



US008190203B2

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

(10) **Patent No.:** **US 8,190,203 B2**
(45) **Date of Patent:** **May 29, 2012**

(54) **WIRELESS EARPHONE THAT TRANSITIONS BETWEEN WIRELESS NETWORKS**

(75) Inventors: **Michael J. Pelland**, Princeton, WI (US); **Michael J. Koss**, River Hills, WI (US); **Michael Sagan**, Marshall, WI (US); **Steven R. Reckamp**, Crystal Lake, IL (US); **Gregory J. Hallingstad**, Madison, WI (US); **Jeffrey K. Bovee**, Lake Geneva, WI (US); **Morgan J. Lowery**, DeForest, WI (US)

(73) Assignee: **Koss Corporation**, Milwaukee, WI (US)

(*) Notice: Subject to any disclaimer, the term of this patent is extended or adjusted under 35 U.S.C. 154(b) by 0 days.

(21) Appl. No.: **12/936,488**

(22) PCT Filed: **Apr. 7, 2009**

(86) PCT No.: **PCT/US2009/039754**

§ 371 (c)(1),
(2), (4) Date: **Dec. 20, 2010**

(87) PCT Pub. No.: **WO2009/126614**

PCT Pub. Date: **Oct. 15, 2009**

(65) **Prior Publication Data**

US 2011/0103609 A1 May 5, 2011

Related U.S. Application Data

(60) Provisional application No. 61/123,265, filed on Apr. 7, 2008.

(51) **Int. Cl.**
H04M 1/00 (2006.01)
H04R 1/10 (2006.01)

(52) **U.S. Cl.** **455/556.1; 381/74**

(58) **Field of Classification Search** 455/445, 455/414.4, 73, 456.1, 420, 20, 11.1, 421; 370/401, 352, 335; 381/74
See application file for complete search history.

(56) **References Cited**

U.S. PATENT DOCUMENTS

5,784,685 A 7/1998 Stanford et al.
6,792,091 B2 9/2004 Lemchen et al.
6,937,712 B2 8/2005 Lemchen et al.
7,003,515 B1 2/2006 Glaser
7,027,311 B2 4/2006 Vanderelli
7,099,370 B2 8/2006 Takahashi
7,120,388 B2 10/2006 Hall
7,139,585 B2 11/2006 Hachimura et al.
7,599,679 B2 10/2009 Awiszus

(Continued)

FOREIGN PATENT DOCUMENTS

WO WO 2007/136620 A2 11/2007

(Continued)

OTHER PUBLICATIONS

Supplementary European Search Report for European Application No. 09731146.8 mailed Jun. 10, 2011, 7 pages.

(Continued)

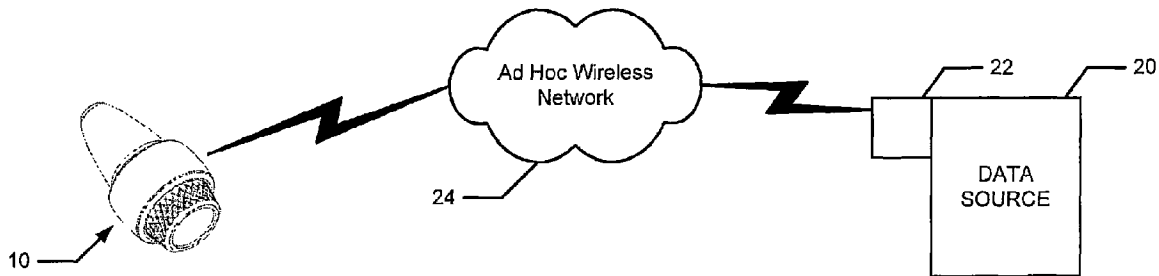
Primary Examiner — Kiet Doan

(74) *Attorney, Agent, or Firm* — K&L Gates LLP

(57) **ABSTRACT**

A wireless earphone that comprises a transceiver circuit for receiving streaming audio from a data source over a local ad hoc wireless network. When the data source and the earphone are out of range, they transition automatically to an infrastructure wireless network. If there is no common infrastructure wireless network for both the data source and the speakerphone set, the earphone connects to a host server via an available wireless network.

33 Claims, 16 Drawing Sheets



U.S. PATENT DOCUMENTS

7,697,899 B2* 4/2010 Rofougaran 455/73
7,764,775 B2 7/2010 Tarkoff et al.
7,805,210 B2 9/2010 Cucos
2005/0064853 A1* 3/2005 Radpour 455/414.4
2005/0198233 A1 9/2005 Manchester
2006/0206487 A1 9/2006 Harada
2006/0212442 A1 9/2006 Conrad
2006/0212444 A1 9/2006 Handman
2007/0008984 A1 1/2007 Philips
2007/0037615 A1 2/2007 Glezerman
2007/0049198 A1 3/2007 Walsh et al.
2007/0116316 A1 5/2007 Goldberg
2007/0165875 A1 7/2007 Rezvani
2007/0230727 A1 10/2007 Sanguino
2008/0062939 A1 3/2008 Van Horn
2008/0101279 A1 5/2008 Russell
2008/0291891 A1 11/2008 Jerlhagen
2010/0246788 A1 9/2010 Menard et al.

FOREIGN PATENT DOCUMENTS

WO WO 2007/139578 A1 12/2007
WO WO 2008/054985 A2 5/2008
WO WO 2009/086555 A1 7/2009

OTHER PUBLICATIONS

International Search Report for International Application No. PCT/US09/39754 mailed Jun. 11, 2009, 2 pages.
International Preliminary Examination Report for International Application No. PCT/US09/39754 mailed Oct. 28, 2010, 8 pages.
Written Opinion of the International Searching Authority for International Application No. PCT/US09/39754 mailed Jun. 11, 2009, 5 pages.
IT Review, "LTB 802.11 WiFi Headphones", <http://itreview.belproject.com/item/1536> accessed on Mar. 13, 2008 (4 pages).

* cited by examiner

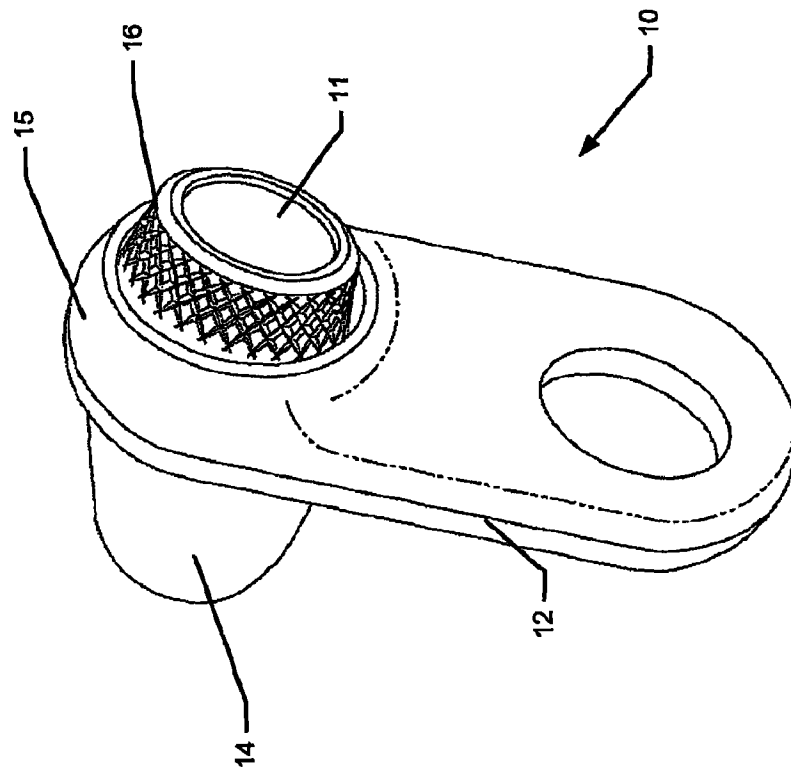


Fig. 1B

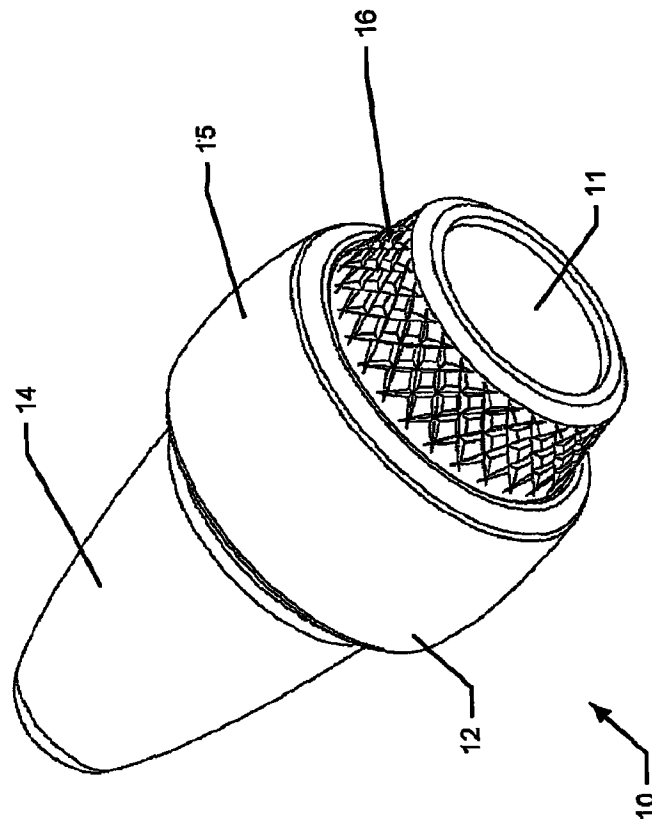


Fig. 1A

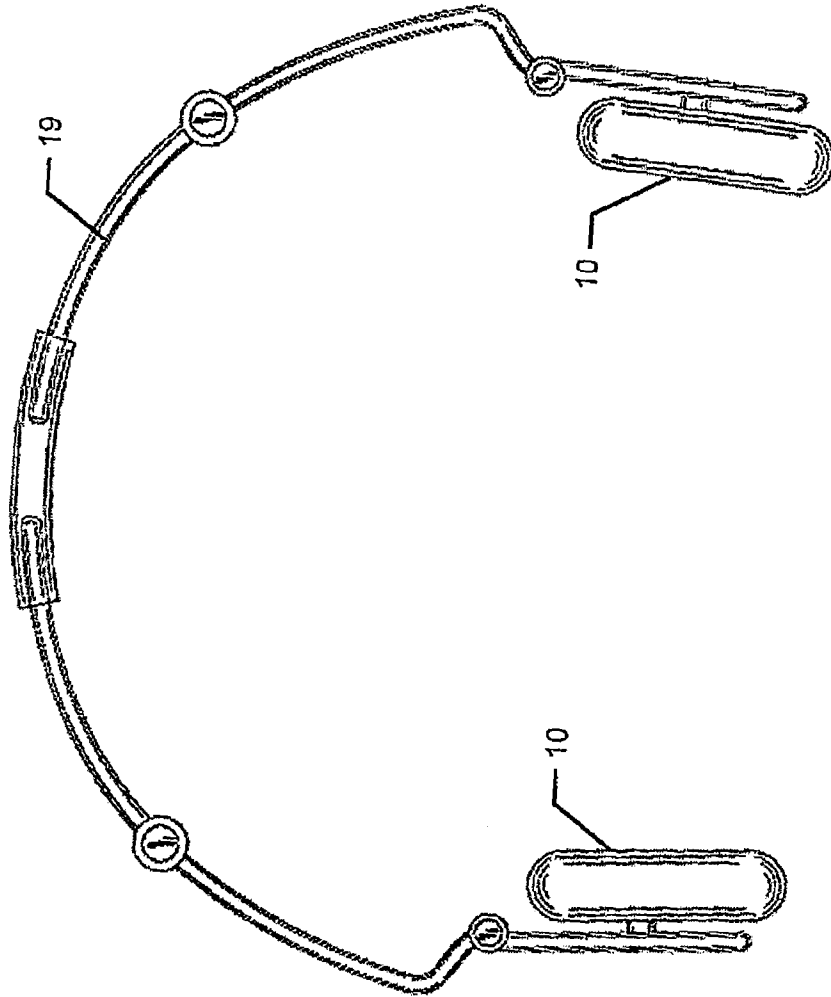


Fig. 1C

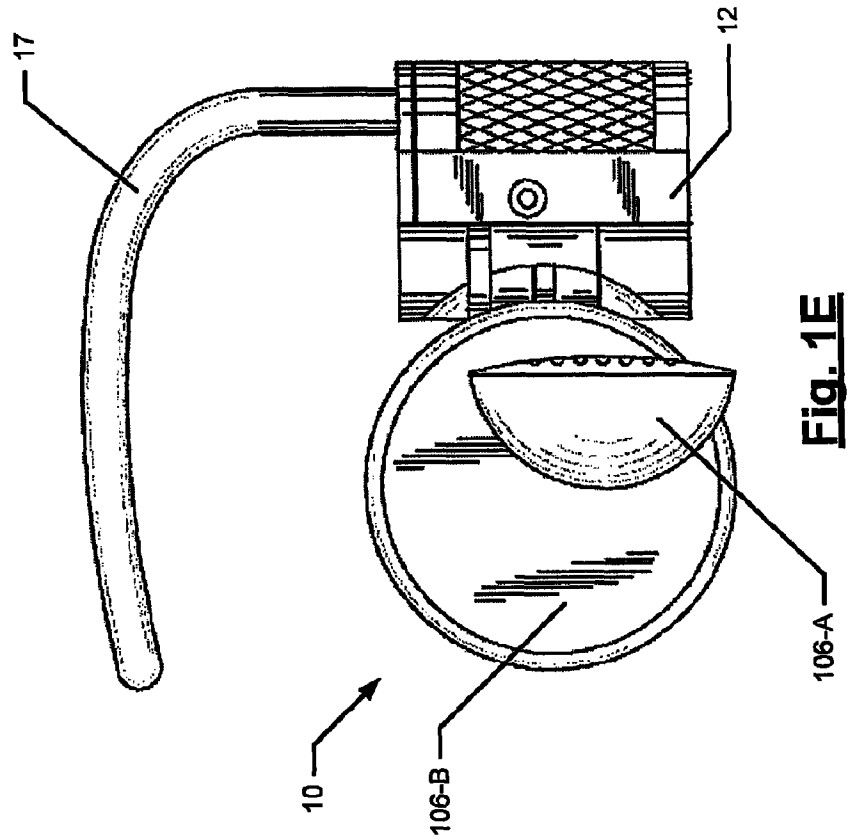


Fig. 1E

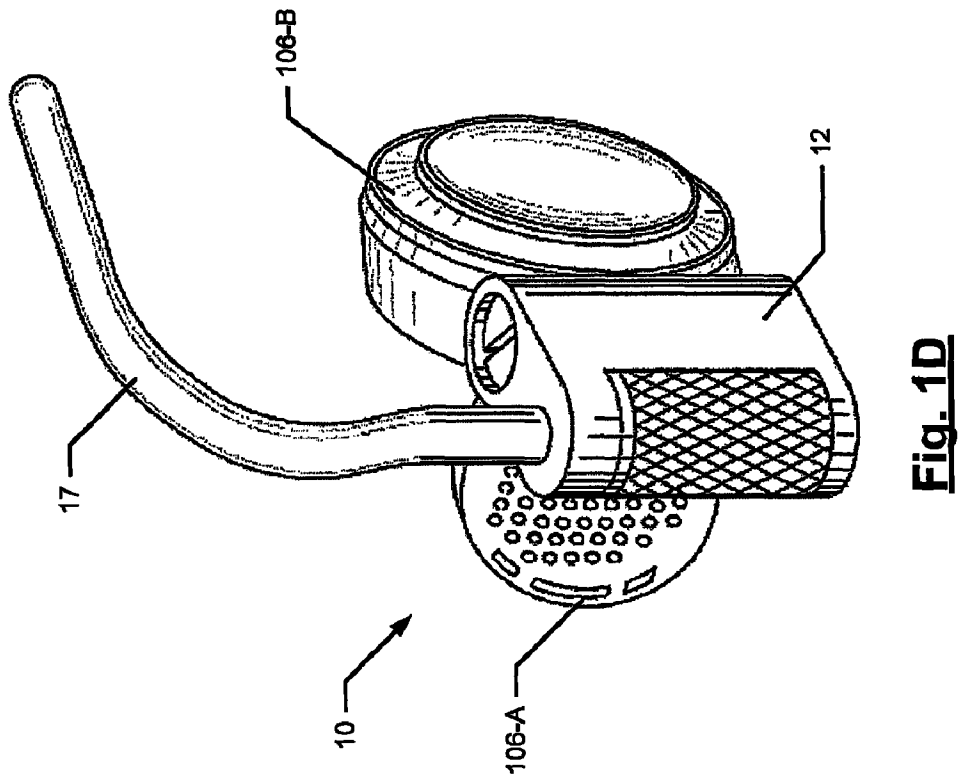


Fig. 1D

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.