Continuation from U.S. Patent Application No.: 10/648,012

Attorney Docket No.: 1028.2

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

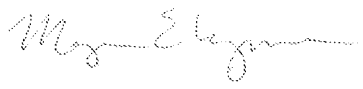
In re Application of:	:	Art Unit: 2615
C. Earl Woolfork	:	
	:	
	:	
For: WIRELESS DIGITAL AUDIO SYSTEM	:	Customer No.: 68533
	:	

COVER LETTER FOR TRANSMITTAL OF CONTINUATION APPLICATION

Dear Sir:

The Applicant respectfully submits this continuation application that claims benefit of U.S. Patent Application No.: 10/648,012, filed August 26, 2003 which claimed benefit of U.S. Patent Application No. 10/027,391, filed December 21, 2001, now abandoned. Transmitted herewith please find the specification; claims; drawings; application data sheet; a copy of the previously filed declaration in Application No. 10/648,012; and the required fees. Any overpayment or underpayment of fees associated with this filing are authorized to be charged to Deposit Acct. No. 50-4576.

Best Regards,



Megan Lyman, Reg. No. 57,054

PTO/SB/14 (07-07)
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Application Data Sheet 37 CFR 1.76	Attorney Docket Number	1028.2
	Application Number	
Title of Invention	Wireless Digital Audio Music System	

The application data sheet is part of the provisional or nonprovisional application for which it is being submitted. The following form contains the bibliographic data arranged in a format specified by the United States Patent and Trademark Office as outlined in 37 CFR 1.76.
This document may be completed electronically and submitted to the Office in electronic format using the Electronic Filing System (EFS) or the document may be printed and included in a paper filed application.

Secrecy Order 37 CFR 5.2

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

Applicant Information:

Applicant 1 Remove

Applicant Authority ◉ Inventor ○ Legal Representative under 35 U.S.C. 117 ○ Party of Interest under 35 U.S.C. 118

Prefix	Given Name	Middle Name	Family Name	Suffix
Mr.	Cedric	Earl	Woolfork	

Residence Information (Select One) ◉ US Residency ○ Non US Residency ○ Active US Military Service

City	Pasadena	State/Province	CA	Country of Residence [i]	US

Citizenship under 37 CFR 1.41(b) [i]

Mailing Address of Applicant:

Address 1	500 Santa Paula Ave.		
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City	Pasadena	State/Province	CA
Postal Code	91107	Country [i]	US

All Inventors Must Be Listed - Additional Inventor Information blocks may be generated within this form by selecting the **Add** button. Add

Correspondence Information:

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

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

Customer Number	68533		
Email Address	melyman@lymanpatents.com	Add Email	Remove Email

Application Information:

Title of the Invention	Wireless Digital Audio Music System		
Attorney Docket Number	1028.2	Small Entity Status Claimed	☒
Application Type	Nonprovisional		
Subject Matter	Utility		
Suggested Class (if any)	375	Sub Class (if any)	
Suggested Technology Center (if any)	2615		
Total Number of Drawing Sheets (if any)	3	Suggested Figure for Publication (if any)	1

SONY EXHIBIT 1007 – 0002
Samsung Exhibit 1007, Page 2 of 25
Samsung Electronics Co., Ltd. et al. v. One-E-Way, Inc.
IPR2025-01541

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Title of Invention	Wireless Digital Audio Music System	

Publication Information:

☐ Request Early Publication (Fee required at time of Request 37 CFR 1.219)
☐ **Request Not to Publish.** I hereby request that the attached application not be published under 35 U.S. C. 122(b) and certify that the invention disclosed in the attached application **has not and will not** be the subject of an application filed in another country, or under a multilateral international agreement, that requires publication at eighteen months after filing.

Representative Information:

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

Please Select One:	◉ Customer Number	○ US Patent Practitioner	○ Limited Recognition (37 CFR 11.9)
Customer Number	68533		

Domestic Benefit/National Stage Information:

This section allows for the applicant to either claim benefit under 35 U.S.C. 119(e), 120, 121, or 365(c) or indicate National Stage entry from a PCT application. Providing this information in the application data sheet constitutes the specific reference required by 35 U.S.C. 119(e) or 120, and 37 CFR 1.78(a)(2) or CFR 1.78(a)(4), and need not otherwise be made part of the specification.

Prior Application Status	Pending		Remove
Application Number	Continuity Type	Prior Application Number	Filing Date (YYYY-MM-DD)
	Continuation of	10648012	2003-08-26
Prior Application Status	Abandoned		Remove
Application Number	Continuity Type	Prior Application Number	Filing Date (YYYY-MM-DD)
10648012	Continuation in part of	10027391	2001-12-21

Additional Domestic Benefit/National Stage Data may be generated within this form by selecting the **Add** button. Add

Foreign Priority Information:

This section allows for the applicant to claim benefit of foreign priority and to identify any prior foreign application for which priority is not claimed. Providing this information in the application data sheet constitutes the claim for priority as required by 35 U.S.C. 119(b) and 37 CFR 1.55(a).

Remove

Application Number	Country [i]	Parent Filing Date (YYYY-MM-DD)	Priority Claimed
			○ Yes ◉ No

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SONY EXHIBIT 1007 – 0003
Samsung Exhibit 1007, Page 3 of 25
Samsung Electronics Co., Ltd. et al. v. One-E-Way, Inc.
IPR2025-01541

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Application Data Sheet 37 CFR 1.76	Attorney Docket Number	1028.2
	Application Number	
Title of Invention	Wireless Digital Audio Music System	

Assignee Information:

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

Assignee 1 Remove

If the Assignee is an Organization check here. ☐

Prefix	**Given Name**	Middle Name	**Family Name**	Suffix

Mailing Address Information:

Address 1			
Address 2			
City		**State/Province**	
Country [i]		Postal Code	
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Email Address			

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

Signature:

A signature of the applicant or representative is required in accordance with 37 CFR 1.33 and 10.18. Please see 37 CFR 1.4(d) for the form of the signature.

Signature	/Megan Lyman/			Date (YYYY-MM-DD)	2008-06-24
First Name	Megan	Last Name	Lyman	Registration Number	57054

This collection of information is required by 37 CFR 1.76. The information is required to obtain or retain a benefit by the public which is to file (and by the USPTO to process) an application. Confidentiality is governed by 35 U.S.C. 122 and 37 CFR 1.14. This collection is estimated to take 23 minutes to complete, including gathering, preparing, and submitting the completed application data sheet form to the USPTO. Time will vary depending upon the individual case. Any comments on the amount of time you require to complete this form and/or suggestions for reducing this burden, should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, U.S. Department of Commerce, P.O. Box 1450, Alexandria, VA 22313-1450. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. **SEND TO: Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450.**

SONY EXHIBIT 1007 – 0004
Samsung Exhibit 1007, Page 4 of 25
Samsung Electronics Co., Ltd. et al. v. One-E-Way, Inc.
IPR2025-01541

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7. A record from this system of records may be disclosed, as a routine use, to the Administrator, General Services, or his/her designee, during an inspection of records conducted by GSA as part of that agency's responsibility to recommend improvements in records management practices and programs, under authority of 44 U.S.C. 2904 and 2906. Such disclosure shall be made in accordance with the GSA regulations governing inspection of records for this purpose, and any other relevant (i.e., GSA or Commerce) directive. Such disclosure shall not be used to make determinations about individuals.

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SONY EXHIBIT 1007 – 0005

Samsung Exhibit 1007, Page 5 of 25
Samsung Electronics Co., Ltd. et al. v. One-E-Way, Inc.
IPR2025-01541

WIRELESS DIGITAL AUDIO MUSIC SYSTEM

This continuation application claims the benefit of U.S. Patent Application Serial No. 10/648,012 filed August 26, 2003, which claimed benefit from from U.S. Patent Application Serial No. 10/027,391, filed December 21, 2001, for "Wireless Digital Audio System," published under US 2003/0118196 A1 on June 26, 2003, now abandoned, both of which are incorporated herein in their entirety by reference.

BACKGROUND OF THE INVENTION

[0001] This invention relates to audio player devices and more particularly to systems that include headphone listening devices. The new audio system uses an existing headphone jack (i.e., this is the standard analog headphone jack that connects to wired headphones) of a music audio player (i.e., portable CD player, portable cassette player, portable A.M./F.M. radio, laptop/desktop computer, portable MP3 player, and the like) to connect a battery powered transmitter for wireless transmission of a signal to a set of battery powered receiving headphones.

[0002] Use of audio headphones with audio player devices such as portable CD players, portable cassette players, portable A.M./F.M. radios, laptop/desktop computers, portable MP3 players and the like have been in use for many years. These systems incorporate an audio source having an analog headphone jack to which headphones may be connected by wire.

[0003] There are also known wireless headphones that may receive A.M. and F.M. radio transmissions. However, they do not allow use of a simple plug in (i.e., plug in to the existing analog audio headphone jack) battery powered transmitter for connection to any music audio player device jack, such as the above mentioned music audio player devices, for coded wireless transmission and reception by headphones of audio music for private listening without interference where multiple users occupying the same space are operating wireless transmission devices. Existing audio systems make use of electrical wire connections between the audio source and the headphones to accomplish private listening to multiple users.

SONY EXHIBIT 1007 – 0006
Samsung Exhibit 1007, Page 6 of 25
Samsung Electronics Co., Ltd. et al. v. One-E-Way, Inc.
IPR2025-01541

[0004] There is a need for a battery powered simple connection system for existing music audio player devices (i.e., the previously mentioned music devices), to allow coded digital wireless transmission (using a battery powered transmitter) to a headphone receiver (using a battery powered receiver headphones) that accomplishes private listening to multiple users occupying the same space without the use of wires.

SUMMARY OF THE INVENTION

[0005] The present invention is generally directed to a wireless digital audio system for coded digital transmission of an audio signal from any audio player with an analog headphone jack to a receiver headphone located away from the audio player. Fuzzy logic technology may be utilized by the system to enhance bit detection. A battery-powered digital transmitter may include a headphone plug in communication with any suitable music audio source. For reception, a battery-powered headphone receiver may use embedded fuzzy logic to enhance user code bit detection. Fuzzy logic detection may be used to enhance user code bit detection during decoding of the transmitted audio signal. The wireless digital audio music system provides private listening without interference from other users or wireless devices and without the use of conventional cable connections.

[0006] These and other features, aspects and advantages of the present invention will become better understood with reference to the following drawings, description and claims.

BRIEF DESCRIPTION OF THE DRAWINGS

[0007] Some aspects of the present invention are generally shown by way of reference to the accompanying drawings in which:

Figure 1 schematically illustrates a wireless digital audio system in accordance with the present invention;

SONY EXHIBIT 1007 – 0007
Samsung Exhibit 1007, Page 7 of 25
Samsung Electronics Co., Ltd. et al. v. One-E-Way, Inc.
IPR2025-01541

Figure 2 is a block diagram of an audio transmitter portion of the wireless digital audio system of Fig. 1.;

Figure 3 is a block diagram of an audio receiver portion of the wireless digital audio system of Fig. 1; and

Figure 4 is an exemplary graph showing the utilization of an embedded fuzzy logic coding algorithm according to one embodiment of the present invention.

DETAILED DESCRIPTION

[0008] The following detailed description is the best currently contemplated modes for carrying out the invention. The description is not to be taken in a limiting sense, but is made merely for the purpose of illustrating the general principles of the invention.

[0009] Referring to Figures 1 through 3, a wireless digital audio music system 10 may include a battery powered transmitter 20 connected to a portable music audio player or music audio source 80. The battery powered wireless digital audio music transmitter 20 utilizes an analog to digital converter or ADC 32 and may be connected to the music audio source 80 analog headphone jack 82 using a headphone plug 22. The battery powered transmitter 20 may have a transmitting antenna 24 that may be omni-directional for transmitting a spread spectrum modulated signal to a receiving antenna 52 of a battery powered headphone receiver 50. The battery powered receiver 50 may have headphone speakers 75 in headphones 55 for listening to the spread spectrum demodulated and decoded communication signal. In the headphone receiver 50, fuzzy logic detection may be used to optimize reception of the received user code. The transmitter 20 may digitize the audio signal using ADC 32. The digitized signal may be processed downstream by an encoder 36. After digital conversion, the digital signal may be processed by a digital low pass filter. To reduce the effects of channel noise, the battery powered transmitter 20 may use a channel encoder 38. A modulator 42 modulates the digital signal to be transmitted. For further noise immunity, a spread spectrum DPSK (differential phase shift key) transmitter or module 48, is utilized. The battery powered transmitter 20 may

SONY EXHIBIT 1007 – 0008
Samsung Exhibit 1007, Page 8 of 25
Samsung Electronics Co., Ltd. et al. v. One-E-Way, Inc.
IPR2025-01541

contain a code generator 44 that may be used to create a unique user code. The unique user code generated is specifically associated with one wireless digital audio system user, and it is the only code recognized by the battery powered headphone receiver 50 operated by a particular user. The radio frequency (RF) spectrum utilized (as taken from the Industrial, Scientific and Medical (ISM) band) may be approximately 2.4 GHz. The power radiated by the transmitter adheres to the ISM standard.

[0010] Particularly, the received spread spectrum signal may be communicated to a 2.4 GHz direct conversion receiver or module 56. Referring to Figures 1 through 4, the spread spectrum modulated signal from transmit antenna 24 may be received by receiving antenna 52 and then processed by spread spectrum direct conversion receiver or module 56 with a receiver code generator 60 that contains the same transmitted unique code, in the battery powered receiver 50 headphones. The transmitted signal from antenna 24 may be received by receiving antenna 52 and communicated to a wideband bandpass filter (BPF). The battery powered receiver 50 may utilize embedded fuzzy logic 61 (as graphically depicted in Figures 1, 4) to optimize the bit detection of the received user code. The down converted output signal of direct conversion receiver or module 56 may be summed by receiver summing element 58 with a receiver code generator 60 signal. The receiver code generator 60 may contain the same unique wireless transmission of a signal code word that was transmitted by audio transmitter 20 specific to a particular user. Other code words from wireless digital audio systems 10 may appear as noise to audio receiver 50. This may also be true for other device transmitted wireless signals operating in the wireless digital audio spectrum of digital audio system 10. This code division multiple access (CDMA) may be used to provide each user independent audible enjoyment. The resulting summed digital signal from receiving summary element 58 and direct conversion receiver or module 56 may be processed by a 64-Ary demodulator 62 to demodulate the signal elements modulated in the audio transmitter 20. A block de-interleaver 64 may then decode the bits of the digital signal encoded in the block interleaver 40. Following such, a Viterbi decoder 66 may be used to decode the bits encoded by the channel encoder 38 in audio transmitter 20. A source decoder 68 may further decode the coding applied by encoder 36.

SONY EXHIBIT 1007 – 0009
Samsung Exhibit 1007, Page 9 of 25
Samsung Electronics Co., Ltd. et al. v. One-E-Way, Inc.
IPR2025-01541

[0011] Each receiver headphone 50 user may be able to listen (privately) to high fidelity audio music, using any of the audio devices listed previously, without the use of wires, and without interference from any other receiver headphone 50 user, even when operated within a shared space. The fuzzy logic detection technique 61 used in the receiver 50 could provide greater user separation through optimizing code division in the headphone receiver.

[0012] The battery powered transmitter 20 sends the audio music information to the battery powered receiver 50 in digital packet format. These packets may flow to create a digital bit stream rate less than or equal to 1.0 Mbps.

[0013] The user code bits in each packet may be received and detected by a fuzzy logic detection sub-system 61 (as an option) embedded in the headphone receiver 50 to optimize audio receiver performance. For each consecutive packet received, the fuzzy logic detection sub-system 61 may compute a conditional density with respect to the context and fuzziness of the user code vector, i.e., the received code bits in each packet. Fuzziness may describe the ambiguity of the high (1)/low (0 or -1) event in the received user code within the packet. The fuzzy logic detection sub-system 61 may measure the degree to which a high/low bit occurs in the user code vector, which produces a low probability of bit error in the presence of noise. The fuzzy logic detection sub-system 61 may use a set of if-then rules to map the user code bit inputs to validation outputs. These rules may be developed as if-then statements.

[0014] Fuzzy logic detection sub-system 61 in battery-powered headphone receiver 50 utilizes the if-then fuzzy set to map the received user code bits into two values: a low (0 or -1) and a high (1). Thus, as the user code bits are received, the "if" rules map the signal bit energy to the fuzzy set low value to some degree and to the fuzzy set high value to some degree. Figure 4 graphically shows that x-value -1 equals the maximum low bit energy representation and x-value 1 equals the maximum high bit energy representation. Due to additive noise, the user code bit energy may have some membership to a low and high as represented in Figure 4. The if-part fuzzy set may determine if each bit in the user code, for every received packet, has a greater membership to a high bit representation or a low bit representation. The more a user code bit energy fits into the

SONY EXHIBIT 1007 – 0010
Samsung Exhibit 1007, Page 10 of 25
Samsung Electronics Co., Ltd. et al. v. One-E-Way, Inc.
IPR2025-01541

high or low representation, the closer its subsethood, i.e., a measure of the membership degree to which a set may be a subset of another set, may be to one.

[0015] The if-then rule parts that make up the fuzzy logic detection sub-system 61 must be followed by a defuzzifying operation. This operation reduces the aforementioned fuzzy set to a bit energy representation (i.e., -1 or 1) that is received by the transmitted packet. Fuzzy logic detection sub-system 61 may be used in battery-powered headphone receiver 50 to enhance overall system performance.

[0016] The next step may process the digital signal to return the signal to analog or base band format for use in powering speaker(s) 75. A digital-to-analog converter 70 (DAC) may be used to transform the digital signal to an analog audio signal. An analog low pass filter 72 may be used to filter the analog audio music signal to pass a signal in the approximate 20 Hz to 20 kHz frequency range and filter other frequencies. The analog audio music signal may then be processed by a power amplifier 74 that may be optimized for powering headphone speakers 75 to provide a high quality, low distortion audio music for audible enjoyment by a user wearing headphones 55. A person skilled in the art would appreciate that some of the embodiments described hereinabove are merely illustrative of the general principles of the present invention. Other modifications or variations may be employed that are within the scope of the invention. Thus, by way of example, but not of limitation, alternative configurations may be utilized in accordance with the teachings herein. Accordingly, the drawings and description are illustrative and not meant to be a limitation thereof.

[0017] Moreover, all terms should be interpreted in the broadest possible manner consistent with the context. In particular, the terms "comprises" and "comprising" should be interpreted as referring to elements, components, or steps in a non-exclusive manner, indicating that the referenced elements, components, or steps may be present, or utilized, or combined with other elements, components, or steps that are not expressly referenced. Thus, it is intended that the invention cover all embodiments and variations thereof as long as such embodiments and variations come within the scope of the appended claims and their equivalents.

SONY EXHIBIT 1007 – 0011
Samsung Exhibit 1007, Page 11 of 25
Samsung Electronics Co., Ltd. et al. v. One-E-Way, Inc.
IPR2025-01541

ABSTRACT

[0018] A wireless digital audio system includes a portable audio source with a digital audio transmitter operatively coupled thereto and an audio receiver operatively coupled to a headphone set. The audio receiver is configured for digital wireless communication with the audio transmitter. The digital audio receiver utilizes fuzzy logic to optimize digital signal processing. Each of the digital audio transmitter and receiver is configured for code division multiple access (CDMA) communication. The wireless digital audio system allows private audio enjoyment without interference from other users of independent wireless digital transmitters and receivers sharing the same space.

SONY EXHIBIT 1007 – 0012
Samsung Exhibit 1007, Page 12 of 25
Samsung Electronics Co., Ltd. et al. v. One-E-Way, Inc.
IPR2025-01541

CLAIMS

I claim:

1. A method for wireless digital audio transmission and reception of at least one audio source between at least one digital portable audio transmitter and at least one portable audio receiver comprising the steps of:

operatively coupling the digital portable audio transmitter to said at least one audio source, the digital portable audio transmitter comprising:

a first analog low pass filter receiving audio output from said at least one audio source;

a digital low pass filter;

an analog-to-digital converter (ADC) operatively coupled between the first analog and the digital low pass filter;

a first encoder receiving output from the digital low pass filter and being configured to reduce intersymbol interference (ISI);

a second channel encoder operatively coupled to the first encoder and adapted to reduce transmission errors;

a digital modulator operatively coupled to the second channel encoder; and

a differential phase shift key (DPSK) module receiving output from the digital modulator and a unique user code and being configured for direct sequence spread spectrum (DSSS) communication, said DPSK module transmitting a corresponding DSSS signal;

converting the audio output to a digital communication signal;

encoding the digital communication signal;

filtering the digital communication signal;

creating the DSSS signal;

transmitting the DSSS signal to said at least one portable audio receiver configured for digital wireless communication from said at least one portable digital audio transmitter and utilizing an embedded fuzzy logic detector wherein the fuzzy logic detector activates fuzzy logic rules and performs a defuzzification operation in response to a received user code in said transmitted DSSS signal, said at least one portable audio receiver comprising:

SONY EXHIBIT 1007 – 0013
Samsung Exhibit 1007, Page 13 of 25
Samsung Electronics Co., Ltd. et al. v. One-E-Way, Inc.
IPR2025-01541

a band pass filter (BPF) configured to process said transmitted DSSS signal;

a direct conversion module to receive output from said BPF and being configured to capture the correct bit sequence embedded in said processed DSSS signal;

a digital demodulator adapted to process output from said direct conversion module;

a Viterbi decoder operatively coupled to said digital demodulator to generate a corresponding digital output;

a source decoder to process said digital output from said Viterbi decoder and being configured to decode the digital signal encoded by said first encoder;

a second analog low pass filter; and

a digital-to-analog converter (DAC) operatively coupled between said source decoder and said second analog low pass filter, said second analog low pass filter to generate the audio output; and

at least one module adapted to reproduce said amplified audio output, if the unique user code is recognized;

receiving said DSSS signal at said at least one portable audio receiver;

demodulating said DSSS signal;

demodulating said digital communication signal;

filtering said digital communication signal;

channel decoding said digital communication signal;

converting said digital communication signal to an audio output; and

communicating the audio output to said at least one portable audio receiver, said audio output having been wirelessly transmitted from said at least one audio source to a user privately without interference from other users or wireless devices when operated in a shared space containing at least one other users of wireless devices utilizing code division multiple access (CDMA) communication.

2. The method for wireless digital audio transmission and reception of an audio output of Claim 1, wherein said BPF is a wideband BPF.

3. The method for wireless digital audio transmission and reception of an audio

SONY EXHIBIT 1007 – 0014
Samsung Exhibit 1007, Page 14 of 25
Samsung Electronics Co., Ltd. et al. v. One-E-Way, Inc.
IPR2025-01541

output of Claim 1, wherein said modulator is a 64-Ary modulator.

4. The method for wireless digital audio transmission and reception of an audio output of Claim 1, wherein said demodulator is a 64-Ary demodulator.

5. The method for wireless digital audio transmission and reception of an audio output of Claim 1, wherein said generated audio output is in the approximate range of 20 Hz to 20 kHz.

6. The method for wireless digital audio transmission and reception of an audio output of Claim 1, wherein said spread spectrum signal is transmitted at about 2.4 GHz via an omni-directional antenna.

7. The method for wireless digital audio transmission and reception of an audio output of Claim 6, wherein said spread spectrum signal is transmitted at a power of about 100 milliwatts or less.

8. The method for wireless digital audio transmission and reception of an audio output of Claim 1, wherein said ADC is a 4-bit analog-to-digital converter.

9. The method for wireless digital audio transmission and reception of an audio output of Claim 1, wherein said BPF is operatively coupled to at least one antenna configured to receive said transmitted DSSS signal.

10. The method for wireless digital audio transmission and reception of an audio output of Claim 1, wherein a user employing said method is running, walking, cycling, swimming, or in motion by virtue of attachment to a personal moving device.

11. A wireless digital audio system, comprising:

an audio source to provide an audio signal, said audio source having an existing analog headphone jack;

SONY EXHIBIT 1007 – 0015
Samsung Exhibit 1007, Page 15 of 25
Samsung Electronics Co., Ltd. et al. v. One-E-Way, Inc.
IPR2025-01541

a portable transmitter coupled to said audio source via said analog headphone jack and operative to transmit a code division multiple access (CDMA) communication signal having said audio signal representative of said audio signal and adding a unique user code associated with only said audio signal provided by said audio source; and

an audio receiver operative to receive the CDMA communication signal and utilizing an embedded fuzzy logic detector wherein the fuzzy logic detector activates fuzzy logic rules and performs a defuzzification operation in response to the received unique user code to enhance detection of the unique user code wherein if the unique user code is recognized, the transmitted audio signal is reproduced, providing a user of said portable transmitter and said audio receiver with private audio reproduction of said audio signal provided by said audio source free from interference when operated in a shared space containing at least one other user of wireless devices utilizing code division multiple access (CDMA) communication and utilizing an independent portable transmitter and audio receiver.

12. A wireless digital audio system, comprising:

an audio source to provide an audio signal, said audio source having an existing analog headphone jack;

a portable transmitter coupled to said audio source via said analog headphone jack and operative to transmit a code division multiple access (CDMA) communication signal having a differential phase shift keying (DPSK) modulated signal of said audio signal and an adding a unique user code associated with only said audio signal provided by said audio source; and

an audio receiver operative to receive the CDMA communication signal and utilizing an embedded fuzzy logic detector wherein the fuzzy logic detector activates fuzzy logic rules and performs a defuzzification operation in response to the received unique user code that to enhance detection of the unique user code wherein if the unique user code is recognized, the transmitted audio signal is reproduced, providing a user of said portable transmitter and said audio receiver with private audio reproduction of said audio signal provided by said audio source virtually free from interference when operated

SONY EXHIBIT 1007 – 0016
Samsung Exhibit 1007, Page 16 of 25
Samsung Electronics Co., Ltd. et al. v. One-E-Way, Inc.
IPR2025-01541

in a shared space containing at least one other user of wireless devices utilizing code division multiple access (CDMA) communication and utilizing an independent portable transmitter and audio receiver in a shared space.

13. The wireless digital audio system of Claim 11, wherein said at least one audio source provides analog output in the approximate range of 20 Hz to 20 kHz.

14. The wireless digital audio system of Claim 12, wherein said at least one audio source provides analog output in the approximate range of 20 Hz to 20 kHz.

15. A wireless digital audio receiver comprising:

an embedded fuzzy logic detector wherein the fuzzy logic detector activates fuzzy logic rules and performs a defuzzification operation in response to a received unique user code to enhance detection of the unique user code;

a band pass filter (BPF) configured to process a transmitted DSSS signal;

a direct conversion module receiving output from said BPF and being configured to capture a the correct unique user code bit sequence embedded in the received DSSS signal;

a digital demodulator adapted to process output from said direct conversion module;

a Viterbi decoder operatively coupled to said digital demodulator and generating a corresponding digital output;

a source decoder receiving said digital output from said Viterbi decoder and being configured to decode the digital signal encoded therein;

a second analog low pass filter; and

a digital-to-analog converter (DAC) operatively coupled between said source decoder and said second analog low pass filter, said second analog low pass filter generating an audio output wherein if the unique user code bit sequence corresponding to the decoded and converted digital signal is recognized, said audio output having been

SONY EXHIBIT 1007 – 0017
Samsung Exhibit 1007, Page 17 of 25
Samsung Electronics Co., Ltd. et al. v. One-E-Way, Inc.
IPR2025-01541

wirelessly transmitted, said audio output reproduced without interference when operated in a shared space containing at least one other user of a wireless device utilizing code division multiple access (CDMA) communication.

16. A method for listening to an audio output with a wireless digital audio system while running comprising the steps of:

activating said wireless digital audio system while running, said wireless digital audio system, comprising:

a portable transmitter coupled to an audio source via said analog headphone jack and operative to transmit a code division multiple access (CDMA) communication signal having a differential phase shift keying (DPSK) modulated signal of an audio output and an adding a unique user code to maintain fidelity of said audio output; and

an audio receiver operative to receive the CDMA communication signal and utilizing an embedded fuzzy logic detector wherein the fuzzy logic detector activates fuzzy logic rules and performs a defuzzification operation in response to the received unique user code that to enhance detection of the unique user code, wherein if the unique user code is recognized, the transmitted audio signal is reproduced, providing a user of said portable transmitter and said audio receiver with private audio reproduction of said audio signal virtually free from interference when operated in a shared space containing at least one other user of a wireless device utilizing an independent portable transmitter and audio receiver; and

listening to said audio output free from interference from at least one other user of a wireless devices in a shared space.

SONY EXHIBIT 1007 – 0018
Samsung Exhibit 1007, Page 18 of 25
Samsung Electronics Co., Ltd. et al. v. One-E-Way, Inc.
IPR2025-01541

Continuation from U.S. Patent Application No.: 10/648,012

Attorney Docket No.: 1028.2

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

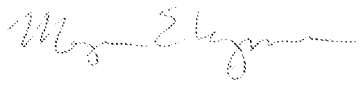
In re Application of:	:	Art Unit: 2615
C. Earl Woolfork	:	
	:	
	:	
For: WIRELESS DIGITAL AUDIO SYSTEM	:	Customer No.: 68533
	:	

COVER LETTER FOR PREVIOUSLY FILED DELCARATION

Dear Sir:

The Applicant respectfully submits this previously filed copy of a declaration in U.S. Patent Application No.: 10/648,012, filed August 26, 2003 which claimed benefit of U.S. Patent Application No. 10/027,391, filed December 21, 2001, now abandoned. This previously filed copy of a declaration satisfies the requirements of a declaration under 37 C.F.R. 1.63(d)(1)(iv) as part of the presently filed continuation application.

Best Regards,



Megan Lyman, Reg. No. 57,054

COMBINATION DECLARATION AND POWER OF ATTORNEY

As the below named inventor, I hereby declare that this declaration is an original.

INVENTORSHIP IDENTIFICATION

My residence, post office address and citizenship are as stated below next to my name, I believe I am the original, first and sole inventor of the subject matter which is claimed and for which a patent is sought on the invention entitled: **FUZZY AUDIO WIRELESS MUSIC SYSTEM**.

SPECIFICATION IDENTIFICATION

The specification is attached hereto.

ACKNOWLEDGEMENT OF REVIEW OF PAPERS AND DUTY OF CANDOR

I hereby state that I have reviewed and understand the contents of the above identified specification, including the claims, as amended by any amendment referred to above. I acknowledge the duty to disclose information which is material to the examination of this application in accordance with Title 37, Code of Federal Regulations, Section 1.56(a), including information that occurred between the filing date of the prior application and the national filing date of the continuation-in-part application.

PRIORITY CLAIM

I hereby claim foreign priority benefits under Title 35, United States Code, Section 119 of any foreign applications(s) for patent or inventor's certificate or of any PCT international application(s) designating at least one country other than the United States of America listed below and have also identified below any foreign application(s) for patent or inventor's certificate or any PCT international application(s) designating at least one country other than the United States of America filed by me on the same subject matter having a filing date before that of the application(s) of which priority is claimed.

No such applications have been filed.

Dated: 8/20/03

C. EARL WOOLFORK

Electronic Patent Application Fee Transmittal

Application Number:	
Filing Date:	
Title of Invention:	Wireless Digital Audio Music System
First Named Inventor/Applicant Name:	Cedric Earl Woolfork
Filer:	Megan Elizabeth Lyman
Attorney Docket Number:	1028.2
Filed as Small Entity	

Utility Filing Fees

Description	Fee Code	Quantity	Amount	Sub-Total in USD($)
Basic Filing:				
Utility filing Fee (Electronic filing)	4011	1	75	75
Utility Search Fee	2111	1	255	255
Utility Examination Fee	2311	1	105	105
Pages:				
Claims:				
Independent claims in excess of 3	2201	2	105	210
Miscellaneous-Filing:				
Petition:				

Description	Fee Code	Quantity	Amount	Sub-Total in USD($)
Patent-Appeals-and-Interference:				
Post-Allowance-and-Post-Issuance:				
Extension-of-Time:				
Miscellaneous:				
		Total in USD ($)		**645**

Electronic Acknowledgement Receipt	
EFS ID:	3506424
Application Number:	12144729
International Application Number:	
Confirmation Number:	2092
Title of Invention:	Wireless Digital Audio Music System
First Named Inventor/Applicant Name:	Cedric Earl Woolfork
Customer Number:	68533
Filer:	Megan Elizabeth Lyman
Filer Authorized By:	
Attorney Docket Number:	1028.2
Receipt Date:	24-JUN-2008
Filing Date:	
Time Stamp:	10:28:18
Application Type:	Utility under 35 USC 111(a)

Payment information:

Submitted with Payment	yes
Payment Type	Deposit Account
Payment was successfully received in RAM	$645
RAM confirmation Number	7470
Deposit Account	504576
Authorized User	
The Director of the USPTO is hereby authorized to charge indicated fees and credit any overpayment as follows: Charge any Additional Fees required under 37 C.F.R. Section 1.16 (National application filing, search, and examination fees) Charge any Additional Fees required under 37 C.F.R. Section 1.17 (Patent application and reexamination processing fees)	

Charge any Additional Fees required under 37 C.F.R. Section 1.19 (Document supply fees)

Charge any Additional Fees required under 37 C.F.R. Section 1.21 (Miscellaneous fees and charges)

File Listing:

Document Number	Document Description	File Name	File Size(Bytes) /Message Digest	Multi Part /.zip	Pages (if appl.)
1	Transmittal of New Application	TransmittalSheet.pdf	73278 2952dbc9a692fd79ff9ef63143b011e11fc4c7ac	no	1
Warnings:					
Information:					
2	Application Data Sheet	ContinuationADSJune08.pdf	1637825 993504214 2b36871702c45842935773 9d80fddfc	no	4
Warnings:					
Information:					
3		Specification.pdf	67282 69017c054413ac48f5775612c9fd430c07e0fc0d	yes	7

Multipart Description/PDF files in .zip description

Document Description	Start	End
Specification	1	6
Abstract	7	7

Warnings:					
Information:					
4	Claims	ContinuationClaims.pdf	68022 c52d8fbc96cc95524680ec8716dbae6e44671a1c	no	6
Warnings:					
Information:					
5	Oath or Declaration filed	ContinuationDeclaration.pdf	625959 19e0d60728f690beabf42d6e2dd4511f0359f700	no	2
Warnings:					
Information:					
6	Fee Worksheet (PTO-06)	fee-info.pdf	8478 53109e9c7520d500bd5286d778c3689dbaf119cd	no	2
Warnings:					
Information:					
		Total Files Size (in bytes):	2480844		

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

New Applications Under 35 U.S.C. 111
If a new application is being filed and the application includes the necessary components for a filing date (see 37 CFR 1.53(b)-(d) and MPEP 506), a Filing Receipt (37 CFR 1.54) will be issued in due course and the date shown on this Acknowledgement Receipt will establish the filing date of the application.

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

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