receiving apparatus,
 both being coupled to an audio circuit,
 said IR receiving apparatus acting according to input from a user
 input device the audio circuit being coupled to a micro-controller; the
 user input device being for providing user input commands to the
25 microcontroller, the input commands being sent by the remote
 controller to the IR receiving apparatus as an IR signal; and
 a microphone, said RF signals being voice signals of a caller
 speaking into said microphone, said microphone being able to
 facilitate the freedom of movement for a user.
- 30 2. The apparatus as claimed in claim 1, wherein the remote controller is
 coupled to the computing apparatus from a position convenient for a user.

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3. The apparatus as claimed in any one of claims 1 to 2, wherein the microcontroller is used to process the RF and IR signals.
 4. The apparatus as claimed in any one of claims 1 to 3, wherein the IR signals are in the 38 – 40 KHz modulation scheme.
 5. The apparatus as claimed in any one of claims 1 – 4, wherein the audio circuit is for amplifying the voice signals.
 - 10 6. The apparatus as claimed in any one of claims 1 – 5, wherein the RF receiving apparatus is coupled to the IR receiving apparatus to form an RF/IR receiver unit.
 - 15 7. The apparatus as claimed in claim 6, wherein the RF receiving apparatus and the IR receiving apparatus are coupled to the microcontroller.
 - 20 8. The apparatus as claimed in claim 6, wherein the user input device is a keypad, inputs from the keypad being sent to the RF/IR receiver unit as an IR signal.
 9. The apparatus as claimed in any one of claims 1 to 8, wherein the at least one speaker and the microphone are both coupled by a wireless connection.
 - 25 10. The apparatus as claimed in any one of claims 1 to 8, wherein the at least one speaker and the microphone are both coupled by a wired connection.