



US008837257B2

(12) **United States Patent**
Surprenant et al.

(10) **Patent No.:** **US 8,837,257 B2**
(45) **Date of Patent:** **Sep. 16, 2014**

(54) **ACOUSTIC MODULATION PROTOCOL**

(75) Inventors: **Richard S. Surprenant**, Santa Clara, CA (US); **Chad G. Seguin**, Morgan Hill, CA (US); **Brett L. Paulson**, Palo Alto, CA (US)

(73) Assignee: **Verifone Systems, Incorporated**, San Jose, CA (US)

(*) Notice: Subject to any disclaimer, the term of this patent is extended or adjusted under 35 U.S.C. 154(b) by 519 days.

(21) Appl. No.: **13/151,516**

(22) Filed: **Jun. 2, 2011**

(65) **Prior Publication Data**

US 2012/0134238 A1 May 31, 2012

Related U.S. Application Data

(60) Provisional application No. 61/417,705, filed on Nov. 29, 2010.

(51) **Int. Cl.**

H04B 1/00 (2006.01)
H04L 27/00 (2006.01)
H04L 25/38 (2006.01)
H04S 1/00 (2006.01)

(52) **U.S. Cl.**

CPC **H04S 1/007** (2013.01)
USPC **367/137; 375/141; 375/370; 375/326**

(58) **Field of Classification Search**

None
See application file for complete search history.

(56) **References Cited**

U.S. PATENT DOCUMENTS

5,359,367 A 10/1994 Stockill
5,604,771 A * 2/1997 Quiros 375/326
6,038,436 A 3/2000 Priest

7,796,978 B2 9/2010 Jones et al.
2002/0101917 A1 8/2002 Bibl
2002/0176584 A1 * 11/2002 Kates 381/60
2003/0031318 A1 2/2003 Troyansky
2003/0144035 A1 7/2003 Weinblatt
2003/0232593 A1 12/2003 Wahlroos et al.
2004/0031856 A1 2/2004 Atsmon
2005/0223030 A1 10/2005 Morris

(Continued)

FOREIGN PATENT DOCUMENTS

GB 2363275 A 12/2001
GB 2363275 B 7/2002

OTHER PUBLICATIONS

Nielsen Media-Sync Platform Backs ABC's My Generation Sync iPad App—WebNewser, David Cohen, Sep. 16, 2010.

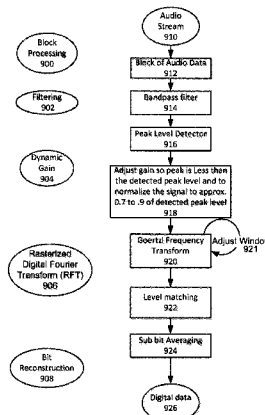
(Continued)

Primary Examiner — Isam Alsomiri
Assistant Examiner — Hovhannes Baghdasaryan
(74) *Attorney, Agent, or Firm* — Convergent Law Group LLP

(57) **ABSTRACT**

Exemplary embodiments provide a computer-implemented method for generating a modulated acoustic carrier signal for wireless transmission from a speaker of a transmit device to a microphone of a receive device. Aspects of the exemplary embodiments include converting a message to binary data; modulating one or more selected frequencies for one or more acoustic carrier signals based on the binary data to generate one or more modulated acoustic carrier signals; filtering the one or more modulated acoustic carrier signals to remove any unintended audible harmonics created during modulation, including; equalizing the modulated acoustic carrier signal to pre-compensate for known degradations that will occur further along a signal path; setting a level of the modulated acoustic carrier signal for the intended application; and storing the modulated acoustic carrier signal in a buffer for subsequent output and transmission by the speaker.

25 Claims, 16 Drawing Sheets



(56)

References Cited

U.S. PATENT DOCUMENTS

2005/0246747 A1 11/2005 Braun et al.
2007/0211786 A1* 9/2007 Shattil 375/141
2008/0039135 A1 2/2008 Nakamura et al.
2008/0273644 A1* 11/2008 Chesnutt et al. 375/370
2008/0306736 A1 12/2008 Sanyal
2009/0041260 A1 2/2009 Jorgensen
2009/0059903 A1 3/2009 Kubler
2009/0076825 A1 3/2009 Bradford
2009/0154603 A1 6/2009 Li
2009/0156193 A1 6/2009 Urbanija

2009/0169038 A1 7/2009 Knudsen
2009/0305677 A1 12/2009 Ellison et al.
2010/0119208 A1 5/2010 Davis et al.
2012/0078702 A1 3/2012 Rissanen
2013/0010979 A1 1/2013 Takara

OTHER PUBLICATIONS

MetaMirror & The Future of TV, <http://www.designbynotion.com/metamirror-next-generation-tv/>, Aug. 5th, 2010.
Mozaik, <http://mymosaic.net/www/icontent.php>.

* cited by examiner

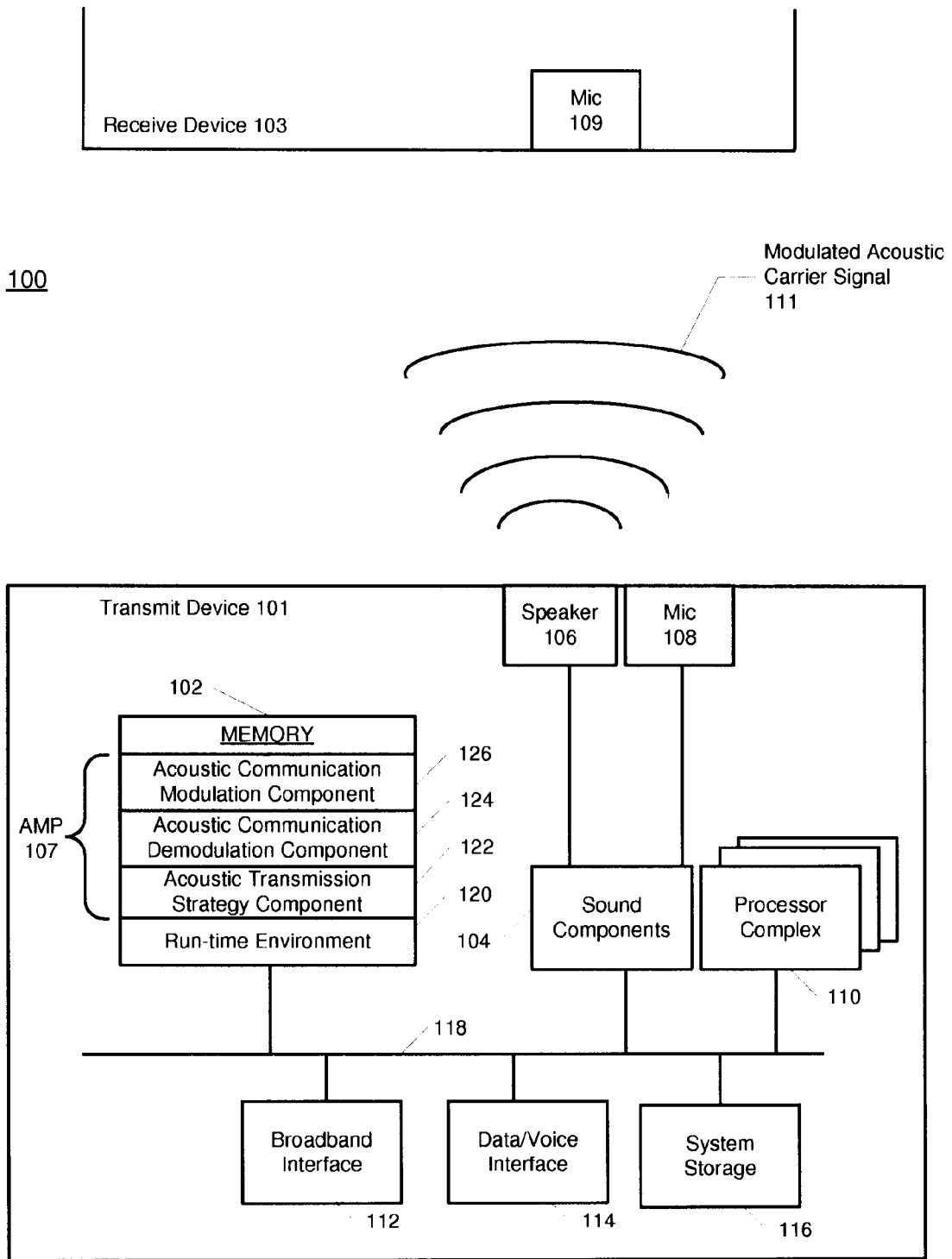


FIG. 1

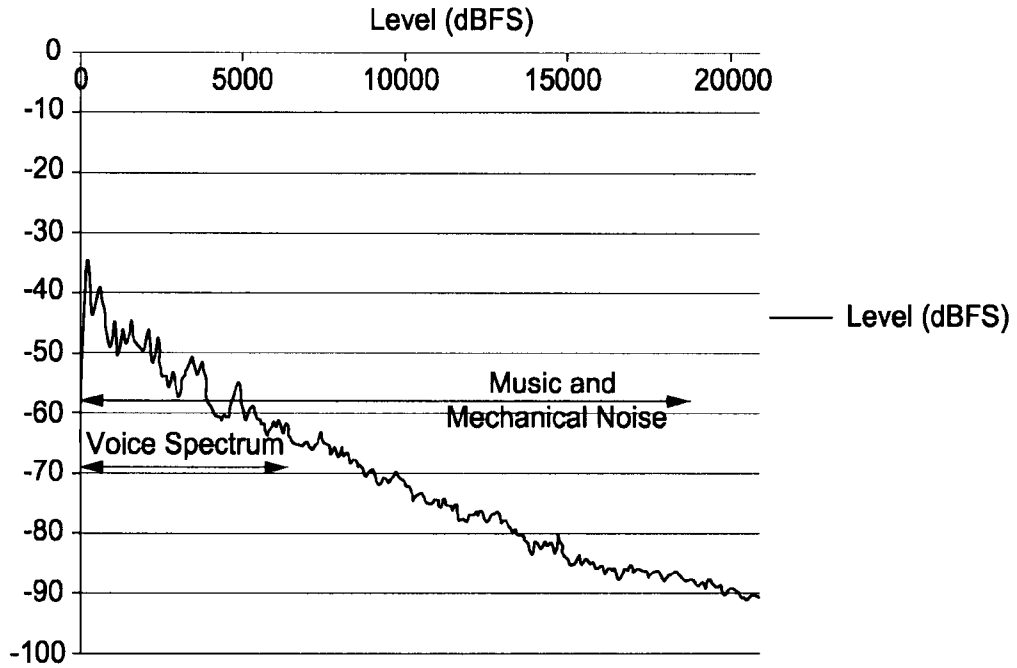


FIG. 2A

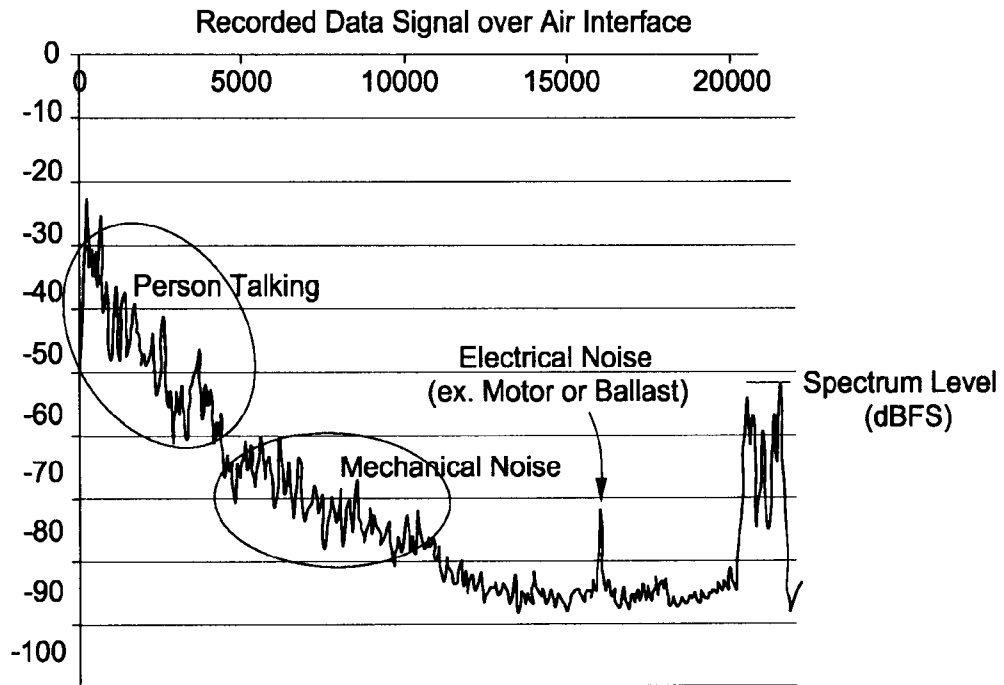


FIG. 2B

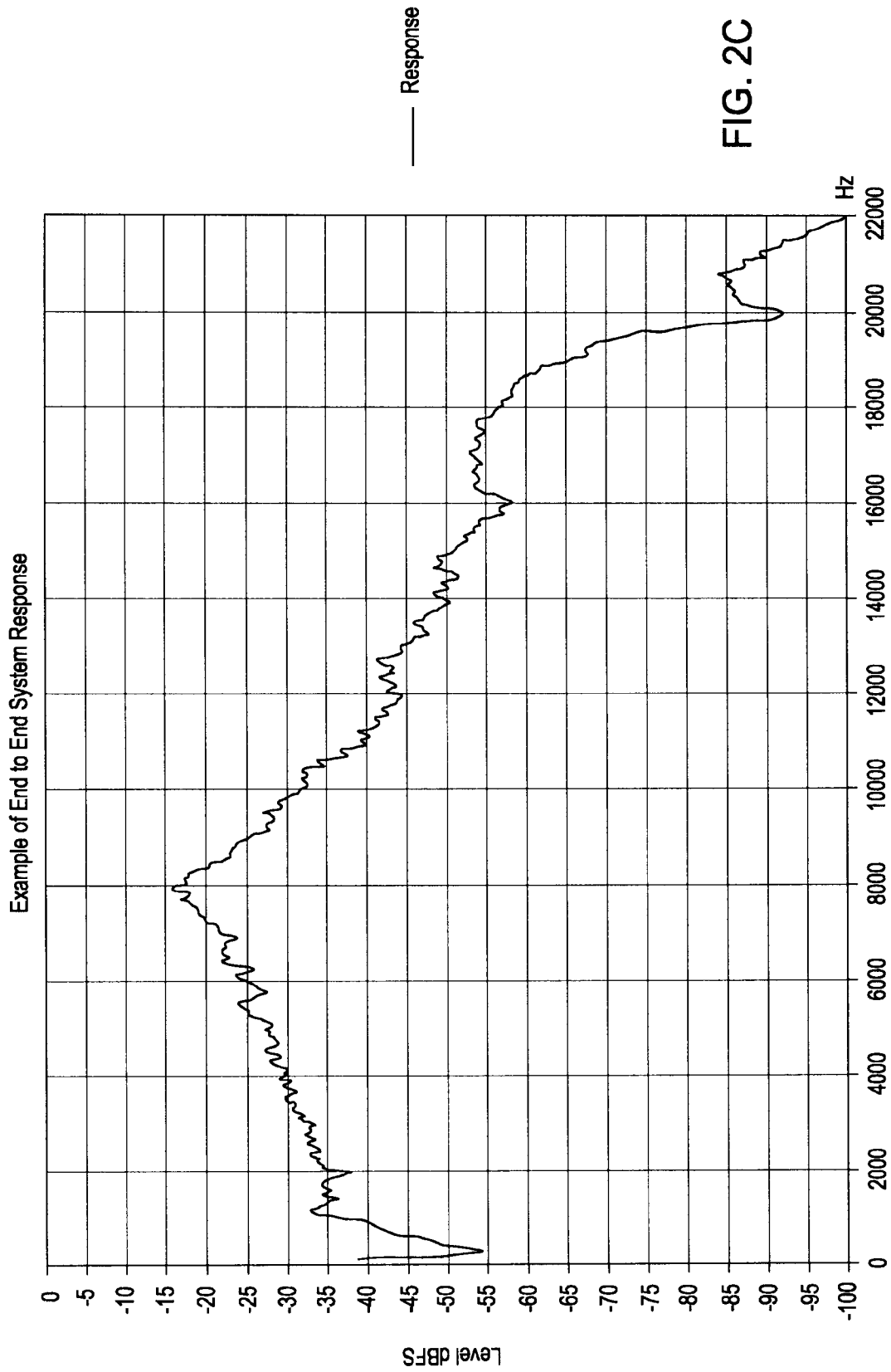


FIG. 2C

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.