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Koss et al.

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- (54) **SYSTEM WITH WIRELESS ACOUSTIC SPEAKERS**
- (71) Applicant: **Koss Corporation**, Milwaukee, WI (US)
- (72) Inventors: **Michael J. Koss**, Milwaukee, WI (US); **Michael J. Pelland**, Princeton, 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.

This patent is subject to a terminal disclaimer.

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Related U.S. Application Data

- (63) Continuation of application No. 14/695,696, filed on Apr. 24, 2015, which is a continuation of application No. 13/609,409, filed on Sep. 11, 2012, now Pat. No. 9,049,502, which is a continuation of application No. 13/459,291, filed on Apr. 30, 2012, now Pat. No. (Continued)

- (51) **Int. Cl.**
H04R 1/10 (2006.01)
H04R 25/00 (2006.01)
- (52) **U.S. Cl.**
CPC **H04R 1/1091** (2013.01); **H04R 2420/07** (2013.01)

- (58) **Field of Classification Search**
CPC H04R 2201/103; H04R 5/033
USPC 381/398, 77, 74, 379, 381, 309, 17, 381/111; 345/8; 455/3.06, 436, 570, 412.2, 455/553.1, 569.1, 575.2
See application file for complete search history.

(56) **References Cited**

U.S. PATENT DOCUMENTS

- 5,784,685 A 7/1998 Stanford et al.
- 6,389,463 B2 5/2002 Bolas
(Continued)

FOREIGN PATENT DOCUMENTS

- JP 2004-320597 11/2004
- WO WO 2006/047724 A2 5/2006
(Continued)

OTHER PUBLICATIONS

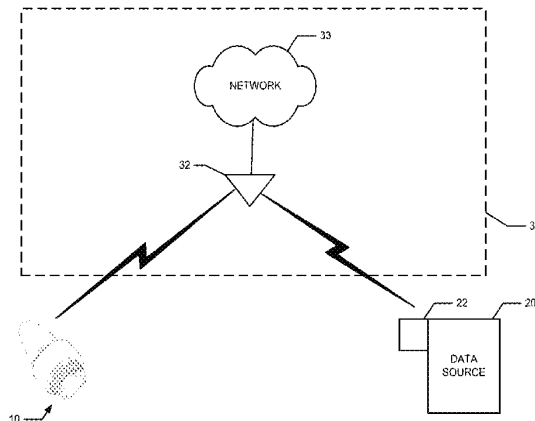
- Supplementary European Search Report for European Application No. 09731146.8 mailed Jun. 10, 2011, 7 pages.
(Continued)

Primary Examiner — Kiet Doan
(74) *Attorney, Agent, or Firm* — K&L Gates LLP

(57) **ABSTRACT**

Apparatus comprises adapter and speaker system. Adapter is configured to plug into port of personal digital audio player. Speaker system is in communication with adapter, and comprises multiple acoustic transducers, programmable processor circuit, and wireless communication circuit. In first operational mode, processor circuit receives, via adapter, and processes digital audio content from personal digital audio player into which adapter is plugged, and the multiple acoustic transducers output the received audio content from the personal digital audio player. In second operational mode, wireless communication circuit receives digital audio content from a remote digital audio source over a wireless network, processor circuit processes the digital audio content received from remote digital audio source, and the multiple acoustic transducers output the audio content received from the remote digital audio source.

12 Claims, 16 Drawing Sheets



Related U.S. Application Data

8,571,544, which is a continuation of application No. 12/936,488, filed as application No. PCT/US2009/039754 on Apr. 7, 2009, now Pat. No. 8,190,203.

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

(56) **References Cited**

U.S. PATENT DOCUMENTS

6,671,494	B1	12/2003	James	
6,674,864	B1	1/2004	Kitamura	
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	
7,095,455	B2	8/2006	Jordan	
7,099,370	B2	8/2006	Takahashi	
7,120,388	B2	10/2006	Hall	
7,139,585	B2	11/2006	Hachimura et al.	
7,266,390	B2	9/2007	Mathews	
7,337,027	B2	2/2008	Nishiguchi et al.	
7,467,021	B2	12/2008	Yuen	
7,512,414	B2	3/2009	Jannard et al.	
7,599,679	B2	10/2009	Awiszus	
7,650,168	B2	1/2010	Bailey	
7,680,490	B2	3/2010	Bloebaum et al.	
7,697,899	B2*	4/2010	Rofougaran	H04B 1/30 455/207
7,734,055	B2	6/2010	Chiloyan	
7,764,775	B2	7/2010	Tarkoff et al.	
7,805,210	B2	9/2010	Cucos	
7,861,312	B2	12/2010	Lee et al.	
7,962,482	B2	6/2011	Handman	
8,023,663	B2	9/2011	Goldberg	
8,027,638	B2	9/2011	Sanguino	
8,102,836	B2	1/2012	Jerlhagen	
8,190,203	B2	5/2012	Pelland et al.	
8,295,516	B2	10/2012	Kondo et al.	
8,335,312	B2	12/2012	Gerhardt et al.	
8,401,202	B2	3/2013	Brooking	
8,478,880	B2	7/2013	Finkelstein et al.	
8,553,865	B2	10/2013	Menard et al.	
8,571,544	B2	10/2013	Pelland et al.	
8,655,420	B1	2/2014	Pelland et al.	
8,792,945	B2	7/2014	Russell et al.	

9,049,502	B2	6/2015	Pelland et al.	
2004/0107271	A1	6/2004	Ahn et al.	
2005/0064853	A1*	3/2005	Radpour	H04W 88/02 455/414.4
2005/0198233	A1	9/2005	Manchester	
2005/0240296	A1*	10/2005	Nishiguchi	G11C 7/16 700/94
2006/0206487	A1	9/2006	Harada	
2006/0212442	A1	9/2006	Conrad	
2006/0268830	A1	11/2006	Evans	
2007/0008984	A1	1/2007	Philips	
2007/0037615	A1	2/2007	Glezerman	
2007/0049198	A1	3/2007	Walsh et al.	
2007/0165875	A1	7/2007	Rezvani	
2007/0253603	A1	11/2007	Kimura et al.	
2007/0297618	A1	12/2007	Nurmi et al.	
2008/0031470	A1	2/2008	Angelhag	
2008/0062939	A1	3/2008	Van Horn	
2008/0076489	A1	3/2008	Rosener et al.	
2008/0298606	A1	12/2008	Johnson et al.	
2009/0063703	A1*	3/2009	Finkelstein	G06F 17/30056 709/240
2010/0290642	A1	11/2010	Hasegawa	
2013/0039510	A1	2/2013	Pelland et al.	
2015/0237439	A1	8/2015	Koss et al.	

FOREIGN PATENT DOCUMENTS

WO	WO 2007/136620	A2	11/2007
WO	WO 2007/139578	A1	12/2007
WO	WO 2008/033478	A1	3/2008
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

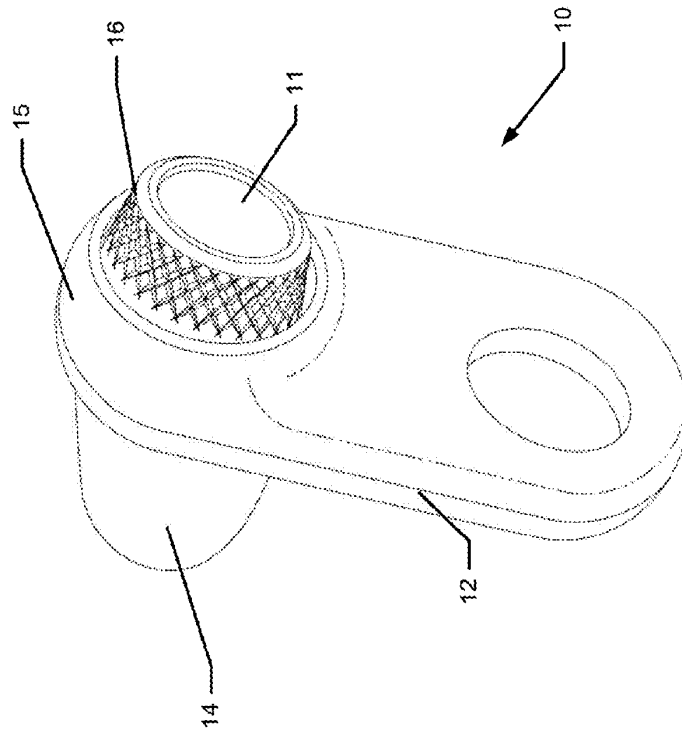


Fig. 1B

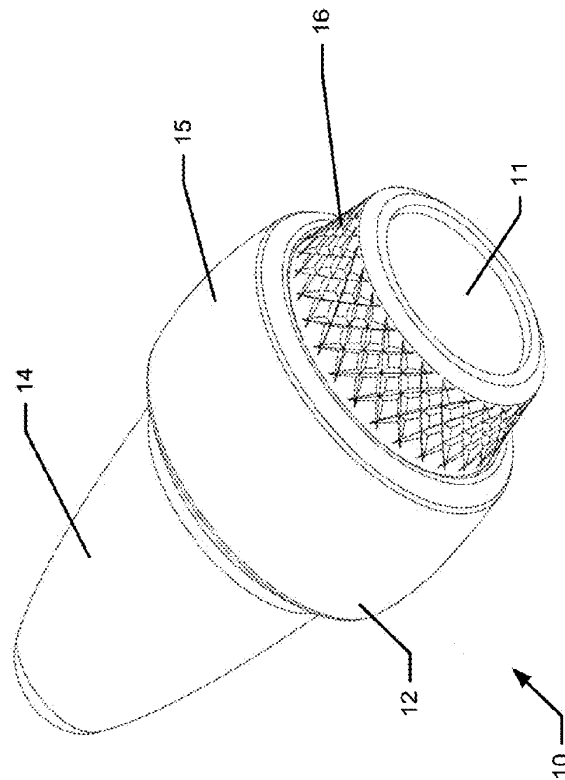


Fig. 1A

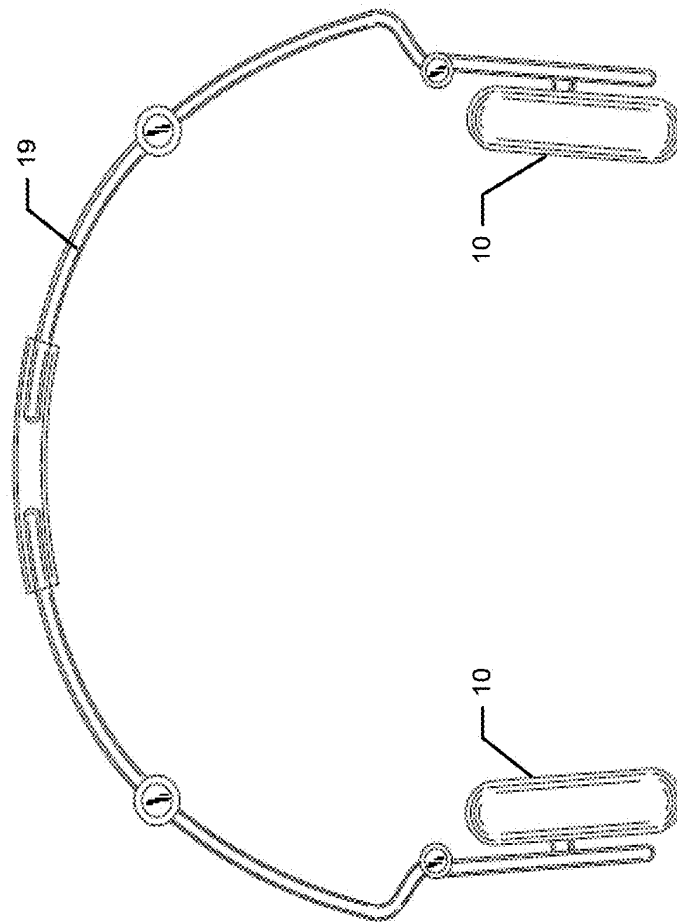


Fig. 1C

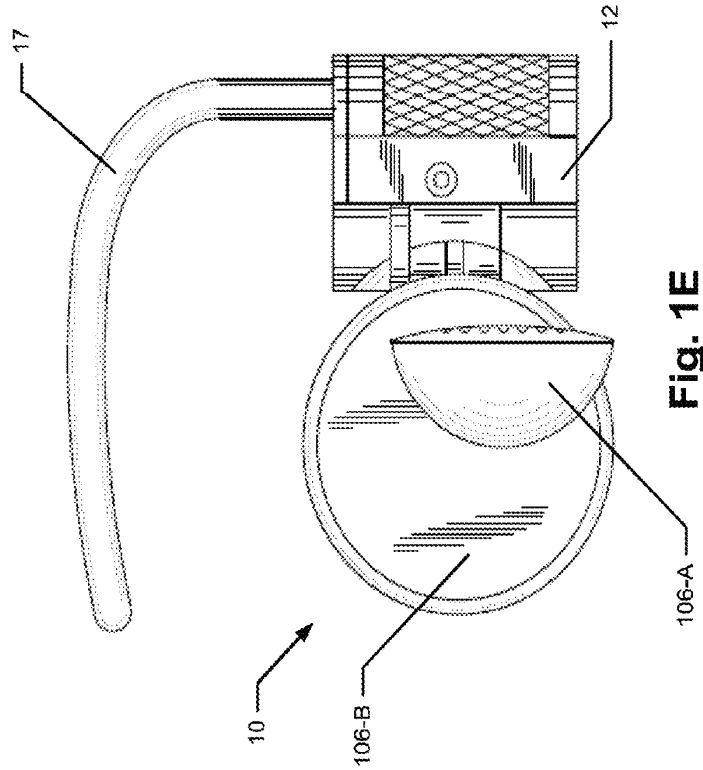


Fig. 1E

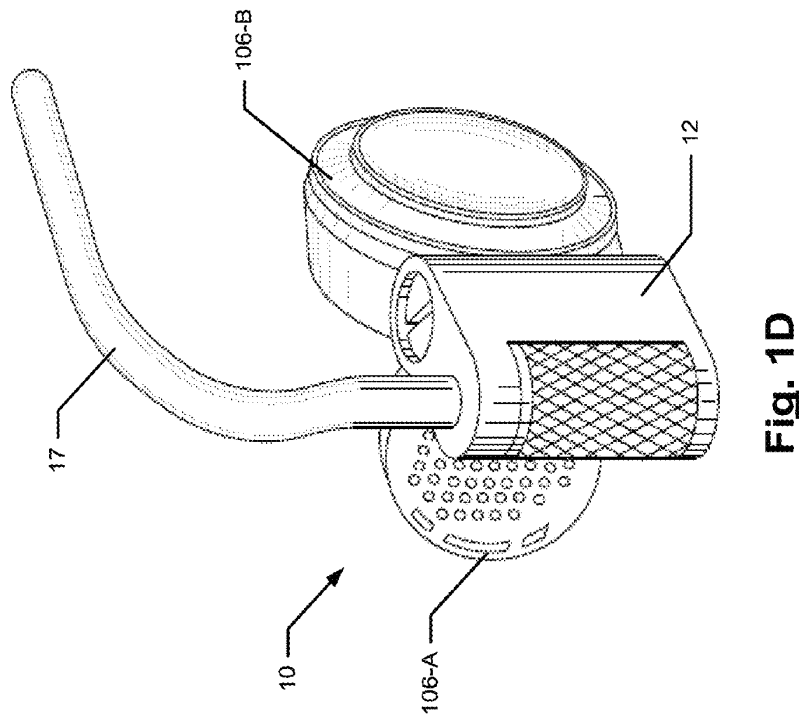


Fig. 1D

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