

**UNITED STATES PATENT AND TRADEMARK OFFICE**

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**BEFORE THE PATENT TRIAL AND APPEAL BOARD**

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SAMSUNG ELECTRONICS CO., LTD.,  
Petitioner,

v.

ONE-E-WAY, INC.,  
Patent Owner.

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Case: IPR2025-01540  
U.S. Patent No. 10,129,627

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**PETITION FOR *INTER PARTES* REVIEW OF CLAIMS 1-12 OF  
U.S. PATENT NO. 10,129,627**

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Patent Trial and Appeal Board  
United States Patent and Trademark Office  
PO Box 1450  
Alexandria, Virginia 22313-1450  
*Submitted Electronically via P-TACTS*

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### **PETITIONER’S EXHIBIT LIST**

| <b>Exhibit No.</b> | <b>Description</b>                                                                                                                                                                                       |
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| 1001               | U.S. Patent No. 10,129,627 to Woolfork (“’627 patent”)                                                                                                                                                   |
| 1002               | File history of U.S. Application No. 15/003,242, filed January 21, 2016 (“the 2016 application”)                                                                                                         |
| 1003               | File history of U.S. Application No. 10/027,391, filed December 21, 2001 (“the 2001 application”), as originally filed in <i>Sony Corp. v. One-E-Way, Inc.</i> , IPR2016-01638 as Exhibit 1003           |
| 1004               | U.S. Publication No. 2003/0118196 (“the ’196-Publication”), as originally filed in <i>Sony Corp. v. One-E-Way, Inc.</i> , IPR2016-01638 as Exhibit 1004                                                  |
| 1005               | File history of U.S. Application No. 10/648,012, filed August 26, 2003 (“the 2003 application”), as originally filed in <i>Sony Corp. v. One-E-Way, Inc.</i> , IPR2016-01638 as Exhibit 1005             |
| 1006               | U.S. Patent No. 7,412,294, as originally filed in <i>Sony Corp. v. One-E-Way, Inc.</i> , IPR2016-01638 as Exhibit 1006                                                                                   |
| 1007               | Excerpts from file history of U.S. Application No. 12/144,729, filed July 12, 2008 (“the 2008 application”), as originally filed in <i>Sony Corp. v. One-E-Way, Inc.</i> , IPR2016-01638 as Exhibit 1007 |
| 1008               | Comparison of the 2003 application as-filed with the 2001 application as-filed, as originally filed in <i>Sony Corp. v. One-E-Way, Inc.</i> , IPR2016-01638 as Exhibit 1008                              |
| 1009               | Comparison of figures from the 2003 and 2001 applications as-filed, as originally filed in <i>Sony Corp. v. One-E-Way, Inc.</i> , IPR2016-01638 as Exhibit 1009                                          |
| 1010               | Comparison of the ’294 patent with the as-filed 2003 application, as originally filed in <i>Sony Corp. v. One-E-Way, Inc.</i> , IPR2016-01638 as Exhibit 1010                                            |
| 1011               | Comparison of the 2016 application as-filed with the 2008                                                                                                                                                |

| <b>Exhibit No.</b> | <b>Description</b>                                                                                                                                                                                  |
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|                    | application as-filed                                                                                                                                                                                |
| 1012               | Declaration of Michael Davies                                                                                                                                                                       |
| 1013               | <i>One-E-Way, Inc. v. Apple Inc.</i> , No. 2:20-cv-06339, Dkt. 86 (C.D. Cal. Mar. 9, 2022) (“Apple Markman order”)                                                                                  |
| 1014               | <i>In the Matter of Certain Consumer Elecs. And Display Devices with Graphics Processing and Graphics Processing Units Therein</i> , 337-TA-943, Order 12 (ITC July 24, 2015) (“ITC Markman order”) |
| 1015               | U.S. Patent No. 6,744,808 (“Walley”)                                                                                                                                                                |
| 1016               | U.S. Patent No. 5,546,424 (“Miyake”)                                                                                                                                                                |
| 1017               | Reserved                                                                                                                                                                                            |
| 1018               | “Wireless Communications: Principles & Practice” by Theodore S. Rappaport (1996) (“Rappaport”)                                                                                                      |
| 1019               | Reserved                                                                                                                                                                                            |
| 1020               | Reserved                                                                                                                                                                                            |
| 1021               | U.S. Patent No. 6,256,303 (“Drakoulis”)                                                                                                                                                             |
| 1022               | “The Communications Handbook” (1997) by Jerry D. Gibson (“Gibson”)                                                                                                                                  |
| 1023               | One-E-Way’s Opening Claim Construction Brief<br><i>One-E-Way, Inc. v. Apple Inc.</i> , 2:20-cv-6339-JSK-PD (D.I. 65) (C.D. Cal. Dec. 6, 2021)                                                       |
| 1024               | Order Re Motion For Summary Judgment of Non-Infringement (“Apple Summary Judgment Order”)<br><i>One-E-Way, Inc. v. Apple Inc.</i> , 2:20-cv-6339-JSK-PD (D.I. 102) (C.D. Cal. June 15, 2022)        |
| 1025               | Library of Congress Record for “Wireless Communications:                                                                                                                                            |

| Exhibit No. | Description                                                                                                                         |
|-------------|-------------------------------------------------------------------------------------------------------------------------------------|
|             | Principles & Practice” by Theodore S. Rappaport (1996)                                                                              |
| 1026        | U.S. Patent No. 5,933,421                                                                                                           |
| 1027        | Library of Congress Record for “The Communications Handbook” (1997)                                                                 |
| 1028        | U.S. Patent No. 5,953,669                                                                                                           |
| 1029        | Opinion Affirming <i>Apple</i> Summary Judgment Order<br><i>One-E-Way, Inc. v. Apple Inc.</i> , 2022-2020 (D.I. 32) (Aug. 14, 2023) |
| 1030        | <i>Curriculum Vitae</i> , Michael Allan Martin Davies                                                                               |

## CLAIM LISTING

| Claim or Element # | Claim Language                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |
|--------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| [1P]               | A wireless digital audio spread spectrum receiver, capable of mobile operation, configured to receive a unique user code and a high quality audio signal representation with a frequency range of 20 Hz to 20 kHz from a digital audio spread spectrum transmitter, said audio signal representation representative of audio from a portable audio source, said digital audio spread spectrum receiver operative to communicate wirelessly with said digital audio spread spectrum transmitter, said digital audio spread spectrum receiver comprising: |
| [1A]               | direct conversion module configured to receive wireless spread spectrum signal transmissions representative of the unique user code and the high quality audio signal representation, wherein the received transmissions are encoded to reduce intersymbol interference, wherein the wireless digital audio spread spectrum receiver is capable of processing the high quality audio signal having a frequency range of 20 Hz to 20 kHz;                                                                                                                |
| [1B]               | a digital-to-analog converter (DAC) configured to generate an audio output from said receiver audio signal representation; and                                                                                                                                                                                                                                                                                                                                                                                                                          |
| [1C]               | a speaker configured to reproduce said generated audio output, wherein said reproduction does not include audible audio content originating from any transmitted audio signals in the wireless digital audio spread spectrum transmitter spectrum that do not originate from said digital audio spread spectrum transmitter;                                                                                                                                                                                                                            |
| [1D]               | wherein the wireless digital audio spread spectrum receiver is configured to use independent code division multiple access communication and to use the received unique user code to communicate with only said wireless digital audio spread spectrum transmitter for the duration of a wireless connection; and                                                                                                                                                                                                                                       |
| [1E]               | wherein the wireless digital audio spread spectrum receiver is further configured to: demodulate a received modulated transmission, and                                                                                                                                                                                                                                                                                                                                                                                                                 |
| [1F]               | generate a demodulated signal based on the received modulated                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |

| Claim or Element # | Claim Language                                                                                                                                                                                                                                                                                                                                                                                                     |
|--------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|                    | transmission by performing at least one of a plurality of demodulations, wherein the plurality of demodulations includes a differential phase shift keying (DPSK) demodulation and also includes a non-DPSK demodulation.                                                                                                                                                                                          |
| [2]                | The wireless digital audio spread spectrum receiver of claim 1, wherein said audio from said portable audio source is music.                                                                                                                                                                                                                                                                                       |
| [3P]               | A portable spread spectrum audio receiver, configured to receive and store a unique user code, said portable spread spectrum receiver configured to receive wireless transmission from a spread spectrum transmitter, said wireless transmissions representative of a high quality audio signal representation with a frequency range of 20 Hz to 20 kHz, said portable spread spectrum audio receiver comprising: |
| [3A]               | a direct conversion module configured to receive wireless transmissions representative of the high quality audio signal representation, wherein the received wireless transmissions are encoded to reduce intersymbol interference;                                                                                                                                                                                |
| [3B]               | a decoder operative to decode the demodulated transmission and to generate a receiver audio signal representation, the decoder configured to decode reduced intersymbol interference coding and to decode representations of audio in the frequency range of 20 Hz to 20 kHz;                                                                                                                                      |
| [3C]               | a digital-to-analog converter (DAC) configured to generate an audio output from said receiver audio signal representation; and                                                                                                                                                                                                                                                                                     |
| [3D]               | a speaker configured to reproduce said generated audio output, wherein said reproduction does not include audible audio content originating from any transmitted audio signals in the spread spectrum transmitter spectrum that do not originate from said spread spectrum transmitter;                                                                                                                            |
| [3E]               | wherein the portable spread spectrum audio receiver is configured to use independent code division multiple access communication and to use the received unique user code to communicate with only said spread spectrum transmitter for the duration of a wireless connection;                                                                                                                                     |
| [3F]               | wherein the wireless digital audio spread spectrum receiver is further configured to perform at least one of a plurality of demodulations on a received modulation transmission and                                                                                                                                                                                                                                |

| Claim or Element # | Claim Language                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |
|--------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|                    | generate a demodulation signal based on the performance of the plurality of demodulations, wherein the plurality of demodulations includes a differential phase shift keying (DPSK) demodulation and a non-DPSK demodulation; and                                                                                                                                                                                                                                                                                                        |
| [3G]               | wherein said decoding is separate from said plurality of demodulations.                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |
| [4]                | The portable spread spectrum receiver of claim 3, wherein the audio signal representation represents music.                                                                                                                                                                                                                                                                                                                                                                                                                              |
| [5P]               | A wireless digital coded audio spread spectrum transmitter operatively coupled to a portable audio player and configured to transmit a unique user code and a representation of an audio signal with a frequency range of 20 Hz to 20 KHz, wherein said digital coded audio spread spectrum transmitter is configured to wirelessly communicate with a digital audio spread spectrum receiver and is configured to be moved in any direction during operation, said wireless digital coded audio spread spectrum transmitter comprising: |
| [5A]               | an encoder operative to encode a first representation of an audio signal to reduce intersymbol interference associated with a transmitted representation of the audio signal, said encoder configured to process signals in the frequency range of 20 Hz to 20 kHz for representation in said first representation of an audio signal;                                                                                                                                                                                                   |
| [5B]               | wherein the wireless digital coded audio spread spectrum transmitter is further configured to perform at least one of a plurality of modulations on the first representation of the audio signal and generate a modulated signal based on the performance of the plurality of modulations, wherein the plurality of modulations includes a differential phase shift keying (DPSK) modulation and a non-DPSK modulation;                                                                                                                  |
| [5C]               | wherein said plurality of modulations are separate from the encoding and processing by the encoder; and                                                                                                                                                                                                                                                                                                                                                                                                                                  |
| [5D]               | wherein the wireless digital coded audio spread spectrum transmitter is further configured to use the modulated signal and to use independent code division multiple access communication to wirelessly transmit a transmitted representation of the audio signal, and wherein the transmitted                                                                                                                                                                                                                                           |

| Claim or Element # | Claim Language                                                                                                                                                                                                                                                                                                                                                                      |
|--------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|                    | unique user code distinguishes the transmitted representation of the audio signal from other transmitted audio signals in the spread spectrum transmitter spectrum, said other transmitted audio signals not originating from said wireless digital coded audio spread spectrum transmitter.                                                                                        |
| [6]                | The wireless digital coded audio spread spectrum transmitter of claim 5, wherein the first representation of an audio signal is representative of music.                                                                                                                                                                                                                            |
| [7]                | The wireless digital audio spread spectrum receiver of claim 1, wherein said non-DPSK demodulation is 64-ary demodulation.                                                                                                                                                                                                                                                          |
| [8]                | The portable spread spectrum receiver of claim 3, wherein said non-DPSK demodulation is 64-ary demodulation.                                                                                                                                                                                                                                                                        |
| [9]                | The wireless digital coded audio spread spectrum transmitter of claim 5, wherein said non-DPSK modulation is 64-ary modulation.                                                                                                                                                                                                                                                     |
| [10]               | The wireless digital audio spread spectrum receiver of claim 1, wherein the digital audio spread spectrum receiver is further configured to receive the receive wireless spread spectrum signal transmissions where the receive wireless spread spectrum signal transmissions are in the Industrial Scientific and Medical 2.4 GHz band, ranging from 2.4 GHz to 2.5 GHz.           |
| [11]               | The portable spread spectrum receiver of claim 3, wherein the portable spread spectrum receiver is further configured to receive the received wireless transmissions where the received wireless transmissions are in the Industrial Scientific and Medical 2.4 GHz band, ranging from 2.4 GHz to 2.5 GHz.                                                                          |
| [12]               | The wireless digital coded audio spread spectrum transmitter of claim 5, wherein wireless digital coded audio spread spectrum transmitter is further configured to transmit the transmitted representation of the audio signal where the transmitted representation of the audio signal are in the Industrial Scientific and Medical 2.4 GHz band, ranging from 2.4 GHz to 2.5 GHz. |

Samsung Electronics Co., Ltd. (“Petitioner”) petitions for *inter partes* review of claims 1-12 (“Challenged Claims”) of U.S. Patent No. 10,129,627.

## I. OVERVIEW

The '627 patent relates to a wireless digital audio system.

Figure 1 depicts music audio source 80 connected to a battery powered wireless transmitter 20.

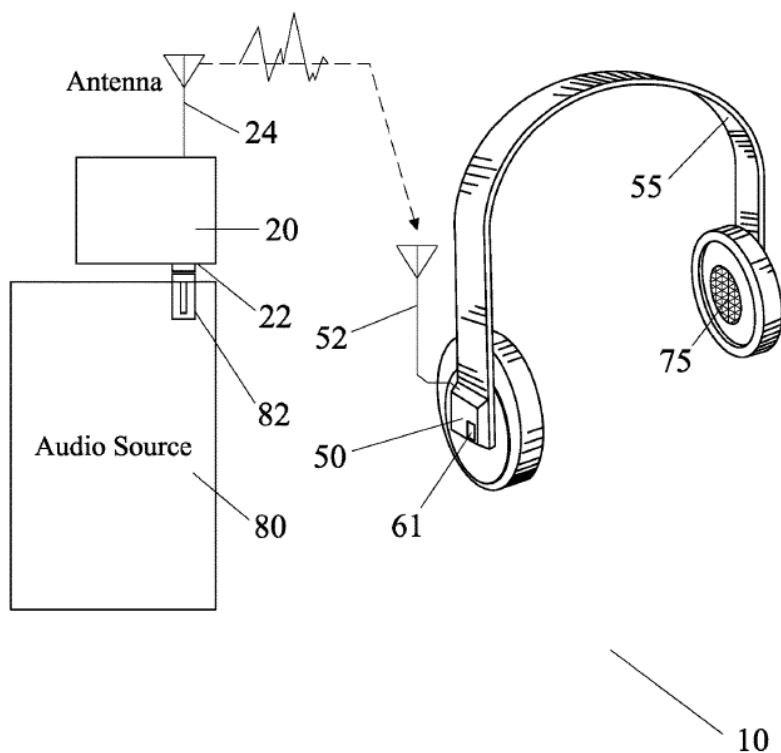


FIG. 1

Code generator 44 generates a unique user code associated with one wireless user. EX1001, 2:53-3:6.

A spread spectrum modulated signal is received by the antenna 52 and

processed by spread spectrum direct conversion receiver or module 56. EX1001, 3:7-41, 4:28-39.

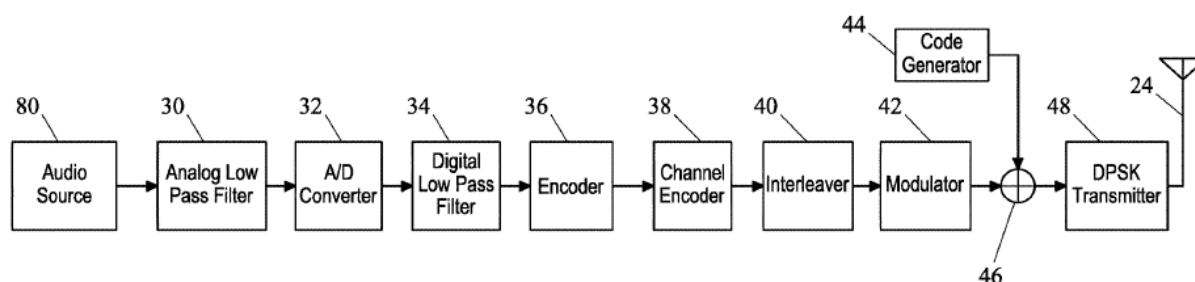


FIG. 2

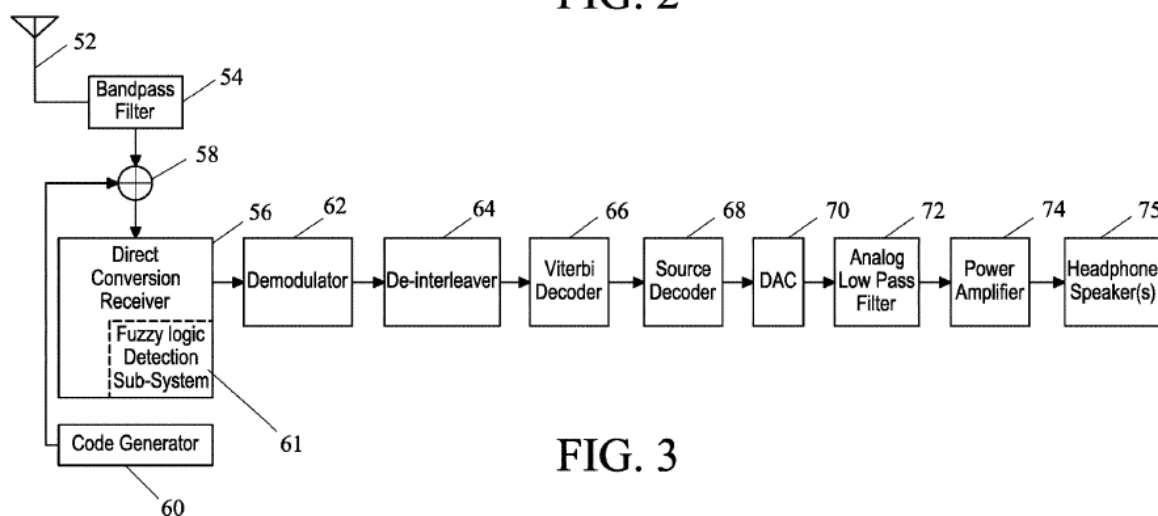


FIG. 3

## II. REQUIREMENTS FOR IPR

### A. Standing

The petition is filed within one year of service of a complaint asserting the '627 patent. Estoppel does not bar this Petition.

### B. Challenge and Relief Requested

Petitioner requests cancellation of the Challenged Claims based on the following grounds:

| Ground | Claims | Basis                                                                                                                       |
|--------|--------|-----------------------------------------------------------------------------------------------------------------------------|
| 1      | 1-12   | Rendered obvious by '196-Publication (EX1004)                                                                               |
| 2      | 1-12   | Rendered obvious by Walley (EX1015) in view of Miyake (EX1016), Gibson (EX1022), and Rappaport (EX1018)                     |
| 3      | 1-12   | Rendered obvious by Walley (EX1015) in view of Miyake (EX1016), Gibson (EX1022), Rappaport (EX1018), and Drakoulis (EX1021) |

### C. Claim Construction

Petitioner submits that terms should be construed according to the *Phillips* standard. *Phillips v. AWH Corp.*, 415 F.3d 1303 (Fed. Cir. 2005). In a related proceeding involving the '627 patent, *One-E-Way, Inc. v. Apple Inc.*, No. 2:20-cv-06339 (C.D. Cal.) (“the *Apple* Action”), the District Court for the Central District of California construed certain terms of the '627 patent as set forth in the table below:

| Term                                                                      | Construction                                                                                                                                  |
|---------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------|
| “reduce[d] intersymbol interference”                                      | “coding that reduces intersymbol (inter-symbol) interference”                                                                                 |
| The term “independent” in the context of “independent” CDMA communication | “performed independent of any central control”                                                                                                |
| “unique user code”                                                        | “fixed code (bit sequence) specifically associated with one user of a device(s)”                                                              |
| “direct conversion module”                                                | “module for converting radio frequency to baseband or very near baseband in a single frequency conversion without an intermediate frequency.” |
| “audio player”                                                            | “a device for playing audio that has an analog headphone jack”                                                                                |

|                |                                                                                                       |
|----------------|-------------------------------------------------------------------------------------------------------|
| “audio source” | “a device for providing audio that has an analog headphone jack”                                      |
| “transmitter”  | “a device that can be connected into an analog headphone jack to wirelessly transmit an audio signal” |

EX1013, pp.8, 20. Petitioner requests that these terms be construed as provided in the *Apple* Action. *Id.* The remaining claim terms should be construed in accordance with their plain and ordinary meaning.

### **III. THE CHALLENGED CLAIMS ARE UNPATENTABLE**

#### **A. Person of Ordinary Skill in the Art**

A person of ordinary skill in the art of the '627 patent has a Bachelor of Science degree in electrical engineering or a related field, and approximately two years of experience in the design or implementation of wireless communications systems, or the equivalent. Alternatively, a person of ordinary skill in the art has approximately six years of experience in the design or implementation of wireless communications systems, or the equivalent.<sup>1</sup>

#### **B. Effective Filing Date of the Challenged Claims**

Each application in the '627 patent family claims priority to the prior applications in the chain. Merely claiming priority, however, is not sufficient for a

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<sup>1</sup> This is the level of skill proposed by Petitioner and adopted by the Administrative Law Judge in the ITC action. EX1014, pp.7-9.

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claim to obtain the benefit of an earlier filing date for purposes of, *e.g.*, overcoming prior art. For the '627 patent claims to be entitled to the priority date of the earliest application in the chain, *i.e.*, the 2001 application, every application between the '627 patent and that application must maintain disclosure that supports the claims.

Here, the applicant broke the chain of disclosure in 2003 by filing a continuation-in-part ("CIP") application, EX1005, directed to a different invention than that of the '627 claims. The 2003 application did not include or incorporate by reference the disclosure of the earlier 2001 application, and the applicant's subsequent amendments to the 2003 application's specification and figures cannot cure the break in the chain because the amendments were not supported by the 2003 application's disclosure as filed, and thus improperly introduced new matter.

Notably, Sony Corporation filed an IPR petition with respect to a related patent, U.S. Patent No. 9,282,396, and argued that the challenged claims were invalid in view of the '196-Publication due to the break in the chain of disclosure in the 2003 application. *Sony Corp. v. One-E-Way, Inc.*, IPR2016-01638 ("*Sony IPR*"), Paper 12 at 5-13. The PTAB concluded that Sony had "shown sufficiently that the [2003] application failed to maintain continuity of disclosure with the [2001] application, and, as a result, the [later, related] patent is not entitled to the benefit of the filing date of the [2003] application or the [2001] application" and instituted review. *Id.*, 12-13, 17. The parties settled after the oral hearing but before a final

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written decision issued. *Sony IPR*, Papers 38, 39.

PO bears the ultimate burden of demonstrating entitlement to an earlier application's filing date. *See In re NTP, Inc.*, 654 F.3d 1268, 1276-77 (Fed. Cir. 2011). This burden is not satisfied simply because the later application is a "continuation" or a "continuation-in-part" of the earlier one. *See Rsch. Corp. Techs., Inc. v. Microsoft Corp.*, 627 F.3d 859, 865, 869-70 (Fed. Cir. 2010). If the earlier application is not an immediate parent, "in order to gain the benefit of the filing date of an earlier application under 35 U.S.C. §120, each application in the chain leading back to the earlier application must comply with the written description requirement of 35 U.S.C. §112," maintaining continuity of disclosure throughout the chain. *Zenon Env't, Inc. v. U.S. Filter Corp.*, 506 F.3d 1370, 1378–82 (Fed. Cir. 2007).

PO must show that the claimed invention was disclosed in the earlier applications as originally filed. 35 U.S.C. §120 (2012); *see Anascape, Ltd. v. Nintendo of Am., Inc.*, 601 F.3d 1333, 1337 (Fed. Cir. 2010). Regardless of whether the claim limitations of the later invention may be obvious from the prior disclosure, they must appear in the specification of the earlier application to get the earlier priority date. *See Lockwood*, 107 F.3d at 1571-72.

Incorporation by reference can maintain continuity of disclosure. It "provides a method for integrating material from various documents into a host document ... by citing such material in a manner that makes clear that the material is effectively

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part of the host document as if it were explicitly contained therein.” *Zenon*, 506 F.3d at 1378. However, claiming priority as a CIP (or continuation or divisional) of a parent application is not an incorporation by reference of a prior application. *See Ex Parte MacLeod*, 2003 WL 25277951, at \*7-8 (No. 2001-1651, B.P.A.I. Sept. 4, 2003); *In re De Seversky*, 474 F.2d 671, 674 (C.C.P.A. 1973); MPEP 201.06(c)(IV). Further, an incorporation-by-reference statement cannot be added after the application’s filing date. 35 U.S.C. §132; MPEP 201.06(c)(IV).

*I. The 2001 Application*

On December 21, 2001, the earliest application to which the ’627 patent claims priority, entitled “Wireless Digital Audio System,” was filed and assigned U.S. Application No. 10/027,391 (“the 2001 application”). EX1003, p.3.

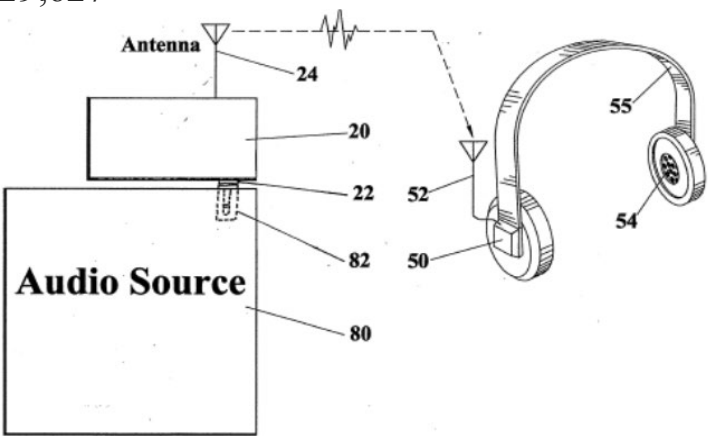


**FIG.1**

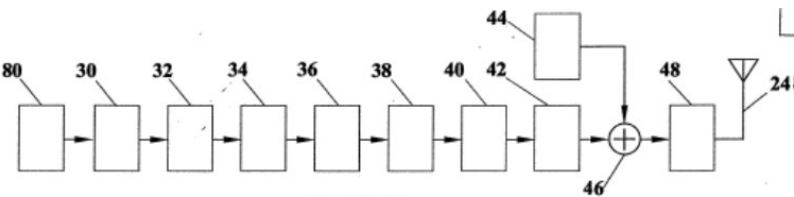


**FIG.2**

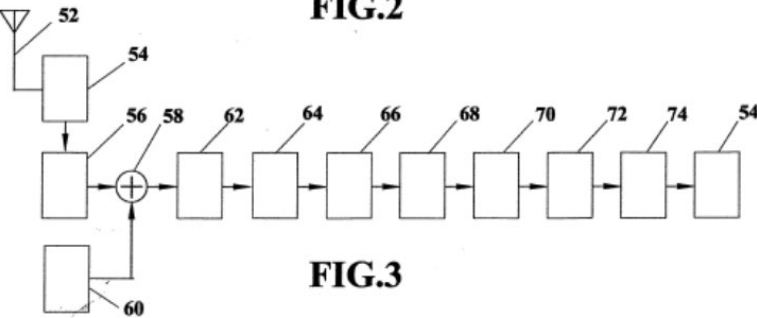


**FIG.3**

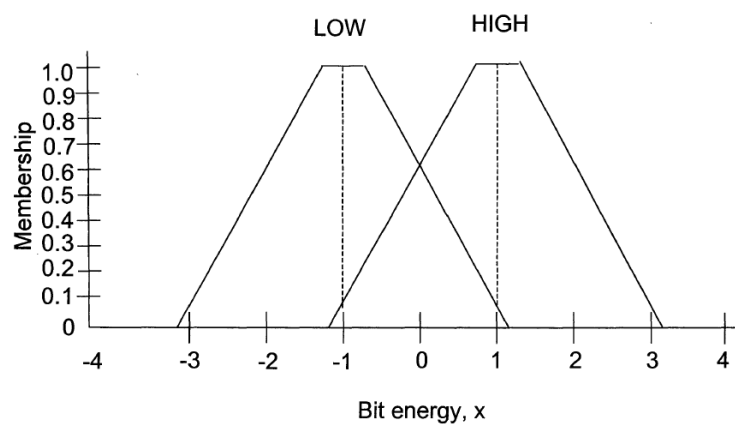
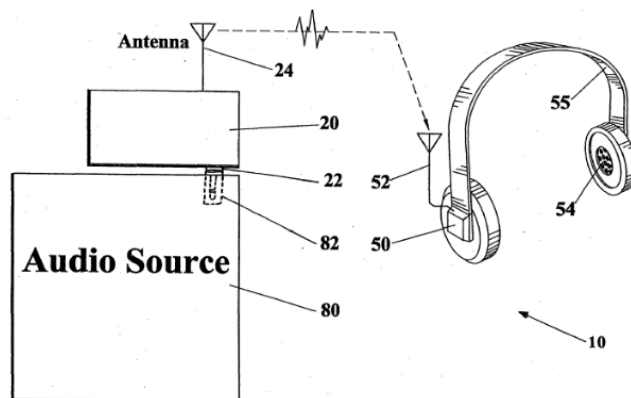
The 2001 application states that “[t]he present invention is directed to wireless digital audio systems for transmission of a signal from an audio player device to a headphone.” *Id.*, p.6. The 2001 application describes a wireless digital audio system, including that “encoder 36 may be used to reduce intersymbol interference (ISI) by using a transform code to encode the digital signal”; “differential phase shift key (DPSK) transmitter 48 [] modulates the digital signal to be transmitted”; and “direct conversion receiver 56 may provide a method for down converting the received signal.” *Id.*, pp.8-9. Figures 2 and 3 include functional block diagrams showing the components, including the encoder 36, DPSK transmitter 48, and direct conversion receiver 56, and operational flow of the audio transmitter and audio receiver, respectively. *Id.*, p.22.

The examiner rejected all claims in the 2001 application on September 6, 2002 as obvious in view of certain prior art. *Id.*, pp.26-36. Following the applicant canceling claims 1 and 2 and attempting to argue over the rejection, the examiner again rejected the remaining claims on February 26, 2003 as obvious in view of the prior art. *Id.*, pp.49-57. Rather than respond to this rejection, on August 27, 2003, the applicant expressly abandoned the 2001 application in favor of a CIP application. *Id.*, p.60.

On June 26, 2003, shortly before abandonment, the 2001 application published as the '196-Publication. EX1004.

2. *The 2003 Application*

On August 26, 2003, the applicant filed a CIP application directed to a different invention, entitled “Fuzzy Audio Wireless Music System,” assigned U.S. Application No. 10/648,012 (“the 2003 application”). EX1005.



Critically, the 2003 application claimed priority to the 2001 application as a CIP, *but did not* incorporate by reference the 2001 application. The 2003 application as filed also differs substantially from the 2001 application. While figure 1 of both applications are nearly identical, figure 2 of the 2003 application differs from figures 2 and 3 of the 2001 application, which are not included in the 2003 application. *See* EX1009. In addition, the wireless audio system described in the 2003 application specification differs significantly from that described in the 2001 application. *See* EX1008.

For example, the 2003 application's "Summary of the Invention" states, "[t]he present invention is directed to FAWM (Fuzzy Audio Wireless Music) systems for coded digital transmission of an audio signal from any audio player device with a headphone jack to a receiver headphone using fuzzy logic technology." EX1005, 0004. Unlike the 2001 application, the 2003 application does not disclose or describe a direct conversion receiver, differential phase shift keying, intersymbol interference, or an encoder to reduce it. *Id.*, 0005-0008. The 2003 application figures also contain no functional block diagrams showing the components or operation of the fuzzy audio wireless music system of the invention. *Id.*, 0014-0015.

3. *The 2003 Application As Filed Does Not Support the '627 Patent Claims.*

For the '627 patent claims to be entitled to the 2001 application's filing date,

PO must show that each application in the chain leading back to December 2001—including the 2003 application—complies with the written description requirement of 35 U.S.C. §112. *See Lockwood*, 107 F.3d at 1571-72. An earlier application supports a claim if the application as originally filed describes the invention with sufficient detail. *See Anascape*, 601 F.3d at 1337; MPEP §2163.05 .

The originally filed 2003 application does not support the claims of the '627 patent. The '627 patent claims recite, *inter alia*, reduced “intersymbol interference” (cls. 1-12) and “a direct conversion module” (cls. 1-4). EX1001. In addition, independents claim 1, 3, and 5 recite “differential phase shift keying (DPSK).” *Id.* None of these limitations are even inherently described in the 2003 application as originally filed. *See* EX1012, ¶¶81-82. As a result, the '627 patent claims are not entitled to the 2001 application filing date; the 2003 application, as filed, broke the chain of disclosure.

4. *Applicant's Amendments to the 2003 Application Cannot Establish a 2001 or 2003 Priority Date.*

As noted above, the applicant failed to incorporate by reference the 2001 application in the originally filed 2003 application. Instead, the applicant amended the 2003 application on August 15, 2006 to incorporate by reference of the 2001 application. EX1005, 0375.

An incorporation by reference statement added nearly three years after filing the 2003 application constitutes improper new matter and is, therefore, ineffective

in establishing continuity of disclosure back to the 2001 application. MPEP §201.06(c)(IV).<sup>2</sup> December 21, 2001 cannot be the priority date of the '627 patent claims.

In fact, no matter added after the original disclosure is filed may be used to provide written description support. *Anascape*, 601 F.3d at 1337; MPEP §2163.05. In October 2004, more than a year after filing the 2003 application,<sup>3</sup> the applicant began extensively amending the specification and figures of the 2003 application, both to add and remove material. Over the next two years, in addition to the August 2006 incorporation by reference of the 2001 application, amendments included:

- Adding description that the FAWM system utilized Bluetooth technology, including that the transmitter and the receiver are a Bluetooth compliant transmitter and receiver (EX1005, 0025-34);
- Broadening the disclosure by removing specifics, including removing the statement that “[t]he fuzzy logic detector is the key component to the FAWM system 10.” (EX1005, 0029);
- Changing the application title from “Fuzzy Audio Wireless Music System” to “Wireless Digital Audio Music System” (EX1005, 0076);
- Removing all references to “FAWM” and replacing them with “wireless digital audio music” (EX1005, 0076-84);
- Adding new figures 2 and 3 and heavily editing the original figure 2 from the 2003 application into new figure 4 (EX1005, 0086, 0093-95);

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<sup>2</sup> The CIP priority claim in the 2003 application is not an incorporation by reference of the 2001 application. *In re De Seversky*, 474 F.2d 671, 674 (C.C.P.A. 1973).

<sup>3</sup> And more than a year after the 2001 application published in June 2003.

- Adding a description of a “direct conversion receiver 56” to the specification (EX1005, 0287);
- Adding a “direct conversion receiver 56” to figure 3 (EX1005, 0296, 0307); and
- Adding a description of a “DPSK (differential phase shift key) transmitter” to the specification (EX1005, 0377).

The examiner objected to many of these amendments under 35 U.S.C. §132 as introducing new matter, but allowed others.<sup>4</sup> By the time the 2003 application issued as U.S. Patent No. 7,412,294 (EX1006) on August 12, 2008, the specification and figures were completely different from the as-filed 2003 application. EX1010.

Regardless of the amendments, the priority-date analysis is properly conducted based on the 2003 application as filed, which does not support the '627 claims. Thus, August 26, 2003 cannot be the priority date of the '627 patent claims.

5. *July 12, 2008 is the Earliest Priority Date to Which the '627 Claims Are Entitled.*

As discussed above in Sections III.B.1-4, the '627 patent claims are not entitled to the benefit of the filing date of the 2001 application or of the 2003 application because the 2003 application broke the chain of disclosure, and the 2003

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<sup>4</sup> The applicant cited the 2001 application as support for amendments to the 2003 application even though no incorporation by reference had been made. *See, e.g.*, EX1005, 0076, 0263. This was improper, and it was a material error by the examiner to accept this support. All new matter amendments, including additions from the 2001 application's specification and figures, should have been rejected.

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application fails to support the '627 claims. *See Lockwood*, 107 F.3d at 1571-72; *Ex Parte MacLeod*, 2003 WL 25277951, at \*7-8. No other applications in the family were ever co-pending with the 2001 application. The earliest priority date to which the '627 claims are entitled is thus July 12, 2008, the filing date of the 2008 application, because the as-filed specification of the '627 patent is substantially the same as the as-filed specification of the 2008 application. EX1011.

### **C. Prior Art Overview**

Each prior art reference relied upon below is in the same field of endeavor as the '627 patent. EX1012, ¶¶88-89, 90-91, 92-93, 94-95, 96-97, 98-99.

#### *1. '196-Publication (EX1004)*

The '196-Publication is U.S. Patent Appl. Pub. 2003/0118196, published June 26, 2003. The '196-Publication is at least pre-AIA §102(b) prior art.

The '196-Publication is directed to “wireless digital audio systems for transmission of a signal from an audio player device to a headphone.” EX1004, Abstract.

#### *2. Rappaport (EX1018)*

Rappaport is a book titled “Wireless Communications: Principles & Practice” by Theodore S. Rappaport, which published in 1996. EX1012, ¶90. Rappaport is at least pre-AIA §102(b) prior art. Rappaport “provides extensive coverage of the most common analog and digital modulation techniques used in mobile communications.” *Id.*, xiv.

3. *Walley (EX1015)*

Walley is U.S. Patent No. 6,744,808, which was filed June 3, 1999 and issued June 1, 2004. Walley is at least pre-AIA §102(e) prior art. Walley discloses a CDMA system that uses a “spreading code[]” (“commonly referred to as Pseudo Noise (PN) codes”) which Walley discloses as a “a dedicated code that is used to separate that system’s transmissions from all others.” EX1015, 1:27-59.

4. *Miyake (EX1016)*

Miyake is U.S. Patent No. 5,546,424, which was filed June 27, 1994 and issued August 13, 1996. Miyake is at least pre-AIA §102(b) prior art. Miyake describes a “spreading code” based on a code “specific to [an] individual user” and a code “assigned according to ... attributes.” EX1016, 5:49-56; *see also id.*, 8:12-60.

5. *Gibson (EX1022)*

Gibson is titled “The Communications Handbook” by Jerry D. Gibson, which published in 1997. EX1012, ¶96. Gibson is at least pre-AIA §102(b) prior art. Gibson is a handbook that outlines the “Basic Principles” of a communication system.

6. *Drakoulis (EX1021)*

Drakoulis is U.S. Patent No. 6,256,303, which was filed October 15, 1999 and issued July 3, 2001. Drakoulis is at least pre-AIA §102(a) prior art..

Drakoulis is directed to an apparatus with a “base unit 22” coupled “via jacks

or connectors and electrical conductors to the signal source 10,” which may include “a CD player, AM/FM tuner, tape deck, turntable, etc.” EX1021, 5:21-25, 5:34-37.

**D. Ground 1: The ’196-Publication Renders Obvious Claims 1-12.**

*I. Claim 1*

- a. [1P] A wireless digital audio spread spectrum receiver, capable of mobile operation, configured to receive a unique user code and a high quality audio signal representation with a frequency range of 20 Hz to 20 kHz from a digital audio spread spectrum transmitter, said audio signal representation representative of audio from a portable audio source, said digital audio spread spectrum receiver operative to communicate wirelessly with said digital audio spread spectrum transmitter, said digital audio spread spectrum receiver comprising:

The ’196-Publication renders obvious this limitation. EX1012, ¶¶106-123.

The ’196-Publication teaches “wireless digital audio systems for transmission of a signal from an audio player to a headphone.” EX1004, Abstract. “[A]udio receiver 50...may be a headphone receiver” and is thus *a wireless digital audio receiver, capable of mobile operation. Id.*, ¶[0011]; *see also id.*, Fig. 1.

The term “transmitter” should be construed to mean “a device that can be connected into an analog headphone jack to wirelessly transmit an audio signal” and the term “audio source” should be construed to mean “a device for providing audio that has an analog headphone jack.” §II.C. The ’196-Publication discloses that an “audio transmitter 20 may be connected to the audio source 80 headphone jack 82 using a headphone plug 22.” *Id.*, ¶[0011], FIG. 1. The ’196-Publication further

discloses “portable player systems such as cassette tape players...having a headphone jack to which a headphone is connected by wire and connector.” *Id.*, ¶[0002]; *see also id.*, ¶¶[0002] (“audio player devices such as radio, tape players, CD players.”), [0003]-[0004]; EX1012, ¶¶112-115. Thus, the ’196-Publication teaches a *transmitter* (“audio transmitter 20”) and an *audio signal representation representative of audio from a portable audio source* (“audio player or audio source 80”). EX1012, ¶¶112-117.

“[A]udio source 80 normally provides an analog output signal in the approximate range of 20 Hz to 20 kHz.” *Id.*, ¶[0012]. Audio transmitter includes “a transmitter code generator 44 signal to produce...a unique codeword that spreads the signal spectrum” of the transmission to audio receiver. *Id.*, ¶[0014]. Furthermore, Audio receiver 50 receives the transmission and includes “receiver code generator 60 [that] may contain the same unique code word that was transmitted by the audio transmitter 20 specific to a particular a user” to demodulate the transmission. *Id.*, ¶[0016]. Thus, audio receiver 50 is *configured to receive a unique user code* (“unique codeword”) *and [an] audio signal representation with a frequency range of 20 Hz to 20 kHz from a digital audio spread spectrum transmitter and is operative to communicate wirelessly with said digital audio spread spectrum transmitter.*

As explained in Section II.C above, the term “high quality audio signal representation” should be construed to mean a “high fidelity, low distortion audio

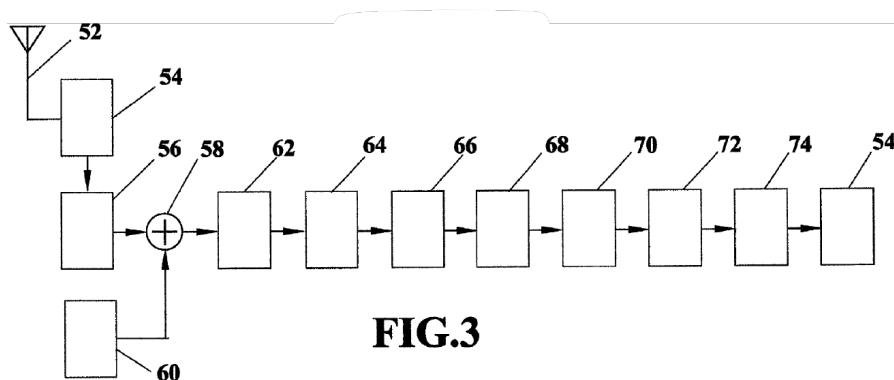
signal representation.” Audio receiver 50 is configured to receive a *high quality audio signal representation with a frequency range of 20 Hz to 20 kHz*. EX1012, ¶¶120-121. The receiver includes “analog low pass filter 72 [that] may be used to filter the analog audio signal to pass a signal in the approximate 20 Hz to 20 kHz frequency range and filter other frequencies.” *Id.*, ¶¶[0018], [0012]. “The analog audio signal may then be processed by a power amplifier 74 that may be optimized for powering a headphone speaker 54 to optimize **a high quality, low distortion signal** for hearing by a user wearing the headphones 55.” *Id.*

- b. [1A] direct conversion module configured to receive wireless spread spectrum signal transmissions representative of the unique user code and the high quality audio signal representation, wherein the received transmissions are encoded to reduce intersymbol interference, wherein the wireless digital audio spread spectrum receiver is capable of processing the high quality audio signal having a frequency range of 20 Hz to 20 kHz;

The '196-Publication renders obvious this limitation. EX1012, ¶¶124-133.

As explained in Section II.C, the term “direct conversion module” should be construed to mean a “module for converting radio frequency to baseband or very near baseband in a single frequency conversion without an intermediate frequency” and “[reduce/reduction of] intersymbol interference coding” should be construed to mean “coding that reduces intersymbol (inter-symbol) interference.” The '196-Publication discloses a “direct conversion receiver 56 [that] may provide a method

for down converting the received signal.” EX1004, ¶[0015]. In a parallel proceeding, PO argued that “a POSITA would understand that a ‘direct conversion’ receiver includes near-zero intermediate frequency (NZIF) receivers that convert to very near baseband in a single frequency conversion without an intermediate frequency.” EX1023, 18. As depicted below “audio receiver 50” includes “direct conversion receiver 56”:



EX1004, FIG. 3, ¶[0009] (“FIG. 3 illustrates a functional block diagram of the audio receiver”). Thus, the ’196-Publication teaches a *direct conversion module* (“direct conversion receiver 56”). EX1012, ¶126.

The ’196-Publication explains that the audio signal may be modulated “using direct sequence spread spectrum communication technology.” EX1004, ¶[0014]. Audio transmitter includes “a transmitter code generator 44 signal to produce...a unique codeword that spreads the signal spectrum” of the transmission to audio receiver. *Id.*, ¶[0014]. The ’196-Publication discloses that “direct conversion receiver 56” receives a “spread spectrum signal” transmitted from “audio transmitter

20.” *Id.*, ¶[0015]. “The direct conversion receiver 56 may provide a method for...utilizing timing and synchronization to capture the correct bit sequence embedded in the received spread spectrum signal.” *Id.* “The receiver code generator 60 may contain the same **unique code word that was transmitted by the audio transmitter 20** specific to a particular a user.” EX1004, ¶[0016]. Thus, the ’196-Publication teaches *spread spectrum signal transmissions* (“spread spectrum signal”) *representative of the unique user code* (“unique codeword”) *and the ... audio signal representation* (audio signal prior to being modulated with the unique codeword). EX1012, ¶128.

Audio receiver 50 comprises “source decoder 68” to “decode the coding applied by the encoder 36” and thus processes the received audio signal for reduction of ISI. EX1004, ¶[0017].

Audio transmitter includes “encoder 36...to reduce intersymbol interference (ISI) by using a transform code to encode the digital signal” (*coding that reduces intersymbol (inter-symbol) interference*) and thus provides *audio transmissions [that] are encoded to reduce intersymbol interference*. EX1004, ¶[0013]. The transmitter further includes “a transmitter code generator 44 signal to produce...a unique codeword that spreads the signal spectrum.” *Id.*, ¶[0014].

The receiver further includes “analog low pass filter 72 [that] may be used to filter the analog audio signal to pass a signal in the approximate 20 Hz to 20 kHz

frequency range and filter other frequencies.” *Id.*, ¶[0018]. “The analog audio signal may then be processed by a power amplifier 74 that may be optimized for powering a headphone speaker 54 to optimize a high quality, low distortion signal for hearing by a user wearing the headphones 55.” *Id.* Thus, the ’196-Publication renders obvious *the high quality audio signal representation* (received “spread spectrum signal” which can be processed back to a “high quality, low distortion signal”),... *wherein the wireless digital audio spread spectrum receiver is capable of processing the high quality audio signal having a frequency range of 20 Hz to 20 kHz.* EX1012, ¶¶131-132; *see* [3B].

- c. [1B] a digital-to-analog converter (DAC) configured to generate an audio output from said receiver audio signal representation; and;

The ’196-Publication renders obvious this limitation. EX1012, ¶¶134-136.

Audio receiver 50 includes “[a] digital-to-analog converter 70 (DAC) [that] may be used to transform the digital signal to an analog audio signal.” EX1004, ¶[0018].

- d. [1C] a speaker configured to reproduce said generated audio output, wherein said reproduction does not include audible audio content originating from any transmitted audio signals in the wireless digital audio spread spectrum transmitter spectrum that do not originate from said digital audio spread spectrum transmitter;

The ’196-Publication renders obvious this limitation. EX1012, ¶¶137-139.

The ’196-Publication indicates that the use of “code division multiple access

(CDMA) may be used to provide each user independent operation.” *Id.*, ¶[0016].

The ’196-Publication explains that the unique user code allows a receiver to identify transmissions from audio transmitter 20 that are “specific to a particular ... user” while “[o]ther code words from wireless digital audio systems 10 may appear as noise.” *Id.*

A POSA would thus understand that audio receiver 50 would selectively receive transmissions from audio transmitter 20 (*said digital audio spread spectrum transmitter*) and *does not include audible audio content originating from any transmitted audio signals in the wireless digital audio spread spectrum transmitter spectrum that do not originate from said digital audio spread spectrum transmitter*. EX1012, ¶¶138-139. The ’196-Publication explains that these transmissions are then demodulated and processed to “return the signal to analog or base band format for use in powering a speaker 54” (*speaker configured to reproduce said generated audio output*). EX1004, ¶[0017-18]; EX1012, ¶¶138-139.

- e. [1D] wherein the wireless digital audio spread spectrum receiver is configured to use independent code division multiple access communication and to use the received unique user code to communicate with only said wireless digital audio spread spectrum transmitter for the duration of a wireless connection; and;

The ’196-Publication renders obvious this limitation. EX1012, ¶¶140-143.

The term “independent” should be construed to mean “performed independent of any central control.” *See* §II.C. The ’196-Publication teaches that “receiver 50”

uses “code division multiple access (CDMA) [which] may be used to provide each user independent operation.” EX1004, ¶[0016].

“Receiver 50” uses the “same unique code word that was transmitted by the audio transmitter 20 specific to a particular a user” such that “[o]ther code words from wireless digital audio systems 10 may appear as noise. This may also be true for other device transmitted signals operating in the wireless digital audio system 10 spectrum.” *Id.* Thus, “receiver 50” is *configured to use...the received unique user code to communicate with only said wireless digital audio spread spectrum transmitter for the duration of a wireless connection.* The one-to-one relationship between the ’196-Publication’s receiver and transmitter teaches a *receiver...configured to use independent code division multiple access communication* as it does not require any centralized control. EX1012, ¶¶141-142; EX1004, ¶[0016].

- f. [1E] wherein the wireless digital audio spread spectrum receiver is further configured to: demodulate a received modulated transmission, and

The ’196-Publication renders obvious this limitation. EX1012, ¶¶144-148.

The ’196-Publication teaches that the transmitter can modulate the transmission in at least two ways by using a “64-Ary modulator 42”—a non-DPSK modulation—and by using a “differential phase shift key (DPSK) transmitter 48 that modulates the digital signal to be transmitted.” EX1004, ¶[0014]. Accordingly, the

'196-Publication teaches that the receiver can demodulate the DPSK modulation and 64-Ary (non-DPSK) modulation: “[t]he resultant processed digital signal may thereby be condition to represent the original signal processed and transmitted by the audio transmitter.” *Id.*, ¶[0017].

While the '196-Publication does not expressly recite the use of a DPSK demodulator in the audio receiver, the '196-Publication teaches an audio receiver which receives and processes the transmitted signal through a wideband band pass filter 54, direct conversion receiver 56, and a receiver summing element 58. *Id.*, ¶¶[0015]-[0017]. The '196-Publication then explains that “[t]he resulting summed digital signal from receiving summary element 58 may be processed by a 64-Ary demodulator 62 to demodulate the signal elements modulated in the audio transmitter.” *Id.*, ¶[0017]. The '196-Publication further teaches that the receiver can process the received transmission “to represent the original signal processed and transmitted by the audio transmitter.” *Id.* A POSA would have understood that to restore “the original signal,” the modulations performed prior to transmission (64-Ary and DPSK) by the transmitter must be demodulated by the audio receiver. EX1012, ¶¶145-147. A POSA would have further understood that the DPSK demodulation would have been performed prior to the 64-Ary demodulation (i.e., by wideband band pass filter 54, direct conversion receiver 56, and/or a receiver summing element 58). EX1012, ¶¶145-148. Thus, the '196-Publication renders

obvious *wherein the wireless digital audio spread spectrum receiver is further configured to demodulate a received modulated transmission.* EX1012, ¶¶146-148.

- g. [1F] generate a demodulated signal based on the received modulated transmission by performing at least one of a plurality of demodulations, wherein the plurality of demodulations includes a differential phase shift keying (DPSK) demodulation and also includes a non-DPSK demodulation.

The '196-Publication renders obvious this limitation. EX1012, ¶¶149-151.

As explained in limitation [1E], the '196-Publication teaches that the receiver can demodulate the DPSK modulation and 64-Ary (non-DPSK) modulation to restore “the original signal.” *See also* EX1004, ¶[0017] (“The resultant processed digital signal may thereby be condition to represent the original signal processed and transmitted by the audio transmitter.”)

Accordingly, the '196-Publication teaches that the receiver is configured *generating a demodulated signal based on the received modulated transmission by performing at least one of a plurality of demodulations, wherein the plurality of demodulations includes a differential phase shift keying (DPSK) demodulation (using wideband band pass filter 54, direct conversion receiver 56 and/or a receiver summing element 58) and also includes a non-DPSK demodulation (using “64-Ary demodulator 62”).* EX1012, ¶¶149-150

2. *Claim 2. The wireless digital audio spread spectrum receiver of claim 1, wherein said audio from said portable*

*audio source is music.*

The '196-Publication renders obvious this limitation. EX1012, ¶¶152-154.

The '196-Publication describes a “connection system for existing audio player devices,” “such as radio, tape players, [and] CD players.” EX1004, ¶¶[0002]-[0004]. “[C]assette tape players...may be used during exercising.” *Id.* A POSA would have understood that radio, tape players, and CD players provide audio signal representations that represent music. EX1012, ¶153-154.

### 3. *Claims 3*

Claim 3 largely corresponds to Claims 1 and 2 and Petitioner relies upon the arguments provided in Ground 1 above for the limitations as indicated below.

| Limitation | Corresponding Limitation |
|------------|--------------------------|
| [3P]       | [1P]                     |
| [3A]       | [1A]                     |
| [3C]       | [1B]                     |
| [3D]       | [1C]                     |
| [3E]       | [1D]                     |
| [3F]       | [1E], [1F]               |

- a. [3B] a decoder operative to decode the demodulated transmission and to generate a receiver audio signal representation, the decoder configured to decode reduced intersymbol interference coding and to decode representations of audio in the frequency range of 20 Hz

to 20 kHz;

The '196-Publication renders obvious this limitation. EX1012, ¶¶156-159.

Audio transmitter is connected to an audio source 80 that “provides an analog output signal in the approximate range of 20 Hz to 20 kHz.” *See* §III.D.1.a. Audio transmitter includes “encoder 36...to reduce intersymbol interference (ISI) by using a transform code to encode the digital signal” (*coding that reduces intersymbol (inter-symbol) interference*). EX1004, ¶[0013].

Audio receiver 50 comprises “source decoder 68” to “decode the coding applied by the encoder 36” and thus processes the received signal for reduction of ISI. *Id.*, ¶[0017]. Following source decoder 68, “[t]he resultant processed digital signal may thereby be condition[ed] to represent the original signal processed and transmitted by the audio transmitter 20” which is in the frequency range of 20 Hz to 20 kHz. *Id.*; *see also id.*, ¶[0018] (the receiver includes “[a]n analog low pass filter 72 may be used to filter the analog audio signal to pass a signal in the approximate 20 Hz to 20 kHz frequency range and filter other frequencies.”). Thus, the '196-Publication teaches *a decoder (source decoder 68) operative to decode the demodulated transmission and to generate a receiver audio signal representation, the decoder configured to decode reduced intersymbol interference coding and to decode representations of audio in the frequency range of 20 Hz to 20 kHz*. EX1012, ¶¶158-159; EX1004, ¶¶[0013], [0017]-[0018].

- b. [3G] wherein said decoding is separate from said plurality of demodulations.

The '196-Publication renders obvious this limitation. EX1012, ¶¶160-163.

The '196-Publication discloses separate components for demodulation and for decoding the received signal—64-Ary demodulation occurs in demodulator 62, and DPSK demodulation is performed using wideband band pass filter 54, direct conversion receiver 56, and/or a receiver summing element 58 (*see* limitations [1E]-[1F]), while source decoder 68 “may further decode the coding applied by the encoder 36.” EX1004, ¶[0018], Fig. 3; EX1012, ¶161.

- 4. *Claim 4. The portable spread spectrum receiver of claim 3, wherein the audio signal representation represents music.*

*See claim 2.*

- 5. *Claim 5*

- a. [5P] A wireless digital coded audio spread spectrum transmitter operatively coupled to a portable audio player and configured to transmit a unique user code and a representation of an audio signal with a frequency range of 20 Hz to 20 Khz, wherein said digital coded audio spread spectrum transmitter is configured to wirelessly communicate with a digital audio spread spectrum receiver and is configured to be moved in any direction during operation, said wireless digital coded audio spread spectrum transmitter comprising:

The '196-Publication renders obvious this limitation. EX1012, ¶¶167-174.

As explained in [1P], the '196-Publication renders obvious a *wireless digital audio spread spectrum receiver...configured to receive a unique user code and a*

*high quality audio signal representation with a frequency range of 20 Hz to 20 kHz from a digital audio spread spectrum transmitter.* §III.D.1.a.

As reflected with corresponding annotations (red, green, blue) above and below, [5P] recites materially the same limitations, and thus, the '196-Publication renders obvious *a wireless digital coded audio spread spectrum transmitter...configured to transmit a unique user code and a representation of an audio signal with a frequency range of 20 Hz to 20 Khz, wherein said digital coded audio spread spectrum transmitter is configured to wirelessly communicate with a digital audio spread spectrum receiver* for the reasons cited in [1P]. See §III.D.1.a.

The '196-Publication discloses that an “audio transmitter 20 may be connected to the audio source 80 headphone jack 82 using a headphone plug 22.” *Id.*, ¶[0011], FIG. 1. The '196-Publication further discloses “portable player systems such as cassette tape players... having a headphone jack to which a headphone is connected by wire and connector.” *Id.*, ¶[0002]; *see also id.*, ¶¶[0002] (“audio player devices such as radio, tape players, CD players.”), [0003]-[0004]; EX1012, ¶170. The '196-Publication states “audio transmitter 20 may be a compact device that may be connected to the audio source 80 to remain therewith for transmitting a signal to an audio receiver” (EX1004, ¶[0012]) and thus teaches *transmitter* (“audio transmitter 20”) *operatively coupled to a portable audio player* (“audio player or audio source 80”). EX1012, ¶¶171-172.

The '196-Publication teaches that the “compact” transmitter is intended to be used with “portable player systems...that may be used during...running,” and thus teaches a transmitter *configured to be moved in any direction during operation.*”

EX1004, ¶¶[0001]-[0002]; EX1012, ¶¶171-174.

- b. [5A] an encoder operative to encode a first representation of an audio signal to reduce intersymbol interference associated with a transmitted representation of the audio signal, said encoder configured to process signals in the frequency range of 20 Hz to 20 kHz for representation in said first representation of an audio signal;

The '196-Publication renders obvious this limitation. EX1012, ¶¶175-178.

The audio transmitter receives “an audio signal from audio source 80” and “audio source 80 normally provides an *analog output signal in the approximate range of 20 Hz to 20 kHz.*” EX1004, ¶[0012]. The '196-Publication teaches that the audio transmitter includes “encoder 36...to reduce intersymbol interference (ISI) by using a transform code to encode the digital signal” (*coding that reduces intersymbol (inter-symbol) interference*) and thus teaches *an encoder operative to encode a first representation of an audio signal to reduce intersymbol interference associated with a transmitted representation of the audio signal.* EX1004, ¶[0013].

- c. [5B] wherein the wireless digital coded audio spread spectrum transmitter is further configured to perform at least one of a plurality of modulations on the first representation of the audio signal and generate a modulated signal based on the performance of the plurality of modulations, wherein the plurality of modulations includes a differential phase shift keying

(DPSK) modulation and a non-DPSK modulation;

The '196-Publication renders obvious this limitation. EX1012, ¶¶179-180.

The '196-Publication teaches that the transmitter can modulate the transmission to *generate a modulated signal* in at least two ways by using a “64-Ary modulator 42”—a non-DPSK modulation—and by using a “differential phase shift key (DPSK) transmitter 48 that modulates the digital signal to be transmitted.” EX1004, ¶[0014].

- d. [5C] wherein said plurality of modulations are separate from the encoding and processing by the encoder; and

The '196-Publication renders obvious this limitation. EX1012, ¶¶181-184.

The '196-Publication discloses separate components for modulation and encoding the audio signal. Specifically, “encoder 36 may be used to reduce intersymbol interference (ISI) by using a transform code to encode the digital signal.” EX1004, ¶[0013], Fig. 2. Following encoding, modulators 42 and 48 separately process the signal:

**A 64-Ary modulator 42** may be used for summation at summation element 46 with a transmitter code generator 44 signal to produce a high symbol rate, and a unique codeword that spreads the signal spectrum. The output of the summation element 46 may then be communicated to **a differential phase shift key (DPSK) transmitter 48 that modulates the digital signal** to be transmitted by an omni-directional transmitting antenna 24 at approximately

*Id.*, ¶[0014].

- e. [5D] wherein the wireless digital coded audio spread spectrum transmitter is further configured to use the modulated signal and to use independent code division multiple access communication to wirelessly transmit a transmitted representation of the audio signal, and wherein the transmitted unique user code distinguishes the transmitted representation of the audio signal from other transmitted audio signals in the spread spectrum transmitter spectrum, said other transmitted audio signals not originating from said wireless digital coded audio spread spectrum transmitter.

The '196-Publication renders obvious this limitation. EX1012, ¶¶185-189.

The '196-Publication's transmitter includes "a transmitter code generator 44 signal to produce a high symbol rate, and a unique codeword that spreads the signal spectrum" and a "differential phase shift key (DPSK) transmitter 48 that modulates the digital signal to be transmitted by an omni-directional transmitting antenna 24." *Id.*, ¶[0014].

The receiver includes "receiver code generator 60 [that] may contain the same unique code word that was transmitted by the audio transmitter 20 specific to a particular a user." *Id.*, ¶[0016]. The '196-Publication states "[t]his code division multiple access (CDMA) may be used to provide each user independent operation." *Id.* Thus, the '196-Publication teaches the *transmitted unique user code distinguishes the transmitted representation of the audio signal from other transmitted audio*

*signals in the spread spectrum transmitter spectrum, said other transmitted audio signals not originating from said wireless digital coded audio spread spectrum transmitter.* EX1012, ¶¶186-188.

The term “independent” should be construed to mean “performed independent of any central control.” *See* §II.C. The one-to-one relationship between the ’196-Publication’s receiver and transmitter teaches *independent code division multiple access communication* as it does not require any centralized control. EX1012, ¶189.

6. *Claim 6. The wireless digital coded audio spread spectrum transmitter of claim 5, wherein the first representation of an audio signal is representative of music.*

The ’196-Publication renders obvious this limitation. EX1012, ¶¶190-192.

The ’196-Publication describes a “connection system for existing audio player devices,” “such as radio, tape players, [and] CD players.” EX1004, ¶¶[0002]-[0004]. “[C]assette tape players ... may be used during exercising.” *Id.* A POSA would have understood that radio, tape players, and CD players provide a *representation of an audio signal that is representative of music.* EX1012, ¶¶191-192.

7. *Claim 7. The wireless digital audio spread spectrum receiver of claim 1, wherein said non-DPSK demodulation is 64-ary demodulation.*

The ’196-Publication renders obvious this claim. EX1012, ¶¶193-195.

The ’196-Publication discloses that the receiver may comprise “a 64-Ary demodulator 62 to demodulate the signal elements modulated in the audio

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transmitter 20.” EX1004, ¶[0017].

8. *Claim 8. The portable spread spectrum receiver of claim 3, wherein said non-DPSK demodulation is 64-ary demodulation.*

See claim 7.

9. *Claim 9. The wireless digital coded audio spread spectrum transmitter of claim 5, wherein said non-DPSK modulation is 64-ary modulation.*

The '196-Publication renders obvious this claim. EX1012, ¶¶198-200.

The '196-Publication discloses that the transmitter may comprise a “64-Ary modulator 42 may be used for summation at summation element 46 with a transmitter code generator 44 signal to produce a high symbol rate, and a unique codeword that spreads the signal spectrum.” EX1004, ¶[0014].

10. *Claim 10. The wireless digital audio spread spectrum receiver of claim 1, wherein the digital audio spread spectrum receiver is further configured to receive the receive wireless spread spectrum signal transmissions where the receive wireless spread spectrum signal transmissions are in the Industrial Scientific and Medical 2.4 GHz band, ranging from 2.4 GHz to 2.5 GHz.*

The '196-Publication renders obvious this limitation. EX1012, ¶¶201-204.

The '196-Publication teaches that “[t]he audio system 10 may digitize the audio signal and may transmit an electromagnetic signal at 2.4 GHz using approximately 100 milliwatts or less of power.” EX1004, ¶[0011]; *see also id.*, ¶[0014]. The transmitted signal is received by the receiving antenna 52 and the “received spread spectrum signal may then be communicated to a 2.4 GHz direct

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conversion receiver 56.” *Id.*, ¶[0015].

11. *Claim 11. The wireless digital audio spread spectrum receiver of claim 3, wherein the digital audio spread spectrum receiver is further configured to receive the receive wireless spread spectrum signal transmissions where the receive wireless spread spectrum signal transmissions are in the Industrial Scientific and Medical 2.4 GHz band, ranging from 2.4 GHz to 2.5 GHz.*

See claim 10.

12. *Claim 12. The wireless digital coded audio spread spectrum transmitter of claim 5, wherein wireless digital coded audio spread spectrum transmitter is further configured to transmit the transmitted representation of the audio signal where the transmitted representation of the audio signal are in the Industrial Scientific and Medical 2.4 GHz band, ranging from 2.4 GHz to 2.5 GHz.*

The '196-Publication renders obvious this limitation. EX1012, ¶¶207-208.

The '196-Publication teaches that “[t]he audio system 10 may digitize the audio signal and may transmit an electromagnetic signal at 2.4 GHz using approximately 100 milliwatts or less of power.” EX1004, ¶[0011]; *see also id.*, ¶[0014]. The transmitted signal is received by the receiving antenna 52 and the “received spread spectrum signal may then be communicated to a 2.4 GHz direct conversion receiver 56.” *Id.*, ¶[0015].

#### **E. Ground 2: Walley In View of Miyake, Gibson and Rappaport Renders Obvious Claims 1-12.**

1. *Overview of the combination; motivation to combine; expectation of success.*

Ground 2 relies on Walley in view of Miyake, Gibson and Rappaport.

In a parallel proceeding, PO proposed that the terms “transmitter” and “audio source” should have their plain and ordinary meaning, and Petitioner disagrees with those proposed constructions. EX1023, 4-9. However, for purposes of Ground 2 herein, Petitioner adopts PO’s constructions for these terms to illustrate that, even under PO’s proposed constructions, the challenged claims are obvious in view of the cited prior art. In Ground 3, Petitioner applies the proper constructions for these terms, as set forth in Section II.C.

Walley is directed to “generic type spread spectrum controllers” which address “Problems With the Current Art” relating to the “different requirements” of “wireless communications electronics, such as cordless and cellular telephones, [and] wireless units to transmit music to speakers or headphones.” EX1015, Abstract, 2:33-39, 2:66-3:1, 12:15-25. Walley teaches a variable length PN code controller which can increase the PN code to “increase the transmit range or to overcome interference or jamming.” EX1012, ¶211 (citing EX1015, 8:39-43, 9:4-9)). Walley does not expressly disclose the claimed “*unique user code*.” However, Miyake teaches a “spread spectrum communication system which can simplify the management of users and services” by assigning user-specific spreading codes. EX1016, 2:23-26, 5:49-56, 8:12-60; EX1012, ¶212.

A POSA would have been motivated to combine the spreading process of Walley with Miyake’s spreading process because it would combine Walley’s

adjustable system PN code (which can be lengthened to reduce interference) with Miyake's user-specific spreading code, to provide a spreading process which creates user-specific spreading codes that can be lengthened to reduce interference. EX1012, ¶¶211-213. "[I]f 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." *KSR Int'l Co. v. Teleflex Inc.*, 550 U.S. 398, 417 (2007). Such a combination would involve the use of Miyake's known spreading process to improve Walley's similar spread spectrum system to provide user-specific spreading codes to tailor transmissions based on user preferences. EX1012, ¶214. For example, Walley explains that "the clarity and fidelity of sound in a portable phone may be an important consideration but, as the signal starts to fade, a user may willingly accept a somewhat lower fidelity in order to have an increased range." EX1015, 3:22-26. A POSA would have understood that user-specific spreading codes would allow the system to identify users that are willing to accept a lower fidelity in exchange for an increased range (or vice versa). EX1012, ¶214. Moreover, it would have been a simple substitution of one known element (Walley's system-based spreading code) for another (Miyake's user-specific spreading code) to obtain predictable results (a user-specific spreading code). EX1012, ¶¶211-214. A POSA would have reasonably expected to succeed in using Miyake's user-specific spreading code in Walley's system because Miyake

describes using such spreading codes in the context of a spread spectrum system like Walley's and a POSA would have understood that implementing spreading codes on a user-basis (Miyake) instead of on a system-basis (Walley) would have only required routine knowledge as user accounts and user-specific systems were well-known, and Miyake describes its spread spectrum system as something "which can be designed easily." EX1012, ¶¶211-215; EX1016, 2:23-26.

Although Walley describes a CDMA spread spectrum controller suitable for a range of devices, Walley does not expressly disclose certain implementation details for the receiver and transmitter, including how its audio signal is encoded or modulated prior to transmission, how the received signal is decoded or demodulated, and whether a received signal is directly converted from a carrier frequency to baseband without the use of an intermediate frequency. EX1012, ¶¶216-217. Rappaport is a textbook whose purpose "to initiate the newcomer to cellular radio and wireless personal communications." EX1018, xiii. Similarly, Gibson is a communications handbook which includes "articles or chapters" that are "written as tutorials or overviews, so that once the reader locates the broader topic, it is easy to find an answer to a specific question." EX1022, iii, title. A POSA would have been motivated to use the teachings of the Rappaport textbook and Gibson handbook to provide the implementation details required to create a transmitter and receiver based on Walley's teachings and would have had a reasonable expectation that

applying Rappaport's and Gibson's teachings to Walley would be successful. EX1012, ¶¶216-218. A POSA would have reasonably expected to succeed in implementing Gibson's and Rappaport's teachings in Walley's system because Gibson is a handbook which includes "articles or chapters" that are "written as tutorials or overviews, so that once the reader locates the broader topic, it is easy to find an answer to a specific question" (EX1022, iii) and Rappaport was "designed for the student or practicing engineer" (EX1018, xiii) and "provides extensive coverage of the most common analog and digital modulation techniques used in mobile communications" (EX1018, xiv).

2. *Claim 1*

a. [1P]

Assuming claim 1's preamble is limiting, Walley in view of Miyake, Gibson and Rappaport renders obvious this limitation. EX1012, ¶¶220-226.

Walley teaches "generic type spread spectrum controllers which can be used in a variety of applications." EX1015, Abstract. These controllers address "Problems With the Current Art" relating to the "different requirements" of "wireless communications electronics, such as cordless and cellular telephones, [and] wireless units to transmit music to speakers or headphones." EX1015, 2:33-39, 2:66-3:1, 12:15-25. Thus, Walley teaches a *wireless digital audio spread spectrum receiver, capable of mobile operation* (phone, speakers or headphones).

Walley discloses a “representative example of a portable telephone,” which includes “mobile hand unit” and “a base unit.” *Id.*, 6:48-66. The “base unit” can “broadcast a high fidelity music signal to the hand unit” when a person “was placed on hold.” *Id.*, 7:36-40. Thus, Walley teaches a *digital audio spread spectrum transmitter* (“wireless unit” or “base unit”) and teaches a *receiver operative to communicate wirelessly with said...transmitter* (“hand unit”, “speaker” or “headphones” which receives music from a “wireless unit[]” or “base unit”).

Walley teaches a system for transmitting audio having a frequency range of 20 Hz to 20 kHz:

The type of operations that the data input controller can perform are dependent on the data which is input. ... if the chipping rate of the transmit signal were adequate to **support a sampling rate which would yield a 20 Hz to 20 kHz audio bandwidth**, then the transmit controller 805 might instruct the data input controller to sample at a rate of X samples per second that would yield **a 20 Hz to 20 kHz audio bandwidth**.

EX1015, 8:67-9:35; 2:33-39, 7:36-40, 12:15-24, 2:67-3:25.

Thus, Walley teaches *high quality audio signal representation with a frequency range of 20 Hz to 20 kHz*.

A POSA would have understood that transmitting music to speakers, headphones, or a portable phone’s “hand unit” would require the *transmitter* (“base

unit” or a “wireless unit[.]”) to include or be connected to (and thus would be *coupled to*) an audio source to provide music input signal. EX1012, ¶¶223-226 (citing EX1015, 6:52-56 (“instead of a continuous speech input...any manner of data could be substituted and the method described would be equally viable.”), 11:49-51 (“The fidelity of the audio signal will decrease as the sampling rate of the input signal decreases.”).) Thus, Walley teaches *said audio signal representation representative of audio from a portable audio source*.

As explained in Section II.C above, the term “unique user code” should be construed to mean a “fixed code (bit sequence) specifically associated with one user of a device(s).” Walley discloses a spread spectrum system that uses a “spreading code[.]” (“commonly referred to as Pseudo Noise (PN) codes”) which Walley discloses as a “a dedicated code that is used to separate that system’s transmissions from all others.” EX1015, 1:27-59. “In a CDMA transmission, each bit of data to be transmitted is replaced by a spreading code if the data to be transmitted is a ‘1’, and is replaced by the inverse of the spreading code if the data to be transmitted is ‘0’.” EX1015, 1:38:41. Walley teaches that this code can be lengthened to “increase the noise immunity and the transmission range of the signal.” *Id.*, 4:23-25.

Although Walley discloses that its “spreading codes” are “dedicated code[s]” used to separate transmissions, it does not expressly disclose that the “spreading codes” are unique to a particular user. Yet, Miyake discloses “spreading codes

specific to individual users,” which is consistent with the ’627 patent’s explanation that a “unique user code is specifically associated with one wireless digital audio system user.” EX1001, 2:60-66. Specifically, Miyake teaches a “spread spectrum communication system which can simplify the management of users and services.” EX1016, 2:23-26. Miyake describes a “spreading code” based on the output of a “first spreading code generator 32, which produces spreading codes specific to individual users” and the “output from the second spreading code generator 33, which produces spreading codes assigned according to the attributes.” EX1016, 5:49-56; *see also id.*, 8:12-60.

A POSA would have understood this “spreading code” is a *unique user code* because Miyake discloses that the “spreading codes [are] specific to individual users.” *Id.*, 5:49-56. Further, Miyake discloses that the spreading code is “set on the transmitter side [and] should coincide with the spreading code set on the receiver side” (and thus, is a “fixed code”) and “those spreading codes should differ from those for the other channel users who also use this communication system..” *Id.*, 7:12-21.

A POSA would have been motivated to combine the spreading process of Walley with Miyake’s spreading process because it would combine Walley’s dedicated, system PN code with Miyake’s spreading code to provide a spreading process which creates user-specific spreading codes would allow the system to

identify users that are willing to accept a lower fidelity in exchange for an increased range (or vice versa) and can be lengthened to reduce interference. §III.E.1; EX1012, ¶¶228-235.

Walley in view of Miyake, Gibson and Rappaport thus render obvious a *wireless digital audio spread spectrum receiver, capable of mobile operation, (Walley's phone, speaker or headphones) configured to receive a unique user code (Walley's spreading code combined with Miyake's user-specific code) and a high quality audio signal representation with a frequency range of 20 Hz to 20 kHz (Walley's 20 Hz to 20 kHz audio and high-fidelity music) from a digital audio spread spectrum transmitter (Walley's music-transmitting wireless unit or base unit), said audio signal representation representative of audio from a portable audio source (Walley's audio source), said digital audio spread spectrum receiver operative to communicate wirelessly with said digital audio spread spectrum transmitter.*

b. [1A]

Walley in view of Miyake, Gibson and Rappaport renders obvious this limitation. EX1012, ¶¶240-247.

Walley discloses *a wireless digital audio spread spectrum receiver (headphones, speakers or phone) capable of processing the high quality audio signal having a frequency range of 20 Hz to 20kHz. See [1P].*

As explained in Section II.C above, the term “direct conversion module” should be construed to mean a “module for converting radio frequency to baseband or very near baseband in a single frequency conversion without an intermediate frequency.” Walley’s exemplary spread spectrum transmitter includes a “modulator 213, for modulating the carrier frequency 215” which respect to FIG. 2, depicted below:

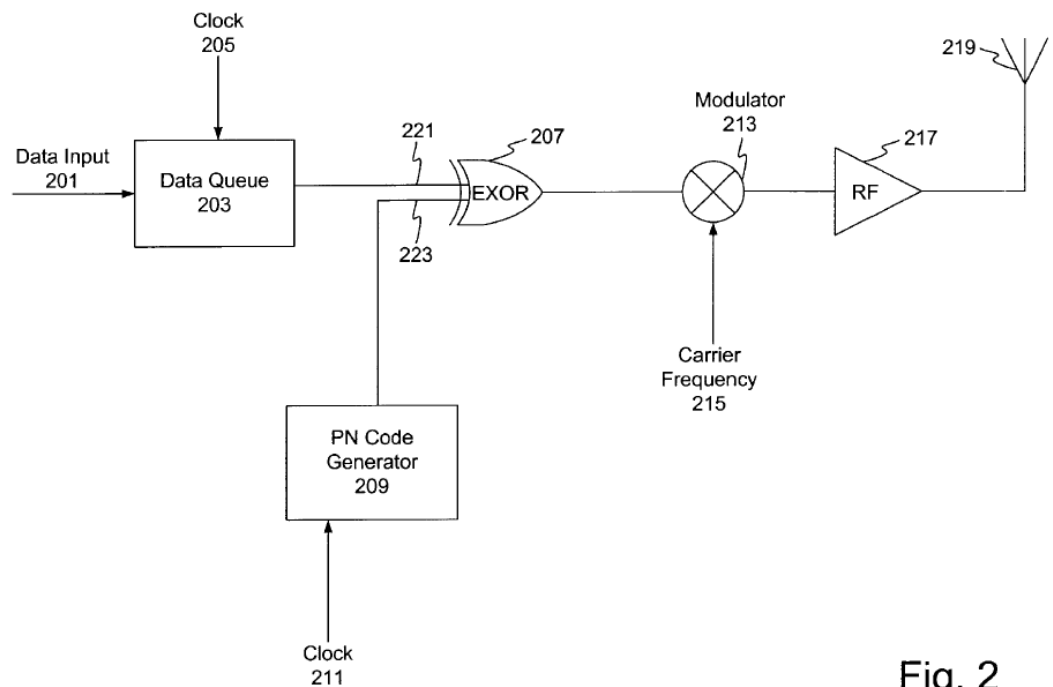


Fig. 2

EX1015, FIG. 2.

Walley does not explicitly disclose whether the receiver converts the received signal to baseband; however, a POSA would have understood that the disclosure of a transmitter which modulates a signal with a carrier frequency would teach or suggest a receiver which receives this transmission and performs the reciprocal steps. EX1012, ¶¶242-245.

Walley also does not explicitly disclose whether its receivers directly convert the received signal to baseband without using an intermediate frequency. EX1012, ¶246. However, Gibson teaches a “single conversion receiver”/“direct conversion receiver” which converts a received signal to baseband with “zero IF” (i.e., without using an intermediate frequency). EX1022, 1323, FIG. 92.13; EX1012, ¶246.

It would have been obvious to combine Gibson’s direct conversion receiver with the teachings of Walley to provide a receiver including a *direct conversion module configured to receive wireless spread spectrum signal transmissions* in view of Walley’s teaching of a “modulator 213, for modulating the carrier frequency 215,” in the transmitter. Gibson explains a “direct conversion receiver” is suitable for the “low power consumption and low cost” needs of portable electronic devices (e.g., “telephones”) (EX1022, 1322-23) and “possesses several advantages over the normal superheterodyne approach” (*id.*, 1323-24) which a POSA would understand uses an intermediate frequency (EX1012, ¶¶246-247). A POSA would have understood that a receiver, such as wireless headphones, would benefit from a component suitable for “low power consumption and low cost” designs. EX1012, ¶¶246-247. A POSA would have understood that the use of Gibson’s direct conversion receiver as part of the demodulator suggested by Walley is a simple substitution of one known frequency conversion/demodulation technique for another to achieve the predictable result of a conversion from a carrier frequency to baseband

without the use of an intermediate frequency. EX1012, ¶¶246-247. Additionally, a POSA would have understood that the inclusion of Gibson's direct conversion receiver in Walley's receiver is the combination of prior art elements according to known methods to yield predictable results. EX1012, ¶¶246-247.

Walley in view of Miyake renders obvious a *unique user code* (Walley's spreading code combined with Miyake's user-specific code) for spread spectrum communication. Walley teaches that "each bit of data to be transmitted is replaced by a spreading code if the data to be transmitted is a '1', and is replaced by the inverse of the spreading code if the data to be transmitted is '0'." EX1015, 1:38:41. Thus, Walley in view of Miyake renders obvious *wireless spread spectrum signal transmissions representative of the unique user code*.

Walley describes a system in which an audio signal (such as "continuous speech" or "any manner of data") is "digitized and compressed," and then "provided to transmit data queue 407, where it is maintained prior to transmission." EX1015, 6:51-7:26; *see also id.* at 12:15-24, 1:27-59, FIG. 4. Walley, however, does not expressly disclose how the audio signal is "encoded" prior to transmission. Gibson teaches that a signal can be encoded by introducing a "controlled amount of intersymbol" interference "at the transmitter, which can be removed at the receiver" using "partial-response (PR) signaling" (EX1022, 329) and then "precod[ing]" the signal "in such a way as to compensate for...intersymbol interference." (i.e. *coding*

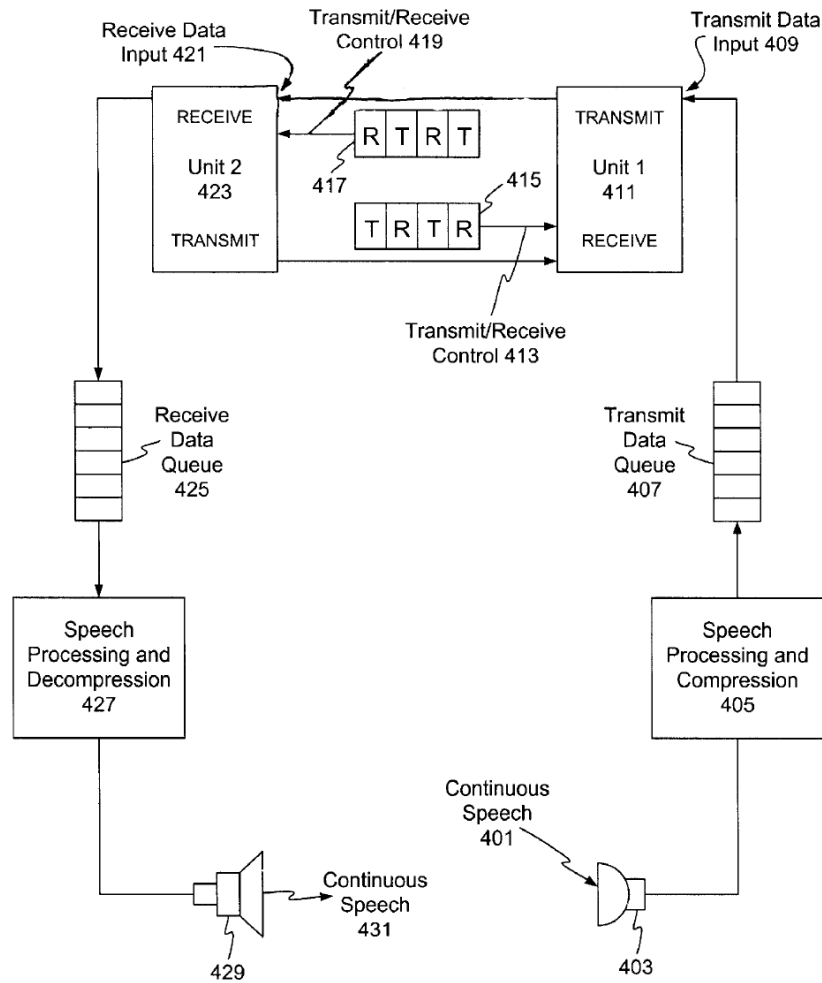
*that reduces intersymbol (inter-symbol) interference*). (EX1022, 333).

A POSA would have been motivated to combine Gibson with Walley to compensate for intersymbol interference in digital communication systems by encoding/decoding a digitized audio signal using Gibson's precoding techniques to provide a transmitter which creates *wireless spread spectrum signal transmissions* that have been *encoded to reduce intersymbol interference*. A POSA would have understood that the addition of Gibson's precoding techniques to Walley's system is the use of a known technique (precoding) to improve a similar digital data communication system in the same way (to reduce intersymbol interference). EX1012, ¶¶251-252.

c. [1B]

Walley in view of Miyake, Gibson and Rappaport renders obvious this limitation. EX1012, ¶¶254-256.

Walley describes a system with a speech processing and compression block 405 (which "digitizes" an audio signal before transmission) and a corresponding speech processing and decompression block 427 to reverse that process to provide an audio signal to speaker 429:



EX1015, FIG. 4.

**The Microphone 403 is coupled to a speech processing and compression block 405 where the continuous speech is digitized and compressed ....the data is provided from the receive data queue 425 to the speech processing and decompression module 427 for processing and decompression. The decompressed, processed speech is then provided to an output device, such as the speaker 429, for reproducing it as continuous speech 431.**

A POSA would have understood that a system which converts an input from analog-to-digital before transmission would teach or suggest a digital-to-analog converter to convert the received digital audio signal back to analog form for output through a speaker. EX1012, ¶¶255, 256.

d. [1C]

Walley in view of Miyake, Gibson and Rappaport renders obvious this limitation. EX1012, ¶¶257-260.

Walley discloses a receiver (portable phone, headphones, or a speaker) which includes *a speaker configured to reproduce said generated audio output*. EX1015, 6:57-7:26 (“The decompressed, processed speech is then provided to an output device, such as the speaker 429”); *see also id.*, 6:51-56, 12:15-24 (“Another embodiment...comprises a set of wireless speakers”).

Walley’s receiver uses a transmitter’s unique spreading code (“a dedicated code”) “to separate that system’s transmission from all others.” EX1015, 1:27-40; *see also id.*, 1:41-59, 5:33-44.

A POSA would have understood that a speaker which uses a transmitter’s unique spreading code to receive the transmitter’s audio transmission would generate audio which does not include audible audio content from other transmitters. EX1012, ¶¶259-260.

e. [1D]

Walley in view of Miyake, Gibson and Rappaport renders obvious this limitation. EX1012, ¶¶261-269.

The term “independent” should be construed to mean “performed independent of any central control.” *See* §II.C.

Walley discloses a receiver which uses a transmitter’s unique spreading code (“a dedicated code”) “to separate that system’s transmission from all others.” EX1015, 1:27-40; *see also id.*, 1:41-59, 5:33-44.

Walley does not teach whether a receiver uses *said unique...code to communicate with only said spread spectrum transmitter.*

Miyake teaches a *receiver is configured to use independent code division multiple access communication* as Miyake teaches that “the spreading code set on the transmitter side should coincide with the spreading code set on the receiver side” and “those spreading codes should differ from those for the other channel users who also use this communication system.” EX1016, 6:63-7:18. The one-to-one relationship between Miyake’s receiver and transmitter teaches this definition as it does not require any centralized control. EX1012, ¶268. Additionally, Walley teaches that an orthogonal code is used to separate the transmissions of interest from the rest, so that the receiver only communicates with the transmitter of interest. EX1012, ¶268. Thus, Miyake alone and in view of Walley teach a

*receiver...configured to use independent code division multiple access communication.*

A POSA would have been motivated to combine the spreading process of Walley with Miyake to provide a spreading process which creates user-specific spreading codes whose code lengths are adjusted to reduce noise/interference in order to allow each user's respective receiver to operate independent of the operation of another user's receiver for the duration of a wireless connection. *See* §III.E.1.

f. [1E]

Walley in view of Miyake, Gibson and Rappaport renders obvious this limitation. EX1012, ¶¶270-275.

Walley discloses modulating a signal for transmission and then demodulate the signal by a receiver using “CDMA”:

Spread spectrum, also known as **CDMA**, is a **method of signal modulation** which distributes the data contained in a signal over a wide bandwidth.

EX1015, 5:13-15; *see also id.*, 5:16-44, FIG. 2, 6:10-26 (describing CDMA modulation in FIG. 2), 1:41-51 (despreading); EX1012, ¶271.

Walley's spread spectrum transmitter also includes a “modulator 213, for modulating the carrier frequency 215.” EX1015, 6:10-34.

Walley does not expressly disclose what modulation is performed by modulator 213. A POSA would have understood that this modulator could include,

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for example a DPSK modulator or an M-ary Quadrature Amplitude Modulation (QAM). For example, Rappaport explains that Differential PSK (DPSK) is a “widely used” modulation technique which advantageously “avoids the need for a coherent reference signal at the receiver” and whose receivers are “easy and cheap to build.” EX1018, 242.

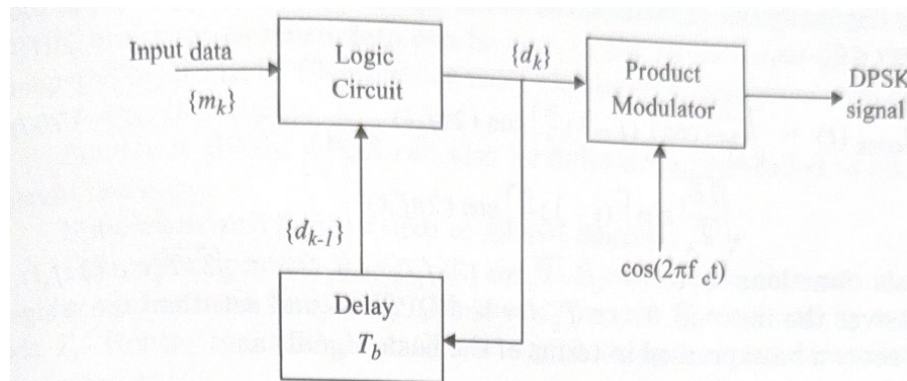


Figure 5.24  
Block diagram of a DPSK transmitter.

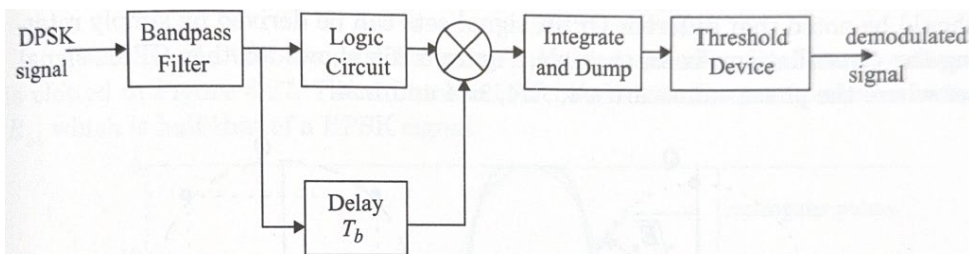


Figure 5.25  
Block diagram of DPSK receiver.

EX1018, FIG. 5.24, 5.25.

Rappaport additionally discloses M-ary QAM, which is a modulation that has “superior” “power efficiency” over M-ary PSK. EX1018, 270-72.

A POSA would have understood that the use of Rappaport’s DPSK and M-ary QAM modulators/demodulators to perform the modulation/demodulation in

Walley's system is the use of a known technique (DPSK and/or 64-ary QAM) to improve a similar wireless system in the same way (to modulate/demodulate a signal). EX1012, ¶¶273-275.

g. [1F]

Walley in view of Miyake, Gibson and Rappaport renders obvious this limitation. EX1012, ¶¶276-281.

As explained in [1E]:

- Walley teaches CDMA modulation/demodulation and a “modulator 213.”
- A POSA would have been motivated to use of Rappaport's DPSK and M-ary QAM modulators/demodulators to perform the modulation/demodulation in Walley's system corresponding to modulator 213.

A POSA would have understood that despread a spread spectrum transmission using CDMA to recover the original data would teach or suggest the use of a *demodulator* on the receiving end to demodulate the modulated signal. EX1012, ¶¶277-278.

Thus, Walley in view of Miyake, Gibson and Rappaport renders obvious *generate a demodulated signal based on the received modulated transmission by performing at least one of a plurality of demodulations, wherein the plurality of demodulations includes a differential phase shift keying (DPSK) demodulation*

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(Rappaport's DPSK) *and also includes a non-DPSK demodulation* (Rappaport's M-ary QAM or Walley's CDMA).

In the event PO asserts that [1F] requires a receiver capable of performing *more than one* type of demodulation, any such requirement would still have been obvious. A POSA would have appreciated that DPSK and non-DPSK modulation/demodulation methods each provided different benefits and challenges, and that no single method would always be best for all transmissions and environments. EX1012, ¶¶277-280. Walley's "generic type spread spectrum controllers which can be used in a variety of applications" (EX1015, Abstract) would thus benefit from being able to select between a DPSK and a non-DPSK modulation/demodulation to optimize quality/performance for a given wireless application. EX1012, ¶¶277-280.

3. *Claim 2.*

Walley in view of Miyake, Gibson and Rappaport renders obvious this claim. EX1012, ¶¶282-285.

Walley teaches "generic type spread spectrum controllers" for "cordless and cellular telephones, [and] wireless units to transmit **music** to speakers or headphones." EX1015, Abstract, 2:33-39, 12:15-25. Walley discloses a "representative example of a portable telephone," which includes "mobile hand unit" and "a base unit." *Id.*, 6:48-66. The "base unit" can "broadcast a high fidelity music

signal to the hand unit” when a person “was placed on hold.” *Id.*, 7:36-40.

A POSA would have understood that transmitting music to speakers, headphones, or a portable phone’s “hand unit” would require the music transmitter (“wireless units” or a “base unit”) to be coupled to a music audio source to provide music input signal. EX1012, ¶¶283-285 (citing EX1015, 6:52-56 (“instead of a continuous speech input...any manner of data could be substituted and the method described would be equally viable.”), 11:49-51 (“The fidelity of the audio signal will decrease as the sampling rate of the input signal decreases.”).)

#### 4. *Claim 3*

Claim 3 largely corresponds to Claim 1, and Petitioner relies upon the arguments provided in Ground 2 above for the limitations as indicated in the below table.

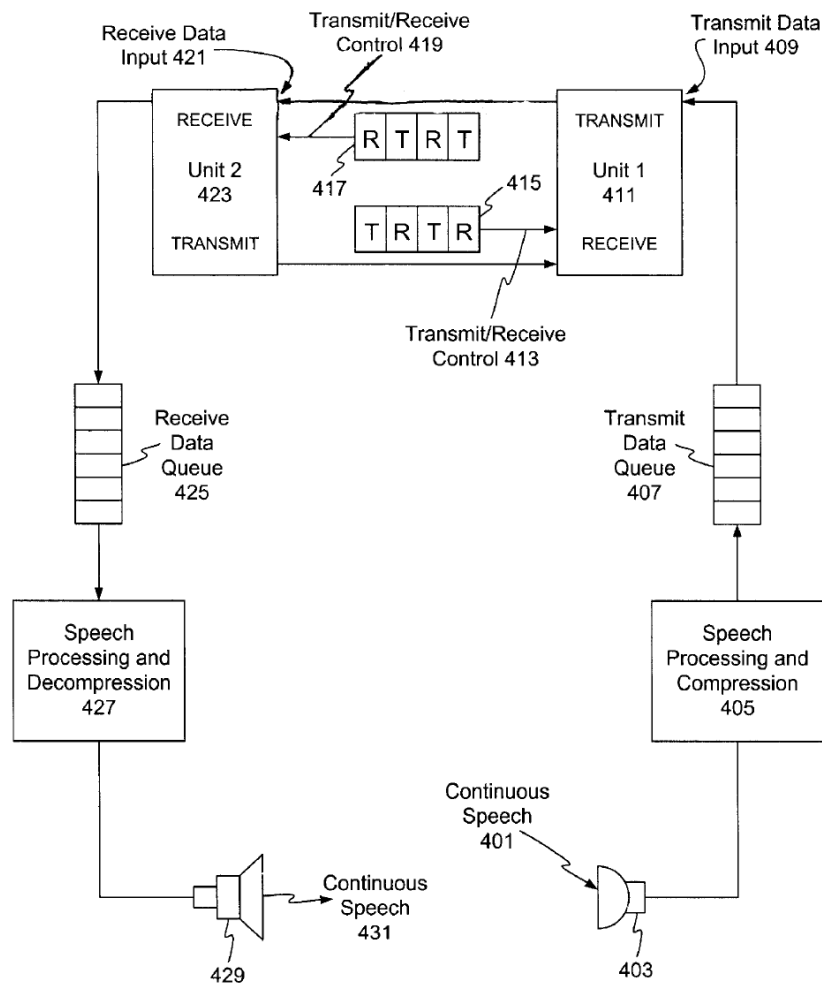
| Limitation | Corresponding Limitation |
|------------|--------------------------|
| [3P]       | [1P]                     |
| [3A]       | [1A]                     |
| [3C]       | [1B]                     |
| [3D]       | [1C]                     |
| [3E]       | [1D]                     |
| [3F]       | [1E], [1F]               |

##### a. [3B]

Walley in view of Miyake, Gibson and Rappaport renders obvious this

Walley teaches *representations of audio in the frequency range of 20 Hz to 20 kHz. See [1P] (§III.E.2.a).*

Walley describes a system which includes a speech processing and compression block 405 (which “digitizes” an audio signal before transmission) and a corresponding speech processing and decompression block 427 (*decoder operative to decode the demodulated transmission*) to process a received transmission to provide an audio signal to speaker 429:



The Microphone 403 is coupled to a speech processing and compression block 405 where the continuous speech is **digitized and compressed**. ....[T]he data is provided from the receive data queue 425 to the **speech processing and decompression module 427 for processing and decompression**. The decompressed, processed speech is **then provided to an output device, such as the speaker 429**, for reproducing it as continuous speech 431.

EX1015, 6:57-7:26.

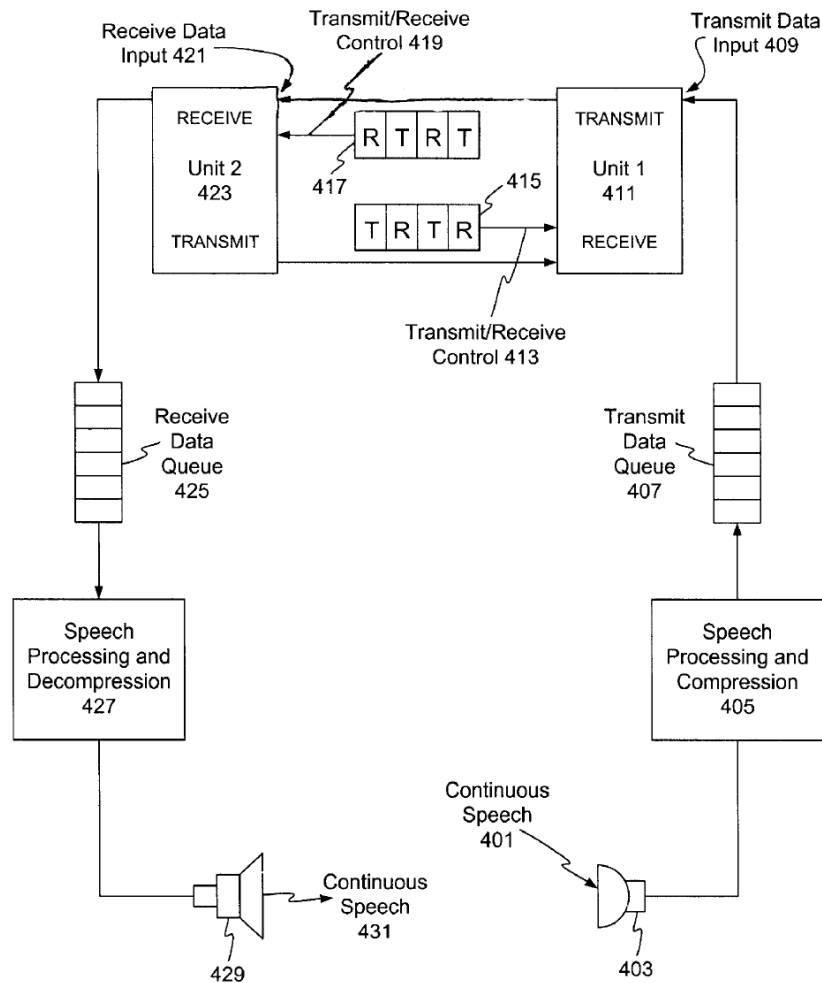
As explained in [1A], Gibson teaches that a signal can be encoded by introducing a “controlled amount of intersymbol” inference “at the transmitter, which can be removed at the receiver” using “partial-response (PR) signaling” (EX1022, 329) and then “precod[ing]” the signal “in such a way as to compensate for...intersymbol interference.” (i.e. *coding that reduces intersymbol (inter-symbol) interference*). (EX1022, 333). A POSA would have been motivated to combine Gibson with Walley to compensate for intersymbol interference in digital communication systems by encoding/decoding a digitized audio signal using Gibson’s precoding techniques to provide a transmitter which creates *wireless spread spectrum signal transmissions* that have been *encoded to reduce intersymbol interference*. [1A] (§III.E.2.b). A POSA would have understood that Gibson’s precoded transmission would require a *decoder...configured to decode reduced*

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*intersymbol interference coding*. EX1012, ¶¶289-291.

b. [3G]

Walley in view of Miyake, Gibson and Rappaport renders obvious this limitation. EX1012, ¶¶293-297.

Walley teaches a system which includes a transmitting/receiving units (411 and 423) which are separate from their corresponding speech processing and compression/decompression units (405 and 427):



EX1015, FIG. 4.

As explained in [3B], Walley teaches decoding performed by speech processing and decompression block 427. As explained in [1E] and [1F], Walley teaches that the spread spectrum transmitter includes a “modulator 213, for modulating the carrier frequency 215.” EX1015, 6:10-34. A POSA would have understood that the demodulations described in [1E] and [1F] would similarly be performed in Walley’s receiver depicted in FIG. 4 above (Unit 2, 423). Thus, Walley teaches *decoding is separate from said plurality of demodulations*.

5. *Claim 4*

See claim 2.

6. *Claim 5*

a. [5P]

Walley in view of Miyake, Gibson and Rappaport renders obvious this limitation. EX1012, ¶¶301-305.

As explained in Ground 1, [5P] recites materially the same limitations as [1P], and thus, Walley in view of Miyake, Gibson and Rappaport renders obvious *a wireless digital coded audio spread spectrum transmitter...configured to transmit a unique user code and a representation of an audio signal with a frequency range of 20 Hz to 20 Khz, wherein said digital coded audio spread spectrum transmitter is configured to wirelessly communicate with a digital audio spread spectrum receiver* for the reasons cited in Ground 2, [1P]. See §§III.E.2.a, §III.D.5.

As explained in [1P], a POSA would have understood that transmitting music

to speakers, headphones, or a portable phone's "hand unit" would require the transmitter (a "base unit" or for a "wireless unit[]" (such as a phone)) to be coupled to an audio source to provide music input signal. EX1012, ¶¶302-304 (citing EX1015, 6:52-56 ("instead of a continuous speech input...any manner of data could be substituted and the method described would be equally viable."), 11:49-51 ("The fidelity of the audio signal will decrease as the sampling rate of the input signal decreases.")) Thus, a Walley teaches a *transmitter operatively coupled to a portable audio player* (a "wireless unit" such as a phone) that is *configured to be moved in any direction during operation*. EX1012, ¶302-305.

b. [5A]

Walley in view of Miyake, Gibson and Rappaport renders obvious this limitation. EX1012, ¶¶306-311.

As explained in [1P], Walley teaches a system for transmitting audio having a frequency range of 20 Hz to 20 kHz.

As explained in [3b], Walley teaches a system in which an audio input signal is digitized and processed (by speech processing and compression block 405) prior to transmission. Thus, Walley teaches an *encoder* (speech processing and compression block 405) *configured to process signals in the frequency range of 20 Hz to 20 kHz for representation in said first representation of an audio signal*.

As explained in [1A], Gibson teaches precoding methods encode/decode a

transmission for reduced intersymbol interference in digital communication systems (i.e. *coding that reduces intersymbol (inter-symbol) interference*).

A POSA would have been motivated to combine Gibson's precoding techniques with Walley's speech processing and compression block 405 (*encoder*) to mitigate the "common problem" of intersymbol interference in digital data communication systems by encoding a digitized audio signal using Gibson's precoding techniques to *encode a first representation of an audio signal to reduce intersymbol interference associated with a transmitted representation of the audio signal*. A POSA would have understood that the addition of Gibson's precoding techniques to Walley's system is the use of a known technique (precoding) to improve a similar digital data communication system in the same way (to reduce intersymbol interference). EX1012, ¶¶307-310.

c. [5B]

Walley in view of Miyake, Gibson and Rappaport renders obvious this limitation. EX1012, ¶¶312-316.

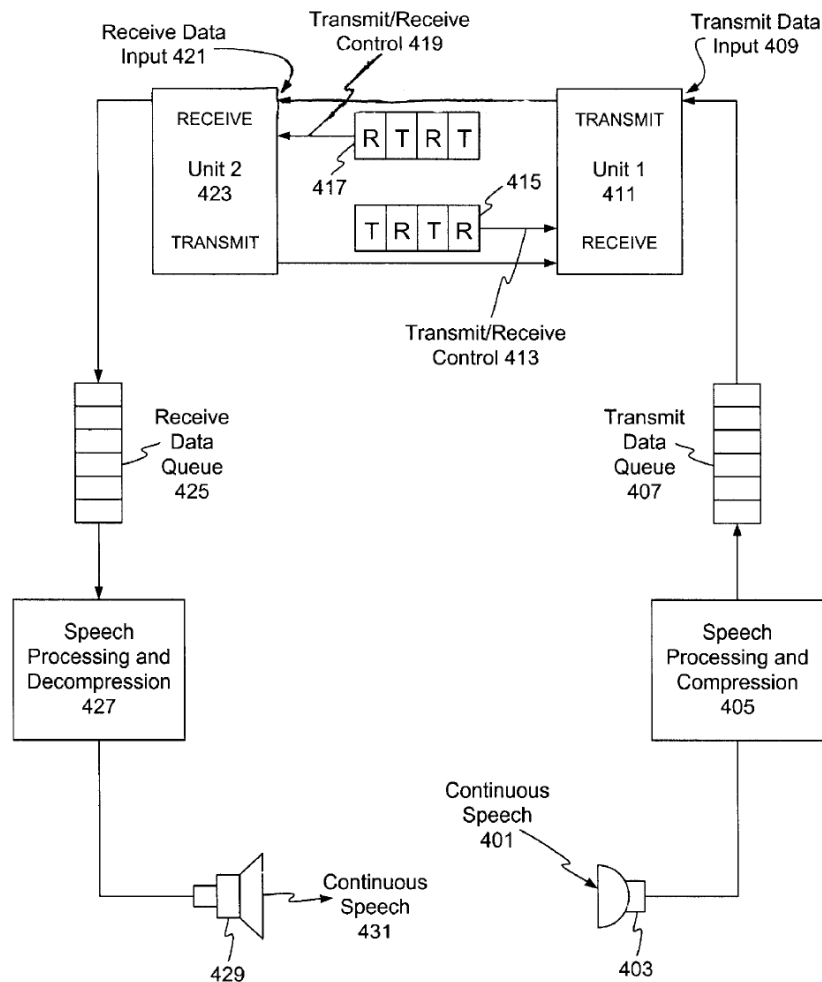
Walley discloses the use of a PN code to modulate a signal. *See* [1E] (citing EX1015, 5:13-44). Walley further discloses a spread spectrum transmitter which includes a "modulator 213, for modulating the carrier frequency 215." *See* [1E] (citing 6:10-34). As explained in [1E], a POSA would have understood that Walley's modulator 213 could include a DPSK modulator or an M-ary QAM, as disclosed in

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Rappaport. *See* [1E] (citing EX1018, 270-72, FIG. 5.24).

d. [5C]

Walley in view of Miyake, Gibson and Rappaport renders obvious this limitation. EX1012, ¶¶317-321.

As explained in [3G], Walley teaches a system which includes a transmitting/receiving units (411 and 423) which are separate from their corresponding speech processing and compression/decompression units (405 and 427):



As explained in [5B], Walley teaches an encoder (speech processing and compression block 405). As explained in [1E], [1F] and [5B], Walley teaches that the spread spectrum transmitter includes a “modulator 213, for modulating the carrier frequency 215.” EX1015, 6:10-34. A POSA would have understood that the modulations described in [1E], [1F] and [5B] would be performed in Walley’s transmitter depicted in FIG. 4 above (Unit 1, 411). Thus, Walley teaches *encoding is separate from said plurality of demodulations*.

e. [5D]

Walley in view of Miyake, Gibson and Rappaport renders obvious this limitation. EX1012, ¶¶322-324.

The term “independent” should be construed to mean “performed independent of any central control.” *See* §II.C.

Walley teaches a transmitter which transmits a modulated signal. EX1015, 6:10-34 (“The output of the modulator is coupled to a RF power amplifier 217 and the antenna for broadcasting the signal”). Walley discloses a receiver which uses a transmitter’s unique spreading code (“a dedicated code”) “to separate that system’s transmission from all others.” EX1015, 1:27-40; *see also id.*, 1:41-59, 5:33-44.

Walley does not teach whether the transmitter uses *independent code division multiple access communication*.

Miyake teaches a *transmitter...configured...to use independent code division multiple access communication* as Miyake teaches that “the spreading code set on the transmitter side should coincide with the spreading code set on the receiver side” and “those spreading codes should differ from those for the other channel users who also use this communication system.” EX1016, 6:63-7:18. The one-to-one relationship between Miyake’s receiver and transmitter teaches this definition as it does not require any centralized control. EX1012, ¶323. Additionally, Walley teaches that an orthogonal code is used to separate the transmissions of interest from the rest, so that the receiver only communicates with the transmitter of interest. EX1012, ¶323. Thus, Miyake alone and in view of Walley render obvious a *transmitter...configured...to use independent code division multiple access communication*.

A POSA would have been motivated to combine the spreading process of Walley with Miyake to provide a spreading process which creates user-specific spreading codes (*unique user code*) whose code lengths are adjusted to reduce noise/interference in order to allow each user’s respective transmitter/receiver to operate independent of the operation of another transmitter/receiver. See §§III.E.1, III.E.2.e. Thus, Walley in view of Miyake, Gibson and Rappaport renders obvious *unique user code* (Walley’s spreading code + Miyake’s user-specific code) which *distinguishes the transmitted representation of the audio signal from other*

*transmitted audio signals in the spread spectrum transmitter spectrum, said other transmitted audio signals not originating from said wireless digital coded audio spread spectrum transmitter.* EX1012, ¶¶322-324.

7. *Claim 6*

Claim 6 recites the same limitation as claim 2. Thus, claim 6 is rendered obvious by Walley in view of Miyake, Gibson and Rappaport for the same reasons. See §III.E.3.

8. *Claim 7*

Walley in view of Miyake, Gibson and Rappaport renders obvious this claim. EX1012, ¶¶327-330.

As explained in [1E], Rappaport teaches M-ary QAM. Rappaport teaches that “M” can be 64, and thus teaches *64-ary demodulation*:

The power spectrum and bandwidth efficiency of QAM modulation is identical to M-ary PSK modulation. In terms of power efficiency, QAM is superior to M-ary PSK. Table 5.5 lists the bandwidth and power efficiencies of a QAM signal for various values of  $M$ , assuming optimum raised cosine rolloff filtering in AWGN. As with M-PSK, the table is optimistic, and actual bit error probabilities for wireless systems must be determined by simulating the various impairments of the channel and the specific receiver implementation. Pilot tones or equalization must be used for QAM in mobile systems.

Table 5.5 Bandwidth and Power Efficiency of QAM [Zie92]

| $M$                          | 4    | 16 | 64   | 256 | 1024 | 4096 |
|------------------------------|------|----|------|-----|------|------|
| $\eta_B$                     | 1    | 2  | 3    | 4   | 5    | 6    |
| $E_b/N_o$ for BER= $10^{-6}$ | 10.5 | 15 | 18.5 | 24  | 28   | 33.5 |

EX1018, 272 (depicting Bandwidth and Power Efficiency of 4, 16, 64, 25, 1024 and 4096-ary QAMs); EX1012, ¶328.

9. *Claim 8*

Claim 8 recites the same limitation as claim 7. Thus, claim 8 is rendered

obvious by Walley in view of Miyake, Gibson and Rappaport for the same reasons.

*See* §III.E.8.

*10. Claim 9*

Claim 9 recites the same limitation as claim 7, except claim 7 refers to *demodulation* and claim 9 refers to the corresponding *modulation*. As explained in claim 7 above, Rappaport teaches 64-ary QAM, and thus, claim 9 is rendered obvious by Walley in view of Miyake, Gibson and Rappaport. *See* §III.E.8

*11. Claim 10*

Walley in view of Miyake, Gibson and Rappaport renders obvious this limitation. EX1012, ¶¶335-339.

As explained in [1P], Walley teaches “generic type spread spectrum controllers.” Walley teaches that “spread spectrum transmissions” require “low power.” EX1015, 1:63-65. Walley does not teach the frequency of its transmissions.

Rappaport teaches the availability of an unlicensed frequency band ranging from 2.4 GHz to 2.5 GHz which can be shared “[a]s long as radio transmitters use spread spectrum modulation and power levels below 1W”:

In the mid 1980s, the Federal Communications Commission provided unlicensed radio spectrum in the Industrial, Scientific and Medical (ISM) bands of...2400 MHz to 2483.5 MHz[.] As long as radio transmitters use spread spectrum modulation and power levels below 1W, they may share ISM spectrum on a secondary basis.

A POSA would have been motivated to combine the teachings of Walley and Rappaport to use *the Industrial Scientific and Medical 2.4 GHz band* for Walley's transmissions, because Walley teaches the use of "spread spectrum transmissions" that require "low power" and Rappaport teaches that this band can be freely used for such transmissions. EX1012, ¶¶336-338.

*12. Claim 11*

Claim 11 recites the same limitation as claim 10. Thus, claim 11 is rendered obvious by Walley in view of Miyake, Gibson and Rappaport for the same reasons. *See* §III.E.11.

*13. Claim 12*

Claim 12 recites the same limitation as claim 10, except claim 10 refers to the frequency of transmissions received by the receiver while claim 12 refers to the frequency of the transmissions from the transmitter. As explained in claim 10 above, a POSA would have been motivated to combine the teachings of Walley and Rappaport to use the Industrial Scientific and Medical 2.4 GHz band for Walley's transmissions, because Walley teaches the use of "spread spectrum transmissions" that require "low power" and Rappaport teaches that this band can be freely used for such transmissions. EX1012, ¶¶342-343; EX1015, 1:63-65; EX1018, 544; §III.E.11.

**F. Ground 3: Walley In View of Miyake, Gibson, Rappaport, and Drakoulis Renders Obvious Claims 1-12.**

*1. Overview of the combination; motivation to combine; expectation of success.*

In contrast to Ground 2 above, Petitioner applies the constructions set forth in Section II.C from the *Apple* Action for the terms “transmitter” and “audio source” for Ground 3. Below, Petitioner identifies how these terms are met by the combination of Walley and Drakoulis, and Petitioner otherwise adopts the arguments set forth in Ground 2 above.

Ground 3 relies on Walley in view of Miyake, Gibson, Rappaport, and Drakoulis. A POSA would have been motivated to combine the teachings of Walley, Miyake, Gibson, and Rappaport for the reasons provided in Ground 2.

A POSA would additionally have been motivated to combine these teachings with Drakoulis. As explained in Sections III.C.3 and III.E.2.a, Walley teaches a CDMA spread spectrum controller which addresses the “different requirement” of “wireless communication electronics” such as headphones, speakers and phones, and teaches the transmission of music to these devices from “wireless units” or a “base unit.”

Drakoulis is directed to an apparatus which “includes a **base unit 22 containing a high frequency transmitter** and a remote unit 24 which is capable of receiving the high frequency transmitted signal.” EX1021, 5:27-5:33. “**As shown in**

**FIG. 1, the base unit 22 is adapted to be coupled via jacks or connectors and electrical conductors to the signal source 10.”** EX1021, 5:34-37.

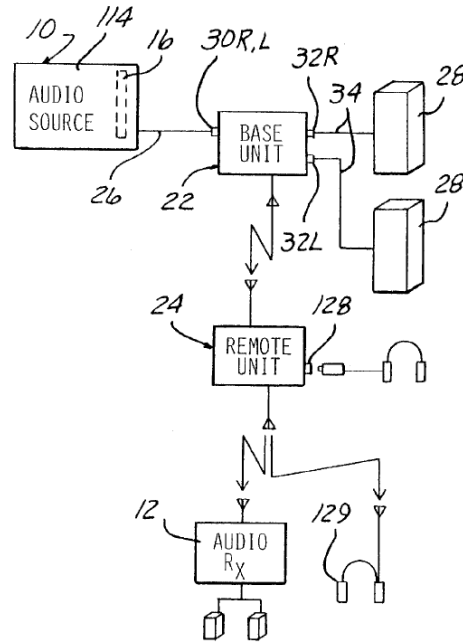


FIG. 1

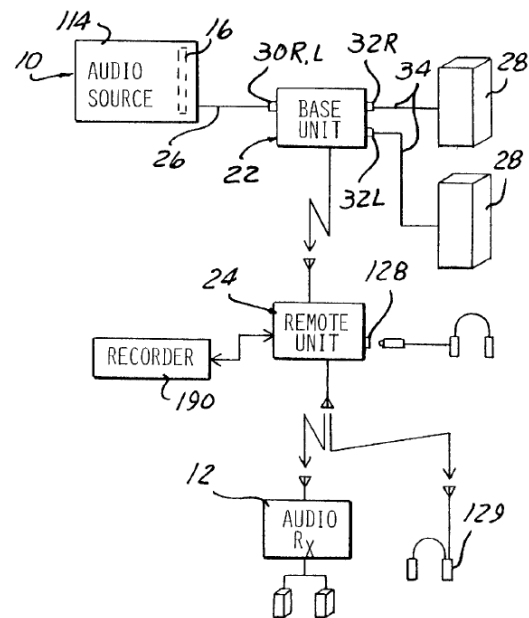


FIG. 6

EX1021, FIGS. 1, 6.

Drakoulis further teaches “a **stereo mini-input jack**...may also be mounted on the housing of the base unit 22 for receiving mini plug connectors attached to cables.” EX1021, 5:56-60.

Drakoulis teaches that “audio sources 10” include “a CD player, AM/FM tuner, tape deck, turntable, etc.” EX1021, 5:21-25. A POSA would have understood that these audio sources conventionally include an analog headphone jack. EX1012, ¶350.

A POSA would have been motivated to combine Drakoulis’s transmitter (which connects to an *audio source*’s headphone jack to wirelessly transmit audio

from the *audio source*) with Walley because Walley teaches “generic type spread spectrum controllers which can be used in a variety of applications” and Drakoulis teaches a transmitter which can advantageously add wireless transmission capabilities to a non-wireless audio source. EX1012, ¶¶347-351.

Moreover, it would be a simple substitution of one known element (Walley’s transmitter, such as a “wireless unit” or “base unit” capable of transmitting music) for another (Drakoulis’s transmitter, which is capable of transmitting music outputted from an audio source’s headphone jack) to obtain predictable results (a “wireless unit” or “base unit” capable of transmitting music outputted from an audio source’s headphone jack). EX1012, ¶¶347-352. A POSA would have had a reasonable expectation of success at combining Drakoulis’s “stereo mini-input jack” with Walley’s transmitters because Walley explains that “any manner of data could be substituted” for the exemplary “continuous speech input” disclosed by Walley, and a stereo mini-input jack is a conventional component that is routinely added to provide audio input to a device. EX1012, ¶¶347-352.

2. *Claims 1-2, 7, 10*

a. [1P]

Assuming claim 1’s preamble is limiting, Walley in view of Miyake, Gibson, Rappaport and Drakoulis renders obvious the preamble. EX1012, ¶¶354-358.

As explained in Ground 2, Walley in view of Miyake, Gibson, Rappaport and

Drakoulis renders obvious [1P] under the plain and ordinary meanings of “transmitter” and “audio source.” *See* III.E.2.a.

The term “transmitter” should be construed to mean “a device that can be connected into an analog headphone jack to wirelessly transmit an audio signal” and the term “audio source” should be construed to mean “a device for providing audio that has an analog headphone jack.” §II.C. As explained in Section III.F.1, Drakoulis teaches a *transmitter* (base unit 22) *coupled to a music audio source* (CD player, AM/FM tuner, tape deck) under these constructions.

A POSA would have been motivated to combine Drakoulis’s transmitter (which connects to an *audio source*’s headphone jack to wirelessly transmit audio from the *audio source*) with Walley because Walley teaches “generic type spread spectrum controllers which can be used in a variety of applications” and Drakoulis teaches a transmitter which can advantageously add wireless transmission capabilities to a non-wireless audio source. *See* §III.F.1.

Walley in view of Miyake, Gibson, Rappaport and Drakoulis thus render obvious a *wireless digital audio spread spectrum receiver, capable of mobile operation*, (Walley’s phone, speaker or headphones) *configured to receive a unique user code* (Walley’s spreading code combined with Miyake’s user-specific code) *and a high quality audio signal representation with a frequency range of 20 Hz to 20 kHz* (Walley’s 20 Hz to 20 kHz audio and high-fidelity music) *from a digital*

*audio spread spectrum transmitter* (Walley's music-transmitting wireless unit or base unit modified by Drakoulis to connect to a headphone jack), *said audio signal representation representative of audio from a portable audio source* (Drakoulis's cd player, radio or tape deck), *said digital audio spread spectrum receiver operative to communicate wirelessly with said digital audio spread spectrum transmitter*.

Elements [1A]-[1F] and claims 2, 7 and 10 are obvious for the same reasons as set forth in Ground 2. *See* §III.E.2-3, III.E.8, III.E.11.

3. *Claims 3-4, 8, 11*

As explained in Ground 2, [3P] corresponds to [1P], and thus, [3P] is rendered obvious by the combination of Walley, Miyake, Gibson, Rappaport and Drakoulis for the same reasons set forth above. *See* §III.F.2.

Elements [3A]-[3F] and claims 4, 8 and 11 are obvious for the same reasons as set forth in Ground 2. *See* §III.E.4-5, III.E.9, III.E.12.

4. *Claims 5-6, 9, 12*

a. [5P]

Assuming claim 5's preamble is limiting, Walley in view of Miyake, Gibson, Rappaport and Drakoulis renders obvious the preamble. EX1012, ¶¶361-364.

As explained in Ground 2, Walley in view of Miyake, Gibson and Rappaport renders obvious [5p] (*wireless digital coded audio spread spectrum transmitter* (Walley's "base unit" or for a "wireless unit[]" (such as a phone)) *operatively coupled to a portable audio player* (Walley's audio source) *and configured to*

*transmit a unique user code (Walley's spreading code combined with Miyake's user-specific code) and a representation of an audio signal with a frequency range of 20 Hz to 20 KHz (Walley's 20 Hz to 20 kHz audio and high-fidelity music), wherein said digital coded audio spread spectrum transmitter is configured to wirelessly communicate with a digital audio spread spectrum receiver and is configured to be moved in any direction during operation.*

As explained with respect to [1P], under the constructions for “transmitter” and “audio source” set forth in §II.C above, Walley in view of Miyake, Gibson, Rappaport and Drakoulis renders obvious *digital audio spread spectrum transmitter* (Walley's “base unit” or “wireless units” modified by Drakoulis to connect to a headphone jack) which transmits *audio from a portable audio source* (e.g., Drakoulis's cd player, radio or tape deck). EX1012, ¶¶362-363. A POSA would understand that Walley's transmitter (modified by Drakoulis) would connect to Drakoulis's audio source via a headphone jack, and renders obvious *transmitter operatively coupled to a portable audio player*.

Elements [5A]-[5D] and claims 6, 9 and 12 are obvious for the same reasons as set forth in Ground 2. *See* §§III.E.7, III.E.10, III.E.13.

#### **IV. MANDATORY NOTICES**

##### **A. Real Party-In-Interest**

The real parties in interest to this petition are Samsung Electronics, Co., Ltd.

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and Samsung Electronics America, Inc.

### **B. Related Matters**

The '627 patent is involved in the following district court actions: *One-E-Way, Inc. v. Dell Techs. Inc.*, 24-cv-1558 (W.D. Tex., filed December 18, 2024); *One-E-Way, Inc. v. Anker Innovations. Ltd.*, 24-cv-1559 (W.D. Tex., filed December 18, 2024); *One-E-Way, Inc. v. Samsung Electronics Co., Ltd.*, 24-cv-1561 (W.D. Tex., filed December 18, 2024).

The '627 patent was previously involved in the following actions: *One-E-Way, Inc. v. Apple Inc.*, 2-20-cv-06339 (C.D. CA); *One-E-Way, Inc. v. Apple Inc.*, 22-2200 (Fed. Cir.); *Apple Inc. v. One-E-Way*, IPR2021-00286, -00287.

### **C. Lead and Back-Up Counsel**

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**D. Service**

Petitioner consents to service by email on the following email address:

Samsung-OEW-IPR@gtlaw.com.

**V. FEES**

The required fee is being paid electronically through P-TACTS.

**VI. CONCLUSION**

For the reasons explained herein, Petitioner requests that IPR be instituted and the challenged claims be canceled.

Dated: September 16, 2025

Respectfully Submitted,

/ Trenton A. Ward/

Trenton A. Ward  
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IPR2025-01540

Patent No. 10,129,627

**CERTIFICATE OF COMPLIANCE**

This petition complies with the word count limits set forth in 37 C.F.R. §42.24(a)(i), effective May 2, 2016, because this Petition contains less than 14,000 words, excluding the parts of the petition exempted by 37 C.F.R. §42.24(a), as determined using the word count provided by Microsoft Word, which was used to prepare this Petition.

Dated: September 16, 2025

Respectfully Submitted,

/Trenton A. Ward/

Trenton A. Ward  
Reg. No. 59,157

IPR2025-01540

Patent No. 10,129,627

**CERTIFICATE OF SERVICE**

Pursuant to 37 C.F.R. §§42.6(e) and 42.105(a), the undersigned certifies that on September 16, 2025, I caused a true and correct copy of PETITION FOR INTER PARTES REVIEW OF CLAIMS 1-12 OF U.S. PATENT NO. 10,129,627, Exhibits 1001-1016, 1018, 1021-1030, and PETITIONER'S POWER OF ATTORNEY by UPS Next Day Air on the Patent Owner at the correspondence address of record for U.S. Patent No. 10,129,627 as follows:

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