

UNITED STATES PATENT AND TRADEMARK OFFICE

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BEFORE THE PATENT TRIAL AND APPEAL BOARD

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HEADBOX, LLC  
Petitioner,

v.

INFINITE IMAGINEERING, INC.  
Patent Owner.

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Case IPR2014-00365  
Patent 8,085,966 B2

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Before GLENN J. PERRY, BENJAMIN D. M. WOOD, and  
PATRICK R. SCANLON, *Administrative Patent Judges*.

WOOD, *Administrative Patent Judge*.

FINAL WRITTEN DECISION  
*35 U.S.C. § 318(a) and 37 C.F.R. § 42.73*

## I. INTRODUCTION

### A. Background

Headbox, LLC d/b/a BoomPhones (“Petitioner”) filed a Petition (Paper 3, “Pet.”) to institute an *inter partes* review of claims 1–29 of U.S. Patent No. 8,085,966 B2 (Ex. 1001, “the ’966 patent”). Infinite Imagineering, Inc. (“Patent Owner”) did not file a Preliminary Response. We instituted an *inter partes* review of claims 1–3, 5, 8–14, 16–19, and 22–26 on the following asserted grounds of unpatentability:

Reference[s]	Basis	Claims Challenged
Kuo <sup>1</sup> and Awaba <sup>2</sup>	§ 103(a)	1, 2, 5, 8–12, 16, 24, and 26
Kuo, Awaba, and Liow <sup>3</sup>	§ 103(a)	3, 18, 19, 22, and 23
Kuo, Awaba, and Amid-Hozour <sup>4</sup>	§ 103(a)	17
Kuo, Awaba, and Ambourn <sup>5</sup>	§ 103(a)	25
Kuo, Awaba, and Acker <sup>6</sup>	§ 103(a)	13 and 14

Patent Owner did not file a Response to the Petition; consequently, Petitioner did not file a Reply in support of the Petition. *See* 37 C.F.R.

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<sup>1</sup> US 7,388,960 B2 (issued June 17, 2008 from an application filed Jan. 19, 2005) (Ex. 1003).

<sup>2</sup> WO 2005/096666 A1 (Oct. 13, 2005) (Ex. 1004).

<sup>3</sup> US 8,472,659 B2 (issued June 25, 2013 from an application filed Apr. 15, 2005) (Ex. 1005).

<sup>4</sup> US 7,043,044 B2 (issued May 9, 2006) (Ex. 1006).

<sup>5</sup> US 7,623,669 B2 (issued Nov. 24, 2009 from an application filed Mar. 25, 2005) (Ex. 1008).

<sup>6</sup> *Smart Audio Output with Presence Sensors: Enabling Mode Switching Using Head Sets or Ear Buds*, IP.com Disclosure No. IPCOM000130715D (Nov. 2, 2005) (Ex. 1009).

§ 42.23(b) (“A reply may only respond to arguments raised in the corresponding opposition or patent owner response.”). Patent Owner did not move to amend any of the challenged claims. Neither Party requested an oral hearing.

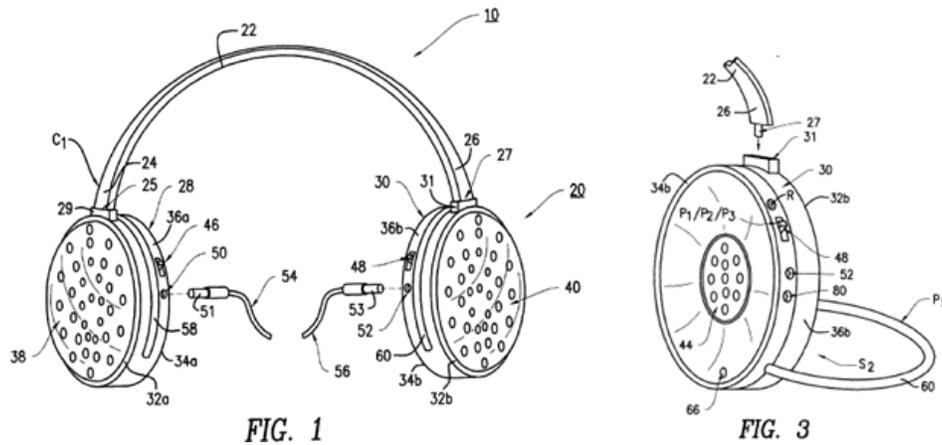
We have jurisdiction under 35 U.S.C. § 6(c). This Final Written Decision is entered pursuant to 35 U.S.C. § 318(a). We determine that Petitioner has shown by a preponderance of the evidence that claims 1–3, 5, 8–14, 16–19, 22, and 24–26 are unpatentable under 35 U.S.C. § 103. Because, as discussed below, we find claim 23 to be indefinite under 35 U.S.C. § 112, paragraph 2, we are unable to determine the patentability of this claim under 35 U.S.C. § 103.

*B. Related Proceedings*

Petitioner represents that there are no related proceedings. Pet. 1.

*C. The '966 Patent*

The '966 patent, titled “Combined Headphone Set and Portable Speaker Assembly,” issued on December 27, 2011 from an application filed January 10, 2007. Ex. 1001, cover page. The '966 patent describes a headphone set with “speaker headphone assemblies” on opposite ends of a headband. *Id.* at 3:21–24. Each of the speaker headphone assemblies includes two speakers: an exterior, outward-facing speaker for public listening and an interior, inward-facing speaker for personal listening. *Id.* at 3:24–27. Figures 1 and 3, reproduced below, illustrate one embodiment of the claimed invention:



As depicted in Figures 1 and 3, headphone set 10 comprises speaker headphone assemblies 28 and 30 attached to opposite ends of headband 22. *Id.* at 5:19–22. Each speaker headphone assembly 28, 30 comprises interior speaker 42, 44, respectively (the latter shown in figure 3), and exterior speaker 38, 40, respectively (shown in figure 1), in a back-to-back arrangement. Three-way switches 46 and 48 on speaker headphone assemblies 28, 30, respectively, allow the user to select the interior speakers, the exterior speakers, or both the interior and exterior speakers for listening. *Id.* at 5:48–54.

The speaker headphones 28 and 30 may also be equipped with sensor 66, such as an infrared beam or pressure switch, to detect if the speaker headphones are on a user's head. *Id.* at 6:28–32, Fig. 3. When the user removes the headphones they automatically switch from personal listening through the interior speakers to public listening through the exterior speakers. *Id.* at 6:32–35.

#### D. Exemplary Claims

Independent claim 1, reproduced below, is illustrative of the claimed subject matter at issue in this proceeding:

1. A combined headphone set including a speaker assembly, comprising:
  - a) a headphone set including a headband having a speaker headphone on opposing ends of said headband;
  - b) each of said speaker headphones including an exterior speaker for public listening and an interior speaker for personal listening by the user;
  - c) one of said speaker headphones including switching means for listening to said interior speaker or to said exterior speaker or to said interior and exterior speakers simultaneously from each of said speaker headphones; and
  - d) said speaker headphones including an audio signal wire being connected from an output jack of an audio device to said speaker headphones.

## II. ANALYSIS

### A. *Claim Construction*

“A claim in an unexpired patent shall be given its broadest reasonable construction in light of the specification of the patent in which it appears.” 37 C.F.R. § 42.100(b); *see In re Cuozzo Speed Tech., LLC*, 778 F.3d 1271, 1281 (Fed. Cir. 2015) (“We conclude that Congress implicitly adopted the broadest reasonable interpretation standard in enacting the AIA.”). Under that standard, the claim language should be read in light of the specification as it would be interpreted by one of ordinary skill in the art. *In re Suitco Surface, Inc.*, 603 F.3d 1255, 1260 (Fed. Cir. 2010). Thus, we generally give claim terms their ordinary and customary meaning. *See In re Translogic Tech., Inc.*, 504 F.3d 1249, 1257 (Fed. Cir. 2007) (“The ordinary and customary meaning is the meaning that the term would have to a person of ordinary skill in the art in question.”) (internal quotation marks omitted).

We address the construction of “volume controlling means,” used in claim 23, below. Petitioner also proposes constructions for the terms “switching means,” “wireless technology means,” and “sensor means.” Pet. 10–12. Based on the evidence of record, we determine that Petitioner’s proposed constructions are the broadest reasonable interpretations of those terms and adopt them accordingly. All other terms will be accorded their ordinary and customary meaning as would be understood by one of ordinary skill at the time of the invention.

*“volume controlling means”*

Claim 23 depends from claim 19, which recites a “combined headphone set in accordance with claim 1, where each of said speaker headphones includes a pair of *stereo headphone driver units* in order to increase the volume/audio level when said speaker headphones are not positioned on the user’s head.” Ex. 1001, 12:5–9 (emphasis added). Claim 23 additionally recites “wherein each of said headphone driver units includes a *volume controlling means* for regulating and presetting the volume level for said exterior speakers and said interior speakers.” *Id.* at 12:23–26 (emphasis added). Petitioner contends, and we agree, that “volume controlling means” is a means-plus-function claim term under 35 U.S.C. § 112, paragraph 6, and that the claimed function is regulating and presetting the volume level for the exterior speakers and the interior speakers. Pet. 11. Petitioner also contends that the Specification does not identify any structure that corresponds to this function. *Id.* “If the specification does not contain an adequate disclosure of the structure that corresponds to the claimed function, the patentee will have failed to particularly point out and distinctly claim the invention as required by the second paragraph of section 112,

which renders the claim invalid for indefiniteness.” *Blackboard, Inc. v. Desire2Learn, Inc.*, 574 F.3d 1371, 1382 (Fed. Cir. 2009) (internal quotation marks omitted).

The Specification teaches that one embodiment of headphone set 10 includes driver unit 70 for interior speakers 42, 44, and driver unit 72 for exterior speakers 38, 40, with driver units 70, 72 including “volume controlling means” 71 and 73, respectively. Ex. 1001, 6:40–45, Fig. 2B.<sup>7</sup> According to the Specification, the volume controlling means are for presetting a maximum volume to each of the interior and exterior speakers, presumably to prevent hearing damage caused by excessively loud audio. *Id.* at 6:57–7:2. But the Specification does not describe or depict the structure that the volume controlling means uses to preset the maximum volume. Instead, it merely describes their function and depicts each of them as a box in a block diagram. *Id.* This is not sufficient because it does not “cabin the scope of the functional language in the means[-plus-function] element.” *ePlus, Inc. v. Lawson Software, Inc.*, 700 F.3d 509, 518–19 (Fed. Cir. 2012) (holding that a “black box” in a flow chart only represents a function without specifying structure). Accordingly, we agree with Petitioner that the ’966 patent Specification does not describe structure corresponding to the function of presetting a maximum volume to the interior and exterior speakers, rendering claim 23 indefinite.

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<sup>7</sup> Other embodiments may have more or fewer driver units for the internal and external speakers, but all of the disclosed embodiments have at least one volume controlling means associated with at least one driver unit. Ex. 1001, 6:45–64, Figs. 2C, 2D, 2E.

*B. Claims 1, 2, 5, 8–12, 16, 24, and 26 – Obviousness – Kuo and Awaba*

Petitioner contends that Kuo and Awaba renders unpatentable claims 1, 2, 5, 8–12, 16, 24, and 26 under 35 U.S.C. § 103(a). Kuo describes a multimedia speaker headphone with two ear-covers mounted on opposing sides of a headband. Ex. 1003, 1:34–41. Each ear-cover has an earphone speaker and an audio speaker. *Id.* at 1:41–42. Kuo Figure 1, reproduced below, illustrates this arrangement:

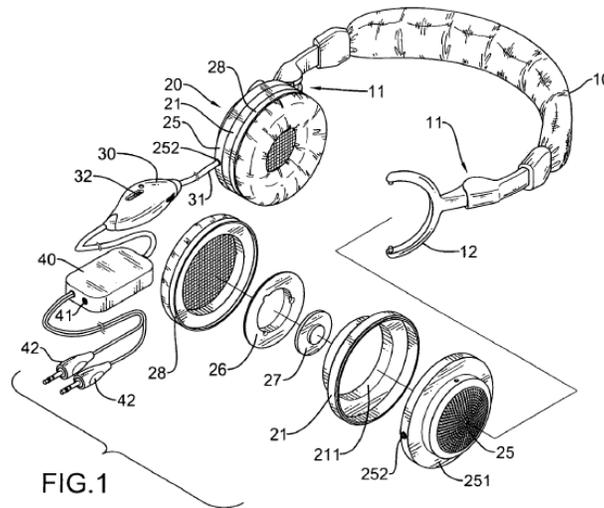


Figure 1, reproduced above, depicts one embodiment of Kuo's headphone. Ear-covers 20 are pivotally mounted on joint ends 11 of headband 10. *Id.* at 2:12–15. Each ear-cover contains audio speaker 25 and earphone speaker 27. *Id.* at 2:19–20. For each ear-cover, audio speaker 25 and earphone speaker 27 are mounted on the outside and inside, respectively, of annular hollow casing 21. Switch 32 is used to select earphone speakers 27 or audio speakers 25, the latter of which a user would select to listen to music or broadcast without having to wear the headphones. *Id.* at 3:27–36.

Awaba describes wearable entertainment device 12 that enables a user to listen to and produce sounds. The device comprises a pair of headphones 14, 16 on opposite ends of head band 18, and loud speaker 21 attached to the middle of head band 18. Ex. 1004, 3:27–4:4, Fig. 1. The housing for headphone 14 contains socket 24, which accepts audio cartridge or chip 26, or other form of data memory, on which music files may be stored. *Id.* at 4:10–13, Fig. 1. Mode switch 28 on headphone 16 switches the entertainment device such that monaural or stereo sound can be heard in one of three modes: through headphones 14 and 16, through speaker 21, or through both headphones and speaker 21. *Id.* at 4:25–36.

Patent Owner did not respond to the Petition. Thus, the only evidence of record for our consideration is presented in the Petition.<sup>8</sup> We have reviewed the record and, as discussed below, find that it establishes by a preponderance of the evidence that the combination of Kuo and Awaba renders obvious the combination of limitations of the subject claims.

*1. Claim 1*

For claim 1, we find that Kuo discloses a headphone set including a speaker headphone (ear covers 20) on opposing ends of a headband—each speaker headphone comprising an exterior speaker (audio speaker 25) and an interior speaker (earphone speaker 27)—and a signal wire connecting an audio device output to the speaker headphones. Ex. 1003, 2:8–20, 23–44, 53–59, 3:24–32, Figs. 1, 2. Kuo also discloses a switch that allows a user to listen to either the interior speakers or exterior speakers, although it does not describe the claimed three-way switch that also allows a user to

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<sup>8</sup> See 37 C.F.R. § 42.23(a) (“Any material fact not specifically denied may be considered admitted.”).

simultaneously listen to both interior and exterior speakers. *Id.* at 2:32–44, 3:27–29. We find, however, that Awaba discloses a three-way switch (mode switch 28) that permits a user to select between the three claimed listening modes. Ex. 1004, 2:5–12, 27–28, 4:30–36, Fig. 1. Further, a skilled artisan<sup>9</sup> would have considered Awaba’s three-way switch to be an obvious substitute for Kuo’s two-way switch because both are used for essentially the same purpose: to select between a headphone’s internal and external speakers on similar speaker-equipped headphones. The skilled artisan would have been motivated to make the substitution because Awaba’s three-way switch adds the additional functionality of being able to play both sets of speakers at the same time.

2. *Claims 2, 5, 8–12, 16, 24, and 26*

Claims 2, 5, 8–12, 16, 24, and 26 depend directly or indirectly from claim 1. We find that the combination of Kuo and Awaba teaches the additional limitations recited in these claims. Specifically, Kuo discloses the input jack, amplifier member, power source, headphone shape and audio-device connection of, respectively, claims 8–10, 12, and 16. Ex. 1003, 2:21–31, 37–39, 47–59, 3:4–32, Figs. 1, 2, 5–7. Kuo’s mounting of ear covers 20 at the joint ends 11 of headband 10 corresponds to the requirements of claim 5. *Id.* at 2:12–18, Fig. 2. Further, Awaba discloses the three-way switch of claims 2 and 11 and the electrical connections of claim 11 (Ex. 1004, 2:24–28, 4:25–36, Fig. 1); Awaba’s transmission of mono signals corresponds to

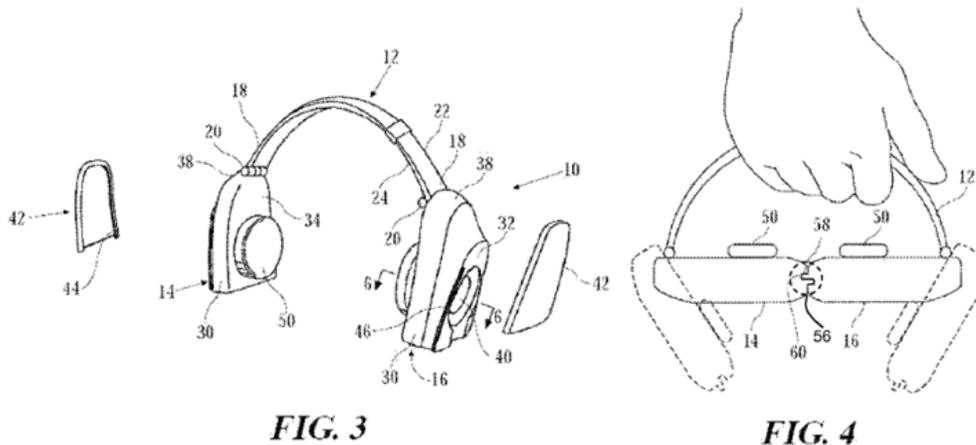
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<sup>9</sup> We find that the level of ordinary skill in the art is reflected by the prior art of record. *See Okajima v. Bourdeau*, 261 F.3d 1350, 1355 (Fed. Cir. 2001) (holding that the prior art itself can reflect the appropriate level of skill in the art).

the monaural system of claim 24 (*id.* at 4:26–29); and Awaba’s socket 24 corresponds to claim 26’s pocket (*id.* at 4:10–17). Adding these features to Kuo’s headphones would have constituted use of known techniques to improve similar devices (speaker-equipped headphones) in the same way. *See KSR Int’l Co. v. Teleflex, Inc.*, 550 U.S. 398, 417 (2007) (holding that “if a technique has been used to improve one device, and a person of ordinary skill in the art would recognize that it would improve similar devices in the same way, using the technique is obvious unless its actual application is beyond his or her skill”).

*C. Claims 3, 18, 19, 22, and 23—Obviousness—Kuo, Awaba, and Liow*

Petitioner contends that claims 3, 18, 19, 22, and 23 would have been obvious over the Kuo, Awaba, and Liow. Liow describes an “audio reproduction device that can be used both as a headphone and a loudspeaker.” Ex. 1005, 1:8–9. Liow Figures 3 and 4, reproduced below, illustrate Liow’s device:



Liow Figures 3 and 4 depict audio reproduction device 10 with audio reproduction modules 14 and 16 on opposite ends of head band 12. *Id.* at 3:24–33. Liow’s device may either be worn as a headphone, as shown in

Figure 3, or carried by head band 12 with modules 14 and 16 connected together, as shown in Figure 4, such that the device functions as a loudspeaker. *Id.* at 4:4–21.

1. *Claims 3 and 18*

Claim 3 depends from claim 1 and additionally requires that the speaker headphone assemblies include “wireless technology means having a wireless transmitter” to send the audio signal from an audio device to the headphones. Ex. 1001, 11:3–8. Claim 18 depends from claim 3 and specifies that the wireless technology means include “49 MHz, 900 MHz, 2.4 GHz, 5.8 GHz, Bluetooth, Infrared, wireless USB or 802.11b pathways.” *Id.* at 12:1–4. Liow teaches that its audio reproduction device may receive audio from an external source “wirelessly using, for example, Bluetooth, Wi-Fi, [or] infrared.” Ex. 1005, 4:40–55, Fig. 7. Liow’s device is similar to the headphones described in Kuo and Awaba. Thus, combining Liow with Kuo and Awaba “amounts to use of a known technique to improve a similar device in the same way,” and we determine that claims 3 and 18 would have been obvious over Kuo, Awaba, and Liow. Pet. 35.

2. *Claims 19 and 22*

Claim 19 depends from claim 1 and additionally requires that each speaker headphone assembly includes “a pair of stereo headphone driver units in order to increase the volume/audio level when said speaker headphones are not positioned on the user’s head.” Ex. 1001, 12:5–9. Claim 22 depends from claim 19 and requires that each speaker headphone have “at least two” headphone driver units. *Id.* at 12:20–24. Liow teaches that each audio reproduction module may have more than one “loud-speaker driver.” Ex. 1005, 3:44–50, 5:8–17, Fig. 7. Liow thus teaches the additional

limitations of claims 19 and 22. We agree with Petitioner that modifying the combination of Kuo and Awaba in accordance with Liow's teaching of multiple speaker drivers constitutes the use of a known technique to improve a similar device in the same way.

3. *Claim 23*

As discussed above, claim 23 depends from claim 19 and additionally requires that each headphone driver unit include "a volume controlling means for regulating and presetting the volume level for said exterior speakers and said interior speakers." Ex. 1001, 12:23–27. As discussed above, claim 23 is indefinite. Accordingly, we are unable to determine the scope of this claim or the differences between the claim and the prior art, and thus are unable to determine whether the claim would have been obvious over Kuo, Awaba, and Liow. *See In re Wilson*, 424 F.2d 1382, 1385 (CCPA 1970); *In re Steele*, 305 F.2d 859, 862–63 (CCPA 1962). Consequently, we cannot determine whether claim 23 is unpatentable "on the basis of prior art consisting of patents or printed publications." 35 U.S.C. § 311(b).

D. *Claim 17—Obviousness—Kuo, Awaba, and Amid-Hozour*

Claim 17 depends from claim 1 and further requires an audio signal wire connected from an audio device output jack to the input jacks of both speaker headphones. Ex. 1001, 11:63–66. Amid-Hozour describes a portable audio player with removable speakers, as shown in Figure 1, reproduced below:

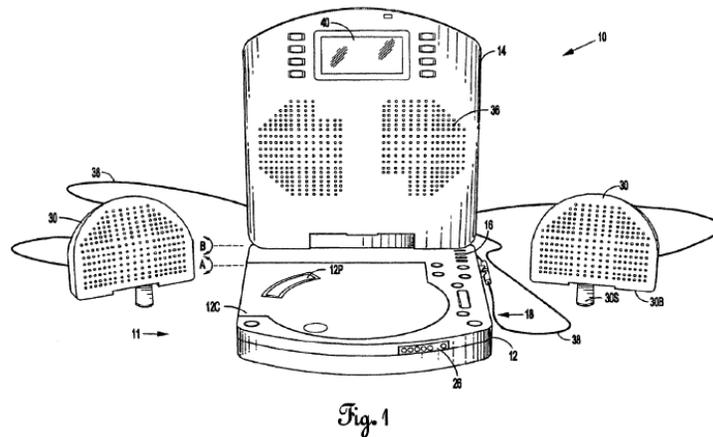


Figure 1 shows speakers 30 connected to the audio device via audio cables 38. Ex. 1006, 3:42–45, 3:53–4:6, Figs. 1, 3. We agree with Petitioner that Amid-Hozour teaches the additional limitation of claim 17. We also agree with Petitioner that combining Amid-Hozour with Kuo and Awaba amounts to the use of a known technique to improve a similar device in the same way.

*E. Claim 25—Obviousness—Kuo, Awaba, and Ambourn*

Claim 25 depends from claim 1 and further requires that one speaker headphone include “a signal pass-through port enabling a second user to plug-in their own headphone set in order to listen to the same audio source [from] the original user.” Ex. 1001, 12:33–37. Ambourn teaches an amplifier circuit that provides “a better perceived quality of sound when listening to a stereo audio signal with headphones,” and “provides capability for the sharing of the audio signal with another person using headphones by providing multiple output headphone jacks.” Ex. 1008, 2:52–56, 3:5–7. We find that Ambourn teaches claim 25’s signal pass-through port, and that combining Ambourn with Kuo and Awaba amounts to use of a known technique to improve a similar device in the same way.

*F. Claims 13 and 14, Obviousness over Kuo, Awaba, and Acker*

Claim 13 depends from claim 1 and additionally requires that “at least one of said speaker headphones include sensor means for detecting said headphone set on the user’s head.” Ex. 1001, 11:49–51. Claim 14 depends from claim 13 and additionally requires that said sensor means “include an infrared beam of light, an audio sensor signal or a pressure sensitive sensor.” *Id.* at 11:52–54. Acker describes a “presence sensor,” in the headset of an “audio-outputting device,” such as an mp3 player, that enables the audio-outputting device to determine if the headset is being worn by a user. Ex. 1009, 1. Acker’s sensor can be pressure-sensitive. *Id.* We find that Acker teaches the sensor means of claims 13 and 14, and that it would have been obvious to combine Acker with Kuo and Awaba because doing so amounts to use of a known technique to improve a similar device in the same way.

### III. CONCLUSION

Petitioner has shown by a preponderance of the evidence that claims 1–3, 5, 8–14, 16–19, 22, and 24–26 of the ’966 patent are unpatentable under 35 U.S.C. § 103(a).

### IV. ORDER

For the reasons given, it is

ORDERED that claims 1–3, 5, 8–14, 16–19, 22, and 24–26 of the ’966 patent are held unpatentable.

IPR2014-00365  
Patent 8,085,966 B2

This is a Final Decision. Parties to the proceeding seeking judicial review of the decision must comply with the notice and service requirements of 37 C.F.R. § 90.2.

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