(12) **United States Patent** (10) **Patent No.:** **US 7,412,294 B1**
Woolfork (45) **Date of Patent:** **Aug. 12, 2008**

(54) **WIRELESS DIGITAL AUDIO SYSTEM**

(76) Inventor: **C. Earl Woolfork**, 500 Santa Paula Ave., Pasadena, CA (US) 91107

(*) Notice: Subject to any disclaimer, the term of this patent is extended or adjusted under 35 U.S.C. 154(b) by 199 days.

(21) Appl. No.: **10/648,012**

(22) Filed: **Aug. 26, 2003**

Related U.S. Application Data

(63) Continuation-in-part of application No. 10/027,391, filed on Dec. 21, 2001, now abandoned.

(51) **Int. Cl.**
 G06F 17/00 (2006.01)
 H04H 40/00 (2008.01)
(52) **U.S. Cl.** **700/94**; 455/3.06
(58) **Field of Classification Search** 700/94;
 714/709, 780, 795, 794, 75; 706/8, 9; 455/3.06,
 455/41, 66.1, 41.3, 564.1, 412, 413; 375/224,
 375/295–297, 346, 348, 219, 341, 140, 147,
 375/146, 130, 340, 316, 148, 262, 265, 413;
 381/79; 705/8, 9
 See application file for complete search history.

(56) **References Cited**

U.S. PATENT DOCUMENTS

5,491,839 A *	2/1996	Schotz	....	455/39
5,771,441 A *	6/1998	Altstatt	....	455/66.1
5,790,595 A *	8/1998	Benthin et al.	....	375/224
5,946,343 A *	8/1999	Schotz et al.	....	375/141
6,342,844 B1 *	1/2002	Rozin	....	340/933
6,418,558 B1 *	7/2002	Roberts et al.	....	725/129
6,678,892 B1 *	1/2004	Lavelle et al.	....	725/75
6,982,132 B1 *	1/2006	Goldner et al.	....	429/162

2003/0045235 A1 *	3/2003	Mooney et al.	....	455/41
2004/0223622 A1 *	11/2004	Lindemann et al.	....	381/79

OTHER PUBLICATIONS

Specification of the Bluetooth System, Version 1.0 B, pp. 17-27, 4144, 81-86, 143-147.*
Pohlman, K. C. Principles of Digital Audio. McGraw-Hill, Inc., 3rd ed. 1995. pp. 155-157.*
SAA7360 Bitstream conversion ADC for digital audio systems. Datasheet [online]. Philips Semiconductors, 1995 [retrieved on Dec. 15, 2005]. Retrieved from the Internet: <URL: http://www.ortodox-ism.ro/datasheets/philips/SAA7360GP.pdf>.*
wikipeda.com entry for Viterbi Decoder.*
wikipeda.com entry for Viterbi Algorithm.*
A Tutorial on Convolutional Coding with Viterbi Decoding; Chip Flemming.*
www.telecomspace.com overview for CDMA.*
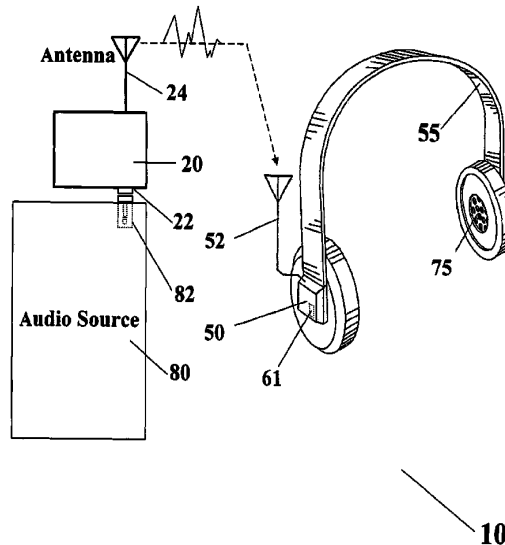"Digital Communication Techniques" by Simon, Hinedi and Lindsey.*

(Continued)

Primary Examiner—Suhan Ni
Assistant Examiner—Andrew C Flanders
(74) *Attorney, Agent, or Firm*—Megan E. Lyman

(57) **ABSTRACT**

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 head-phone set. The audio receiver is configured for digital wire-less 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) com-munication. The wireless digital audio system allows private audio enjoyment without interference from other users of independent wireless digital transmitters and receivers shar-ing the same space.

19 Claims, 3 Drawing Sheets

OTHER PUBLICATIONS

"Wireless Communications" by Rappaport.

"Communication Networks" by Walrand.

"Unified Analysis of Certain Coherent and Noncoherent Binary Communications Systems" by Stein in IEEE Transactions on Information Therory, Jan. 1964.
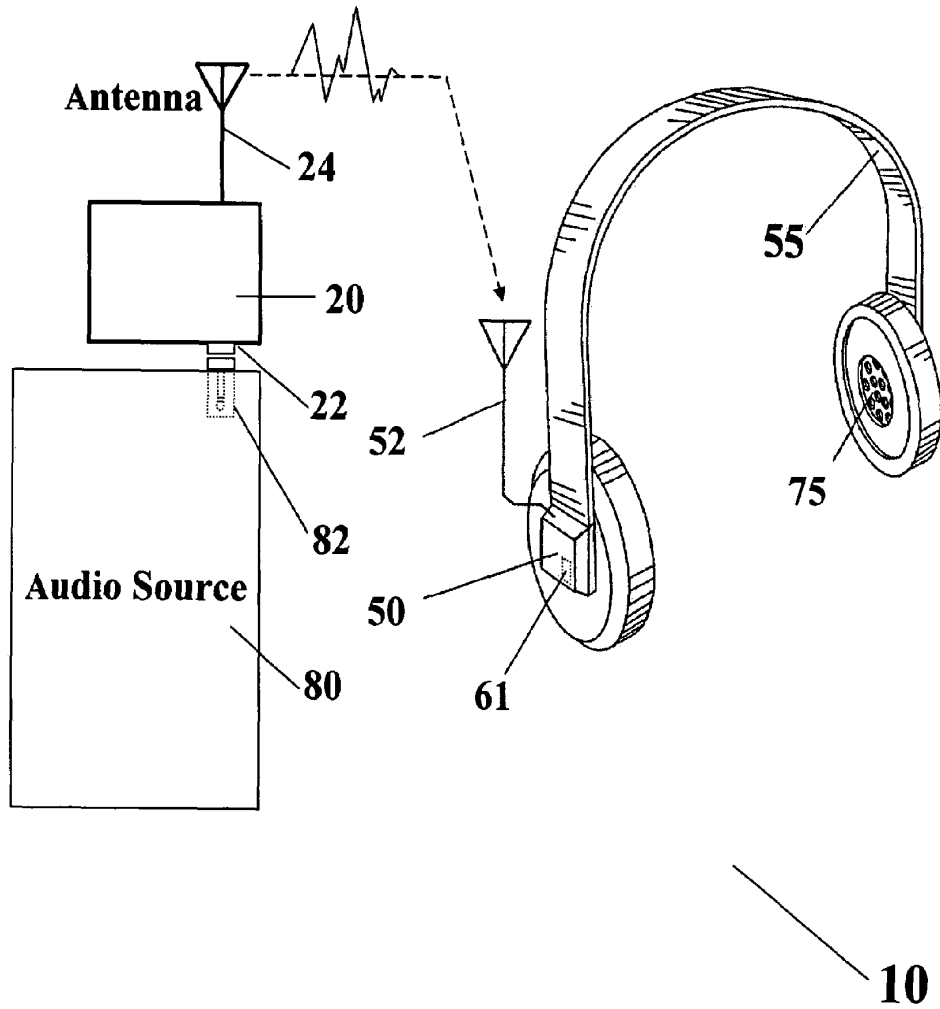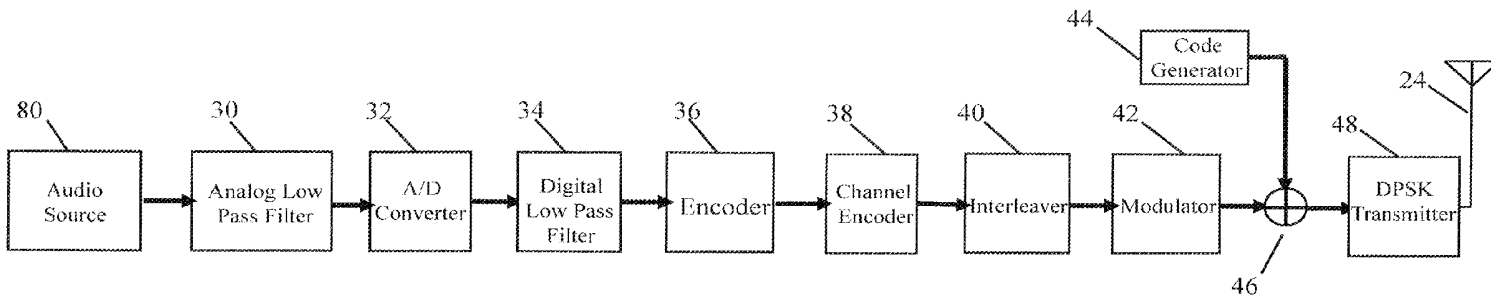
* cited by examiner

Antenna

24

20

22

82

Audio Source

80

52

50
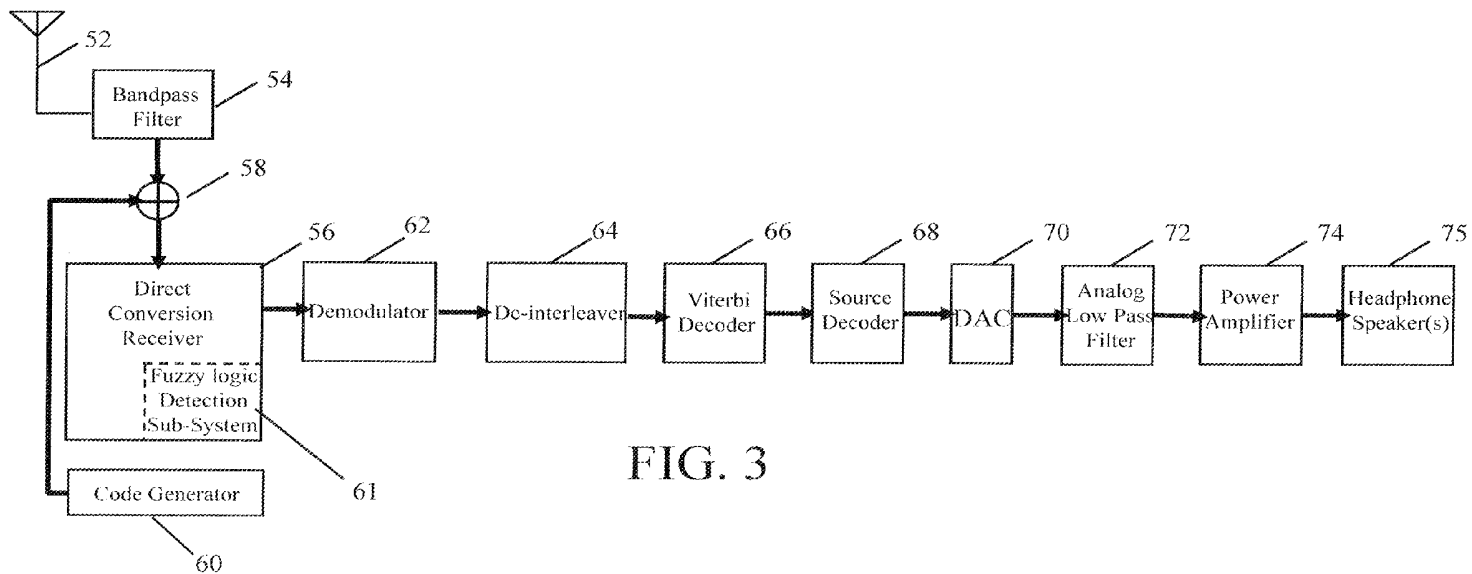
61

55
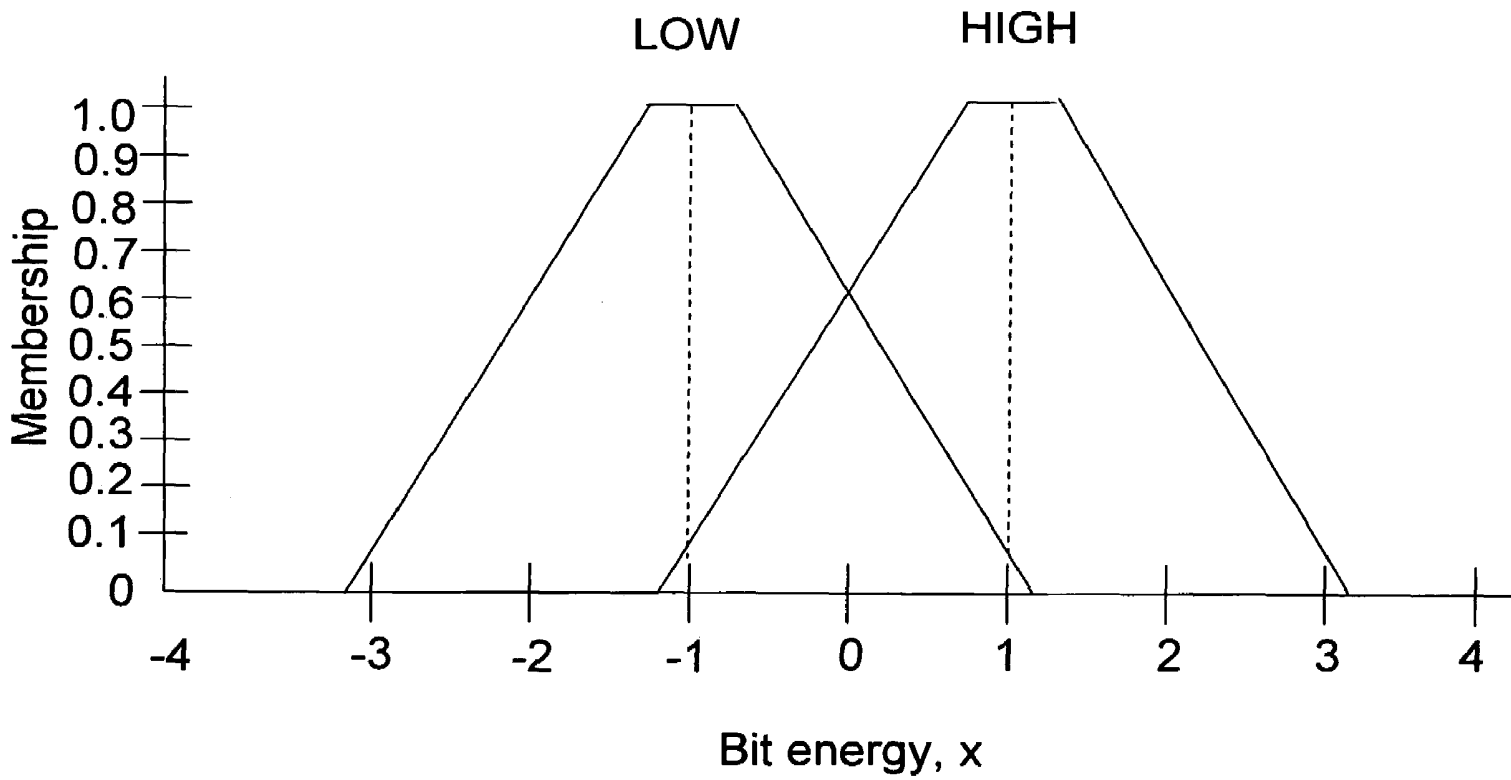
75

10

FIG.1

FIG. 2

FIG. 3

Fig. 4

DOCKET ALARM

Explore Litigation Insights

Docket Alarm provides insights to develop a more informed litigation strategy and the peace of mind of knowing you're on top of things.

Real-Time Litigation Alerts

Keep your litigation team up-to-date with **real-time alerts** and advanced team management tools built for the enterprise, all while greatly reducing PACER spend.

Our comprehensive service means we can handle Federal, State, and Administrative courts across the country.

Advanced Docket Research

With over 230 million records, Docket Alarm's cloud-native docket research platform finds what other services can't. Coverage includes Federal, State, plus PTAB, TTAB, ITC and NLRB decisions, all in one place.

Identify arguments that have been successful in the past with full text, pinpoint searching. Link to case law cited within any court document via Fastcase.

Analytics At Your Fingertips

Learn what happened the last time a particular judge, opposing counsel or company faced cases similar to yours.

Advanced out-of-the-box PTAB and TTAB analytics are always at your fingertips.

API

Docket Alarm offers a powerful API (application programming interface) to developers that want to integrate case filings into their apps.

LAW FIRMS
Build custom dashboards for your attorneys and clients with live data direct from the court.

Automate many repetitive legal tasks like conflict checks, document management, and marketing.

FINANCIAL INSTITUTIONS
Litigation and bankruptcy checks for companies and debtors.

E-DISCOVERY AND LEGAL VENDORS
Sync your system to PACER to automate legal marketing.