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Wireless Headphones and Data Transmission Method

The present invention relates to wireless headphones, a wireless microphone, a wireless headset, and a method for data transmission.

Distribution of digitally compressed music, e.g. as MP3 files, has increased considerably in recent years. Audio files are digitalized and then stored, e.g. on a hard drive in a computer. As a result, computers are increasingly used as music sources in the private sector, where the computer is used to play the audio files stored thereon. This allows for a hardwired music playback, and if the computer contains a radio signal interface, it is possible to play the music wirelessly, or to transmit the audio files or audio signals through radio signals. Furthermore, there are also music sources connected to the internet, which provide audio files for free or for a fee. A user can download these audio files to a computer via the internet, and subsequently listen to these audio files. A user can also access the internet with a cellular telephone or PDA through HSCSD, GPRS, UMTS, etc. to likewise download audio files. One disadvantage with this is that a large amount of data frequently needs to be transferred at a low speed.

A PDA or a notebook with a WLAN interface (IEEE 802.11) can likewise access the internet wirelessly, as long as the PDA or notebook is located within the transmission range of a WLAN access point. This is particularly advantageous with regard to the data transfer speed in comparison with a cellular telephone connection.

1 DE 20 2004 005 111 U1 discloses wireless Bluetooth headphones that has an  
2 electroacoustic transducer and a transmitter/receiver unit for wireless signal reception of  
3 audio signals.

4  
5 DE 101 14 670 A1 discloses a mobile multimedia device that contains one  
6 transmitter/receiver unit for communicating with a cellular network and second  
7 transmitter/receiver unit for receiving radio frequencies. Reception authorization  
8 received via the first transmitter/receiver unit is stored in a transmitter. The multimedia  
9 device also contains a decoder for decoding the encoded multimedia content received  
10 via the second transmitter/receiver unit. An authorization query for multimedia content  
11 is transmitted wirelessly via the first transmitter.

12  
13 The downloading of data, in particular audio files, from the internet described above  
14 may involve copyright laws.

15  
16 It is therefore the object of the present invention to enable mobile access to data stored  
17 in an internet server that does not infringe on copyright laws. It is also the object of the  
18 present invention to create wireless headphones, a wireless microphone, and a wireless  
19 headset that enable improved access to existing or available communication  
20 environments.

21  
22 The invention relates to the idea of providing WLAN headphones or a WLAN receiver  
23 with a headphone connection for wireless audio file transfer, as long as the receiver is  
24 within the transmission range of a WLAN access point, for example. This involves  
25 establishing a connection between the headphones or receiver and a server and/or  
26 server service that supports the client functionalities. The server and/or server service  
27 can be a private server/service or an external server/service, for which the connection  
28 data are known, and for which the user has access rights. More precisely, a connection  
29 is established between the access point and the server or server service that contains  
30 the data that are to be downloaded, which can be hardwired or partially or entirely  
31 wireless. The data are then transferred from the access point to the headphones or

1 receiver via a WLAN interface (e.g. IEEE 802.11). This enables it to receive its own  
2 digitally stored music wirelessly within the transmission range of a WLAN access point.  
3 Because it is accessing its own music, a continuous verification of rights is enabled,  
4 such that it is not subject to copyright restrictions. WLAN headphones or a WLAN  
5 receiver can access their own data in the same manner, regardless of whether the  
6 headphones or receiver are within the transmission range of a private WLAN access  
7 point or a public WLAN access point.

8  
9 It is not necessarily essential for a data medium to physically possess the audio data for  
10 an authorized access to its own audio data. Audio data that can be accessed in the  
11 allowed manner as set forth in this invention can be privately owned music data media,  
12 or it can be audio data that have been downloaded from an internet service, potentially  
13 for a fee, or it can be audio data copied to a specific server/service, potentially for a fee,  
14 from which it can then be retrieved as desired. In particular, the non-physical purchase  
15 of audio data should be noted in conjunction with this invention.

16  
17 It may be the case that the necessary storage space in the private sector is insufficient  
18 for storing all of the audio data. An internet service or provider that stores this data and  
19 can be accessed in the conventional manner is also conceivable. This service may also  
20 involve fees, or it may be included in other service contracts.

21  
22 The invention also relates to the concept of configuring headphones not only as passive  
23 audio receivers, but also as an active network element, or as a web client that provides  
24 an internet service such that other network elements can likewise access it. The same  
25 applies for a microphone and for the headset.

26  
27 This results in wireless headphones that have at least one electroacoustic transducer  
28 and a transmitter/receiver unit for wireless reception of first signals, which contain audio  
29 signals that can be played back on the electroacoustic transducer, and a network  
30 identification unit for storing a network ID for the wireless headphones, wherein the  
31 transmitter/receiver unit is configured for wireless transmission of the network ID for the

1 headphones, wherein the network ID for the wireless headphones stored in the network  
2 identification unit represents an internet protocol address.

3

4 As a result, the wireless headphones form not only a passive receiver for audio signals,  
5 but also an active network element. This ensures that the wireless headphones can be  
6 clearly identified in a network. The wireless headphones can be accessed via the  
7 internet using IP address, i.e. the wireless headphones can be addressed worldwide.

8

9 According to another aspect of the present invention, the IP address is assigned to a  
10 network element in a wireless network in which the wireless headphones are located.

11

12 According to another aspect of the present invention, the headphones contain a buffer  
13 for temporarily storing the received signals. Brief interruptions in the reception of the  
14 first signals can be bridged with such a buffer, without having to stop playback of the  
15 audio signals via the electroacoustic transducer. The buffer can be a component of the  
16 streaming protocol, or it can be formed in the application software as a supplement to  
17 the streaming protocol.

18

19 According to another aspect of the present invention, the wireless headphones have a  
20 display for displaying second signals that have been received by the transmitter/receiver  
21 unit along with the first signals. As a result, supplementary information, e.g. a title and  
22 performer of a piece of music, can be displayed on the display.

23

24 According to another aspect of the present invention, the wireless headphones have  
25 control buttons. The user can use these control buttons to control the display and  
26 communicate with other network elements in the network. The user can thus select  
27 audio files stored on a server in the network, such that they can be transferred to the  
28 wireless headphones for playback.

29

1 The invention likewise relates to a wireless microphone that has an electroacoustic  
2 transducer for picking up audio signals and a transmitter/receiver unit for the wireless  
3 transfer of these audio signals.

4  
5 The wireless microphone also contains a network identification unit for storing a network  
6 ID for the wireless microphone. The transmitter/receiver unit also transmits the network  
7 ID for the microphone stored in the network identification unit. As a result, a wireless  
8 microphone is provided that is not only a passive transmitter for audio signals, but is  
9 also used as an active network element, thus making an internet service available.

10

11 The invention also relates to a wireless headset that contains at least one first  
12 electroacoustic transducer for playing audio signals, and a second electroacoustic  
13 transducer for recording audio signals. The headset also contains a transmitter/receiver  
14 unit for wireless transmission and reception, as well as a network identification unit for  
15 storing a network ID for the headset. The network ID for the headset is transmitted  
16 wirelessly by the transmitter/receiver unit.

17

18 Further embodiments of the invention are the subject matter of the dependent claims.

19

20 The invention shall be described in greater detail below in reference to the drawings.

21 Therein:

22

23 Fig. 1 shows a fundamental construction of a data transfer system according to  
24 the invention;

25

26 Fig. 2 shows a playback device according to a first exemplary embodiment;

27

28 Fig. 3 shows a playback device according to a second exemplary embodiment;

29

30 Fig. 4 shows a block diagram of a multimedia network;

31

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