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Paper 36
Date: February 27, 2026

UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE PATENT TRIAL AND APPEAL BOARD

APPLE INC.,
Petitioner,

v.

VARIA HOLDINGS LLC,
Patent Owner.

IPR2024-01362
Patent 8,381,974 B2

Before KEVIN F. TURNER, NORMAN H. BEAMER, and MARY C. HOFFMAN, *Administrative Patent Judges*.

BEAMER, *Administrative Patent Judge*.

DECISION
Final Written Decision
Determining All Challenged Claims Unpatentable
35 U.S.C. § 318(a)

I. INTRODUCTION

Apple Inc., Petitioner, filed a Petition (Paper 2, "Pet.") requesting an *inter partes* review of claims 1–19 of U.S. Patent No. 8,381,974 B2 (Ex. 1001, the "'974 patent"). Pet. 1. We instituted *inter partes* review of all the claims challenged in the Petition. Paper 7 ("Inst. Dec."). Varia Holdings LLC, Patent Owner, filed a Patent Owner Response to the Petition. Paper 14 ("PO Resp."). Petitioner filed a Reply and Patent Owner filed a Sur-Reply. Paper 17 ("Reply"); Paper 22 ("Sur-Reply"). An oral hearing was held on December 10, 2025, and a copy of the transcript was entered into the record. Paper 35 ("Tr.").

We have jurisdiction over this *inter partes* review under 35 U.S.C. § 6. This Final Written Decision is entered pursuant to 35 U.S.C. § 318(a). Based on the complete record, we find that Petitioner has shown, by a preponderance of the evidence, that claims 1–19 of the '974 patent are unpatentable.

II. BACKGROUND

A. Real Parties in Interest

Each party identifies itself as the real party in interest. Pet. 91; Paper 5, 2.

B. Related Matters

The parties identify *Varia Holdings LLC v. Apple Inc.*, Case No. 1:23-cv-07477-RPK-RML (EDNY) (the "District Court case") and co-pending *Inter Partes* Review Case Nos. IPR2024-01363 and IPR2024-01364 as related matters. Pet. 91; Paper 5, 2.

C. The '974 Patent

The '974 patent is directed to mobile communication devices enabled to output radio frequency signal data, such as a security key or an identifier, emulating an active or passive RFID (radio frequency identification) transponder. Ex. 1001, code (57). Emulation of an active RFID transponder involves a user selecting radio frequency signal data to output, and emulation of a passive RFID transponder involves outputting data in response to detecting for proximal presence of an RFID reader. *Id.*

Figure 1 is reproduced below.

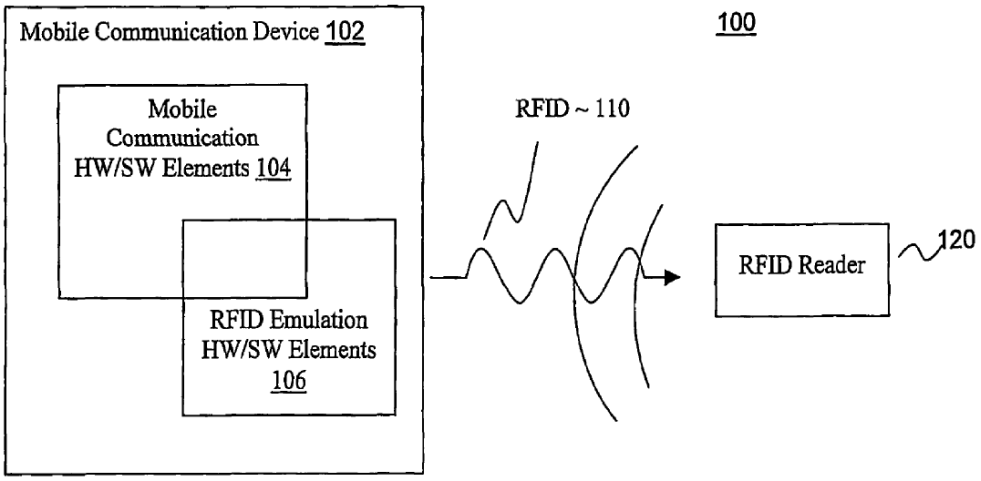


Figure 1

Figure 1 is a block diagram depicting mobile communication device 102, including mobile communication element 104, such as a wireless mobile phone, to perform its "primary function" — a user communicating with another user of another communication device (such as making a voice phone call). Ex. 1001, 3:30–37, 4:5–21. Figure 1 further depicts RFID element 106, for provision or transfer of a key or identifier in the form of a radio frequency signal 110, which may be read by a radio frequency identifier (RFID) reader 120. *Id.* at 3:40–45.

As indicated in Figure 1, mobile communication element 104 and RFID element 106 are shown to intersect, representing that substantial portions of the hardware and/or software elements employed to provide an RFID are the same elements employed to facilitate user communications, thus:

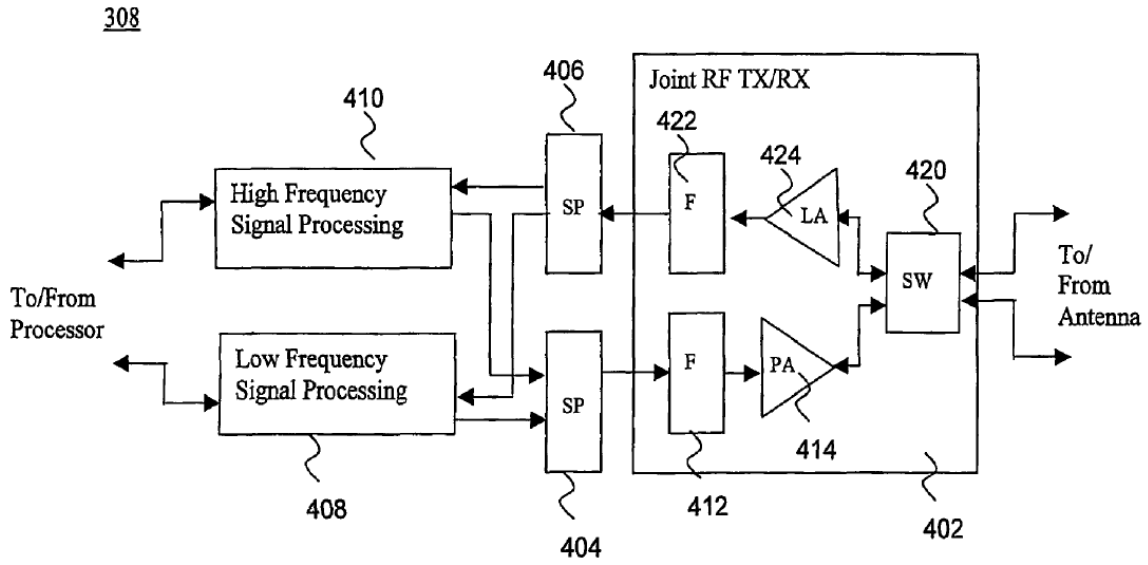
> advantageously leverag[ing] on existing elements of mobile communication device 102, and supplement[ing] them, to enable mobile communication device 102 to be able to provide a RFID, emulating a RFID transponder, as well as facilitating user communication.

Ex. 1001, 3:48–61.

RFID 110 may be any keys and/or identifiers, including security keys, such as garage door keys, exterior or interior door keys, or identifiers, such as, employee numbers, driver's license numbers, social security numbers, credit card numbers (optionally, including expiration dates), affinity program member identifiers, etc. Ex. 1001, 3:66–4:4. RFID element 106 can emulate an active or passive transponder — the former via outputting an RFID stored in device 102 in response to a user instruction; the latter outputted automatically, whenever device 102 is within the proximal presence, *i.e.* the operational space, of an intended RFID reader 120. *Id.* at 4:60–5:4.

Emulating the output of an active or passive transponder in a mobile communication device alleviates the problem of a "person having to carry a number of physical keys and access/identification cards/tags to gain access to secured premises, such as one's home, office, parking garage, and so forth." Ex. 1001, 1:45–48.

Mobile communication device 102 includes a transceiver, illustrated in Figure 4 reproduced below. Ex. 1001, 2:6–7, 5:14–17.



The transceiver of Figure 4 includes joint radio frequency (RF) transmit/receive (TX/RX) section 402, separate signal processing sections 408 and 410 for a range of higher frequencies and a range of low frequencies, switch 404,[1] and splitter 406. Ex. 1001, 6:56–7:12. For transmission, switch 404 switches between the output of high frequency signal processing 410 and the output of low frequency signal processing 408 to the transmit path of section 402. *Id.* at 7:5–8. High frequency signal processing 410 performs the transmit and receive signals of a voice call in the GHz range, and low frequency signal processing 408 handles the output signal of the RFID to emulate either an active or a passive transponder in the MHz range. *Id.* at 7:14–27.

[1] We agree with Petitioner that component 404 should be labeled "SW," indicating that it is a switch, rather than "SP." Pet. 5, n.2.

D. Illustrative Claim

Independent claim 1 is illustrative of the challenged claims, and follows:

[1.pre] A method for providing a radio frequency identification (RFID) from a switchable mobile communications device capable of RFID communication and voice call communication, the method comprising:

[1.1] receiving, by the mobile communications device, an instruction to transmit first RFID transponder data;

[1.2] switching a transceiver of the mobile communications device from a first state to a second state upon reception of said instruction, the transceiver configured to output voice call signals in the first state and to output RFID transponder signals in the second state; and

[1.3] outputting the first RFID transponder data, by the transceiver as an RFID transponder signal.

Pet. vi (bracketed numbering by Petitioner); Ex. 1001, 9:26–38.

E. Asserted Grounds of Unpatentability

Petitioner contends that claims 1–19 are unpatentable as follows:[2]

Claim(s) Challenged	35 U.S.C. §	Reference(s)/Basis
1–3, 5–9, 11–13, 16–19	103	Willgert,[3] Mooney[4]
1, 3, 5–9, 11	103	Willgert
3–6, 10, 11, 13–17	103	Willgert, Mooney, Holloway,[5] Pitroda[6]

Pet. 1–2. Petitioner supports its challenges with a Declaration and a Supplemental Declaration of Dr. Zhi Ding. Exs. 1003, 1063.

III. ANALYSIS OF PETITIONER'S CHALLENGES

A. The Applicable Law

To prevail in its grounds for unpatentability during trial, Petitioner must demonstrate by a preponderance of the evidence that the claims are unpatentable. 35 U.S.C. § 316(e); 37 C.F.R. § 42.1(d). "In an IPR, the

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[2] The Leahy-Smith America Invents Act, Pub. L. No. 112-29, 125 Stat. 284 (2011) ("AIA"), amended 35 U.S.C. §§ 102, 103 effective March 16, 2013, which is after the '974 patent's June 31, 2012 filing date. *See* Ex. 1001, code (22). Therefore, the pre-AIA version of Section 103 applies.

[3] Willgert, US 2005/0083177 A1, filed Nov. 6, 2002, published Apr. 21, 2005. Ex. 1004.

[4] Mooney et al., US 2003/0045235 A1, filed Sep. 5, 2001, published Mar. 6, 2003. Ex. 1005.

[5] Holloway et al., WO 02/49322 A2, filed Dec. 11, 2001, published June 20, 2002. Ex. 1006.

[6] Pitroda, US 7,308,426 B1, filed Aug. 11,1999, issued Dec. 11, 2007. Ex. 1007.

petitioner has the burden from the onset to show with particularity why the patent it challenges is unpatentable." *Harmonic Inc. v. Avid Tech., Inc.*, 815 F.3d 1356, 1363 (Fed. Cir. 2016) (citing 35 U.S.C. § 312(a)(3) (2012) (requiring *inter partes* review petitions to identify "with particularity . . . the evidence that supports the grounds for the challenge to each claim")). This burden of persuasion never shifts to the patent owner. *See Dynamic Drinkware, LLC v. Nat'l Graphics, Inc.*, 800 F.3d 1375, 1378 (Fed. Cir. 2015) (discussing the burden of proof in *inter partes* review).

A patent claim is unpatentable under 35 U.S.C. § 103 if the differences between the claimed subject matter and the prior art are such that the subject matter, as a whole, would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. *KSR Int'l Co. v. Teleflex Inc.*, 550 U.S. 398, 406 (2007). The question of obviousness is resolved on the basis of underlying factual determinations including (1) the scope and content of the prior art; (2) any differences between the claimed subject matter and the prior art; (3) the level of ordinary skill in the art; and (4) when in evidence, objective indicia of nonobviousness (also called secondary considerations), such as commercial success, long-felt but unsolved needs, and failure of others. *Graham v. John Deere Co.*, 383 U.S. 1, 17–18 (1966). We analyze the grounds based on obviousness in accordance with the above-stated principles.

B. Level of Ordinary Skill in the Art

Determining whether an invention would have been obvious under 35 U.S.C. § 103 requires resolving the level of ordinary skill in the pertinent art at the time of the effective filing date of the claimed invention. *Graham*,

383 U.S. at 17. The person of ordinary skill in the art is a hypothetical person who knows the relevant art. *In re GPAC Inc.*, 57 F.3d 1573, 1579 (Fed. Cir. 1995). Factors in determining the level of ordinary skill in the art include the types of problems encountered in the art, the sophistication of the technology, and educational level of active workers in the field. *Id.* One or more factors may predominate. *Id.*

Petitioner's expert contends that a person of ordinary skill in the art (POSITA):

> [W]ould have been someone knowledgeable in mobile communication devices and components used therein, cellular radio systems, and wireless communications, such as those used for voice calling and radio frequency identification (RFID). That person would have at least a Bachelor's degree in Electrical Engineering, with a background in radio frequency communications as well as approximately two years of experience working with or researching radio frequency communication systems.

Ex. 1003 ¶ 20.

Patent Owner "disputes the narrow range of educational experiences in the Petition's POSITA definition, but does not otherwise dispute the remaining portion of the definition." PO Resp. 12. Patent Owner contends that person of ordinary skill in the art:

> [W]ould have been someone "with at least a Bachelor's degree in Electrical Engineering, Computer Science, or a related field, with a background in radio frequency communications and software development, as well as approximately two years of experience working with or researching radio frequency communication systems. Lack of work experience can be remedied by additional education, and vice versa."

PO Resp. 12 (citing Ex. 2004 ¶ 34).[7]

Based on a review of the record, we adopt Patent Owner's proposed level of ordinary skill in the art, with its inclusion of a Computer Science background, because it is consistent with the evidence of record, including the asserted prior art and '974 patent specification. *Okajima v. Bourdeau*, 261 F.3d 1350, 1355 (Fed. Cir. 2001). However, our Decision would not be altered if Petitioner's definition applied.

C. Claim Construction

In *inter partes* reviews, the Board interprets claim language using the district-court-type standard, as described in *Phillips v. AWH Corp.*, 415 F.3d 1303 (Fed. Cir. 2005) (en banc). *See* 37 C.F.R. § 42.100(b) (2023). Under this standard, claim terms have their ordinary and customary meaning, as would be understood by a person of ordinary skill in the art at the time of the invention, in light of the language of the claims, the specification, and the prosecution history. *See Phillips*, 415 F.3d at 1313–14. Claim terms need only be construed to the extent necessary to resolve the controversy. *Nidec Motor Corp. v. Zhongshan Broad Ocean Motor Co. Matal*, 868 F.3d 1013, 1017 (Fed. Cir. 2017).

Petitioner states that "[n]o formal claim constructions are required in this proceeding." Pet. 6. However, Petitioner notes that "preliminary" claim constructions were proposed by the parties in the District Court case. Pet. 7–9. The only potential relevance of those proposed constructions here is for Petitioner's challenge to claims 1, 3, 5–9, and 11 as obvious over Willgert alone (which, as discussed below, we do not consider). Pet. 60–62.

[7] Exhibit 2004 is the Declaration of Michael I. Shamos, Patent Owner's expert.

As elaborated below, Patent Owner proposes constructions for the claim terms "wireless mobile phone," "voice call signals," and "RFID transponder signal/data." PO Resp. 14–25.

1. Wireless Mobile Phone

Patent Owner adopts as its construction of "wireless mobile phone" the following statement in the specification:

> The term "wireless mobile phone" ***as used herein***, including the specification and the claims, ***refers to*** the class of telephony devices equipped to facilitate a user in communicating with another user of another communication device, notwithstanding the user's movement around different geographic areas, so long the wireless mobile phone is in contact with a base/service station of a wireless network service provider . . . . The other user/communication device may be mobile or land line based.

PO Resp. 14–15 (citing Ex. 1001, 4:11–21; Ex. 2004 ¶ 43). Patent Owner further argues that this definition implies that:

> • A POSITA would have understood that a "wireless mobile phone" requires communication through a base/service station of a wireless network service provider.
>
> • A POSITA would have understood that a "wireless mobile phone" transmits and receives its telephony signals over a network of a wireless network service provider.
>
> • In situations where the other user's device is mobile, a POSITA would have understood that telephony signals would transmitted over the network of a wireless network service provider.
>
> • Where the other user device is land line based, a POSITA would have understood that telephony signals are transmitted in part over the network of a wireless network service provider.

PO Resp. 16 (citing Ex. 2004 ¶¶ 44, 45, 47).

We agree with Patent Owner's description of the characteristics and operation of a wireless mobile phone, which are not in dispute. Also, the Specification's description of wireless mobile phones is relied on by Patent Owner in its arguments regarding the construction of "voice call signal," as discussed below.

Nonetheless, Petitioner argues that it is unnecessary to construe the term, "wireless mobile phone." Reply 4. We agree. The term "wireless mobile phone" is only used in dependent claim 19 (not in independent claim 12, as Patent Owner alleges), and the principal reference relied on by Petitioner (Willgert) explicitly discloses the use of a mobile telephone. Ex. 1001, 12:2; Ex. 1004 ¶¶ 30–32. For these reasons, and because our analysis of the issues set forth below is not dependent on Patent Owner's proposed construction, it is unnecessary to adopt Patent Owner's construction or otherwise construe the term "wireless mobile phone."

2. "Voice Call Signals"

a) Patent Owner's Arguments Construing "Voice Call Signals"

Patent Owner proposes that "voice call signal(s)" be construed as "transmit and receive signal[s] of a voice call over a network of a wireless network service provider." PO Resp. 16–20. Patent Owner relies on the fact that the specification teaches a "wireless mobile phone" that can perform telephony and emulate an RFID transponder, and that the "primary communication function" of the device is to transmit and receive "signals of a voice call," which "facilitate a user in communicating with another user of another communication device." *Id.* at 16–17 (citing Ex. 1001, 3:53–55, 7:14–17; Ex. 2004 ¶ 46). Patent Owner also relies on the above-discussed aspects of the '974 patent emphasizing that the mobile communication and

RFID elements of the invention share common components. *Id.* at 17–18 (citing Ex. 1001, Fig. 1, 3:48–55). Furthermore, argues Patent Owner, the claims require that a mobile communications device "outputs/transmits 'voice ***call signal[s]***,'" and therefore a "POSITA would have understood that 'voice call signal[s],' are the signals that carry a voice call from one user to the user of another device." *Id.* at 18 (citing Ex. 2004 ¶ 46).

Patent Owner also relies on statements made during the prosecution of the application that led to the issuance of the parent to the '974 patent, US Patent No. 8,127,984 B2 (the parent '984 patent).[8] PO Resp. 18–19. In particular, Patent Owner alleges that Cooper Application US 2002/0123325 A1 (Ex. 2007) ("Cooper"), which was cited during the '984 prosecution and disclosed "using a Bluetooth-equipped headset to transmit voice data to a telephone terminal," was distinguished as not teaching the required "output voice call signals" limitations of the claims. *Id.* at 18 (citing Ex. 1008, 38–39, 65–70). Based on this, Patent Owner argues that Petitioner's reliance on the combination of Willgert and Mooney, discussed further below, which also involves a Bluetooth-equipped headset, cannot satisfy the voice call signal requirements of the claims. *Id.* at 19–20 (citing Ex. 2004 ¶¶ 58–59). Patent Owner argues that signals to Bluetooth devices such as disclosed in Cooper and Willgert are "not carried over the network of a wireless network service provider to call a user of another communications device," and therefore do not satisfy Patent Owner's definition of "voice call signals." *Id.* at 20.

[8] The prosecution of the '974 patent contains nothing relevant to the issues here. *See generally* Ex. 1002; Ex. 1003 ¶ 44.

b) Petitioner's Reply Re "Voice Call Signals"

Petitioner argues that the "voice call signal" limitations broadly encompass "a potential 'used to convey information' relating to a telephone call established for the purpose of transmitting voice rather than data communications." Reply 14 (citing Ex. 1063 ¶ 24). Petitioner asserts that this definition is in accord with the plain meaning of "voice call signal," and that there is no contrary definition of the term, or disavowal of coverage, in the '974 patent or prosecution history. *Id.* at 15. In particular, Petitioner argues that there is no basis to limit "voice call signal" to "direct communications with a base station associated with a network service provider." *Id.* Petitioner asserts that Patent Owner mischaracterizes the prosecution history of the parent '984 patent — that the Cooper reference was distinguished because it did not use the same hardware to transmit both Bluetooth and RFID data, rather than by an argument that the Bluetooth signal was not a voice call signal. *Id.* at 16 (citing Ex. 1008, 39). In fact, argues Petitioner, the Examiner found that the Bluetooth signal in Cooper was a voice call signal. *Id.* at 17 (citing Ex. 1008, 66).

c) Patent Owner's Sur-Reply Re "Voice Call Signals"

Patent Owner argues that Petitioner's construction is overbroad and ignores the specification and prosecution history of the '974 patent. Sur-Reply 15. Patent Owner submits that "the claims and specification of the '974 patent make clear that 'voice call signals' are signals that carry a voice call from one user to another over the network of a wireless network service provider." *Id.* at 16. Patent Owner further argues that the above-discussed specification definition of "wireless mobile phone" supports its position. *Id.* at 17, n.6.

d) Analysis Re Construing "Voice Call Signals"

We conclude that it is unnecessary to define "voice call signal." Patent Owner's construction would read into the term additional limitations that are for the most part already set forth in the claims: "a switchable mobile communications device capable of . . . voice call communication" (claims 1, 8, 12); "output a voice call signal for transmission over a wireless network" (claim 12); "wherein the mobile communication device is a selected one of a wireless mobile phone and a personal digital assistant equipped with communication capability" (claim 19). Thus the claims require a mobile communications device that is capable of communicating a voice call signal, but do not restrict the voice call signal to only be communicated by a mobile communications device. Likewise, claim 12 (but not claims 1 or 8) requires the voice call signal to be transmitted over a wireless network, but does not restrict transmission to only a wireless network, and does not restrict the wireless network to "a network of a wireless network service provider," as Patent Owner would require.

We also agree that there is nothing in the '984 parent prosecution history that supports Patent Owner's assertion that the Examiner found that the Bluetooth signal of Cooper was not a voice call signal. Cooper was distinguished because:

> The term "transceiver," however, is well understood by those of ordinary skill in the art. One of ordinary skill in the art would not reasonably interpret a "transceiver" so broadly as to

> incorporate an entire mobile device's circuitry, and in particular to be read on by two separate transmitters, as Cooper teaches.

Ex. 1008, 40.

On the other hand, we agree with Patent Owner that Petitioner's construction is overbroad, covering information from a phone bill, for example. *See* Sur-Reply 15.

Notwithstanding the parties' arguments, the term "voice call signal" is well understood in the context of telephone communications, and there is no need to define it further. In particular, for the '974 patent claims, voice call signals may be transmitted and received "over a network of a wireless network service provider," to use Patent Owner's language, but are not limited to such networks. Specifically, there is no reason why a voice call signal cannot be transmitted over a Bluetooth network. At most, the initial portion of Patent Owner's proposed construction would apply to define "voice call signal" — "transmit and receive signal[s] of a voice call." But that adds nothing to the term "voice call signal" itself.

3. "RFID Transponder Signal/Data"

a) Patent Owner's Arguments Construing "RFID Transponder Signal/Data"

Patent Owner proposes that "RFID transponder signal(s)" be construed as "RFID signal[s] emulated by a mobile communications device without the use of a physical RFID transponder." PO Resp 20.[9] Patent Owner relies on the fact that, throughout the '974 specification, all references to providing an RFID signal or data are couched in terms of a

[9] Patent Owner proposes commensurate constructions for "RFID transponder data . . . ." terms. PO Resp. 20.

transceiver "emulating" an RFID transponder. PO Resp. 21–22; Sur-Reply 8 ("*every single instance* of the phrase 'RFID transponder' or 'transponder' in the specification of the '974 patent is preceded by the word 'emulate,' 'emulating,' or 'emulation'"). For example:

> "EMULATED RADIO FREQUENCY IDENTIFICATION" (Title).
>
> "emulating outputting of the data by either an active or a passive RFID transponder" (Abstract).
>
> "RFID Emulation" (Figure 1)
>
> "the present invention is related to an emulated radio frequency data input method" (Field Of The Invention, 1:20–21).
>
> "Embodiments of the present invention includes an emulated RFID method . . . ." (Detailed Description Of Embodiments Of The Invention, 2:23–24).
>
> "illustrative embodiments of the present invention . . . provide a RFID, emulating a RFID transponder . . . ." (Overview, 3:56–60).
>
> "[D]evice 102 outputs the selected RFID as instructed, emulating an active RFID transponder . . . ." (Method, 4:62–64).
>
> "Thus . . . a novel emulated RFID input method . . . has been described." (Conclusion And Epilogue, 9:10–11).

Patent Owner argues that

> A POSITA reading the claims of the '974 patent in light of the teachings and disclosures in the specification would have understood that the purpose of the invention is to emulate one or more RFID transponders within a mobile communication device, without the need for an actual physical transponder . . . . A POSITA would have understood that none of the Challenged Claims read on or otherwise requires a physical RFID transponder that outputs a radio frequency signal.

PO Resp. 22 (citing Ex. 2004 ¶¶ 49, 51). Patent Owner argues that applicable authorities require that, in this case, the specification's description of the "present invention" as including emulation is an implicit disavowal of embodiments not involving emulation. *Id.* at 22–23 (citing *On Demand Mach. Corp. v. Ingram Indus., Inc.*, 442 F.3d 1331, 1340 (Fed. Cir. 2006); *Poly-Am., L.P. v. API Indus., Inc.*, 839 F.3d 1131, 1136 (Fed. Cir. 2016)). Patent Owner argues that it is not limiting the claims to disclosed embodiments because "[i]gnoring emulation would ignore every embodiment disclosed in the '974 patent." Sur-Reply 6.

Patent Owner also relies on dependent claim 6, which requires "outputting ***emulating*** output of the second RFID transponder data [as a second radio frequency signal] by an RFID transponder of a passive type." PO Resp. 23; Sur-Reply 10–11. Patent Owner argues that this means that the RFID signal is "emulated by a mobile communications device without a physical transponder," and that this interpretation would apply to all other claims that use the RFID signal terminology. PO Resp. 23–24 (citing Ex. 2004 ¶¶ 51–54).

In addition, Patent Owner invokes the prosecution history of the application that led to the issuance of the '984 patent that is parent to the '974 patent. PO Resp. 6–8, 24–25. During that prosecution, the Office rejected all then-pending claims as anticipated by Zalewski et al., US 6,771,981 B1. Ex. 1008, 285; Ex. 2001. "Zalewski disclosed 'an RFID transponder 110' embedded in a removable cover for a phone or other device 'such as an MP3 player.'" PO Resp. 6 (citing Ex. 2001, 7:63–8:3). Patent Owner argued that the claims did "not recite using a transponder," but instead "recite[] instructing a component of a mobile phone to *emulate*

output by a transponder." Ex. 1008, 276. Patent Owner submitted that the embedded transponder used in Zalewski "is not a component that **emulates** an output by an active RFID transponder, being itself an RFID transponder." *Id.* at 277. To like effect, Ex. 1008, 236 ("Zalewski does not teach . . . emulating output of the first data by an RFID transponder").

b) Petitioner's Reply Re "RFID Transponder Signal/Data"

Petitioner submits that the plain meaning of the RFID limitations would encompass "a potential 'used to convey information' using radio waves to achieve automatic identification of objects and people from one point to another." Reply 5 (citing Ex. 1063 ¶¶ 19–22). Petitioner argues that there is no limitation on the hardware used to generate the RFID signals under this construction, and there is no justification for departing from this plain meaning in the intrinsic record in the form of a definition or disavowal of claim scope. *Id.* at 5–6 (citing Ex. 1063 ¶ 22). Petitioner submits that the use of "emulate" in the disclosures of exemplary embodiments are not "clear and unambiguous" statements limiting invention scope. *Id.* at 18 (citing *Poly-Am., L.P.,* 839 F.3d at 1133). In addition, argues Petitioner, none of the independent claims use the term "emulate," and the fact that dependent claim 6 does use that term undercuts any reason to insert it into the independent claims. *Id.* at 7.

In regard to Patent Owner's inclusion of the requirement that the emulation be "without the use of a physical RFID transponder," Petitioner argues that this is an improper negative limitation, because it lacks the necessary support in the specification. Reply 8–10 (*citing Omega Engineering, Inc v. Raytek Corp.*, 334 F.3d 1314, 1333 (Fed. Cir. 2003)). Petitioner submits that there is nothing in the specification's generic

description of the architecture of the transceiver that requires the disclosed "transceiver" to exclude a "physical RFID transponder." *Id.* (citing Ex. 1001, Fig. 4, 6:56–7:32; Ex. 1063 ¶¶ 29–40).

Petitioner also disputes Patent Owner's reliance on the statements in the '984 patent prosecution history distinguishing Zalewski, arguing that the term "***physical*** RFID transponder" was not referenced, and because the statements that Patent Owner now relies on were not the basis for allowance of the '984 patent. Reply 12–14 (citing Ex. 1008, 18, 277).

Petitioner further argues that the actual import of the use of "emulate" (or the like) in the '974 specification is in the sense of "functional emulation," reflecting that the claimed mobile communications device has the capability of making a transmission from the mobile communications device of an RFID signal be perceived by an external RFID reader as if it were transmitted from a separate, stand-alone RFID transponder. Reply 10–11 (citing Ex. 1063 ¶ 35). Petitioner points to the disclosure in the specification of re-using or sharing components that serve both the output of voice call signals and RFID transponder signals, "advantageously leverag[ing] [] existing elements of mobile communication device." *Id.* (citing Ex. 1001, Fig. 4, 3:56–61). Petitioner argues that the specification "contemplates a mobile device's transceiver being configured to generate RFID signals without being limited in hardware." *Id.* at 11 (citing Ex. 1063 ¶¶ 29–40).[10] Therefore, even if the claims were construed to encompass

[10] Petitioner also cites the Holloway reference as background art evidence of the known use of a physical RFID transponder in a device for functional emulation of an RFID smart card. Reply 12 (citing Ex. 1006, 4:21–28, 6:22–26, 9:4–15, 10:16–27; Ex. 1063 ¶¶ 29–40).

functional emulation, there would be no basis to require exclusion of a physical RFID transponder. *Id.*

c) Patent Owner's Sur-Reply Re "RFID Transponder Signal/Data"

Patent Owner argues that Petitioner's construction of the RFID signal terms improperly relies on extrinsic evidence and ignores the claim language, specification, and prosecution history. Sur-Reply 4–6. Patent Owner points out that:

> "RFID transponder" is never used as a noun in the claims of the '974 patent. "RFID transponder" is always an adjectival phrase, used to modify "signal" or "data." That is consistent with emulation — a signal or data that mimics a given source (a transponder) but delivered from other hardware (a transceiver in the claims of the '974 patent).

Sur-Reply 7. Patent Owner disputes Petitioner's argument that Patent Owner is attempting to limit the claims to preferred embodiments that disclose emulation, responding that "[t]his is not a case of an 'exemplary embodiment' . . . . [i]t is every embodiment." *Id.* at 9.

Patent Owner relies on the claim language, "[a] transceiver . . . configured to output . . . RFID transponder [signals or data]," as "only mak[ing] sense if the transceiver is not itself an RFID transponder." Sur-Reply 10. Patent Owner reasons that if the transceiver were an RFID transponder, then it would be redundant to specify that it outputs RFID transponder signals. *Id.* Patent Owner also challenges Petitioner's argument that the presence of "emulating" in dependent claim 6 undercuts construing dependent claim 1 to include emulation, arguing instead that the requirement that claim terms be interpreted consistently means that all the claims require emulation and consequently the lack of a physical RFID transponder. *Id.* at

10–11 (citing *Rexnord Corp. v. Laitram Corp.*, 274 F.3d 1336, 1342 (Fed. Cir. 2001)).

In regard to Petitioner's position that the references in the '974 patent to emulation is meant to convey "functional emulation," Patent Owner argues that there is no support for this interpretation, and that mere incorporation of a transponder into another device is not emulation of the transponder, because "an RFID transponder cannot emulate itself." Sur-Reply 12–14.

d) Analysis Re Construing "RFID Transponder Signal/Data"

We conclude that it is unnecessary to formalize a comprehensive construction for the RFID transponder signal or data terms — it is sufficient for purposes here to conclude that the claims encompass Petitioner's "functional emulation" articulation. *See* Reply 10–11. That is, the purpose of the frequent references to "emulated," "emulation," or the like in the '974 patent is to emphasize the fact that the mobile communications device of the claims has a dual role: to provide voice call communications, and to transmit RFID transponder data. In the latter role, transmitted RFID transponder data appears to an RFID reader to have been transmitted from an ordinary RFID transponder. But there is no need to rewrite the claims to restore the emulation terms, given that, as we discuss further below, Patent Owner deliberately removed those terms during prosecution.

The functional emulation implicit in the '974 specification and claims serves to address the problem that the '974 patent describes:

> [T]he world has become a lot more complex in recent years . . . .
>
> [I]t is not uncommon to find a person having to carry a number of physical keys and access/identification cards/tags to gain access to secured premises, such as one's home, office, parking

> garage, and so forth. Additionally, the person is likely to carry a number of remote security control devices, such as a key with remote control for gaining access to his/her vehicle, a garage door opener for gaining access to the person's garage at home, and so forth. The person is also likely to carry a number of affinity identification cards with member identifiers identifying the person as being affiliated with certain co-op or frequent patronage programs, such as wholesale discount retailers, airline or hotel frequent traveler program, and so forth, that entitle the person to certain benefits, such as discounts or rewards.

Ex. 1001, 1:26–59. The '974 patent purports to ameliorate this problem by incorporating RFID capability into a mobile communications device such as a wireless mobile phone, so that:

> [S]ubstantial portions of the hardware and/or software elements employed to provide a RFID, are the same elements employed to facilitate . . . a user in communicating with another user . . . .
>
> [To] advantageously leverage on existing elements of mobile communication device 102, and supplement them, to enable mobile communication device 102 to be able to provide a RFID, emulating a RFID transponder, as well as facilitating user communication.

Ex. 1001, 3:50–61. Thus, "a novel emulated RFID input method, using a mobile communication device . . . . advantageously improved the ease of use for a user to provide data captured in a device to another system . . . ." *Id.* at 9:10–15.

This functional emulation solution is served regardless of how the specific RFID transceiver is implemented — the '974 specification specifically provides for both software and hardware implementations. *Id.* at 2:22–26 ("Embodiments of the present invention includes . . . certain hardware and/or software embodied therein for the practice of the emulated

RFID method"), 3:33–34 ("mobile communication device 102 is equipped with hardware and/or software elements"), 3:50–52 ("substantial portions of the hardware and/or software elements employed to provide a RFID"), 5:12 ("A Hardware/Software Implementation"). There is no reason why one version of the hardware used to emulate the RFID function could not be RFID transponder circuitry. The issue is not whether an RFID transponder can emulate itself, but rather whether RFID transponder circuitry incorporated into a mobile communications device can be used to allow the mobile communications device to emulate a separate RFID transponder. For example, rather than requiring the person described in the Background of the '974 patent to carry both a mobile phone and a "key with remote control for gaining access to his/her vehicle," they need only carry the mobile communications device of the claims.

The statement in the '974 patent that "the present invention is related to an emulated radio frequency data input method" (Ex. 1001, 1:20–21), and the other references to emulation, are consistent with a conclusion that the claims encompass the "functional emulation" option as described above. However, there is no basis for adding the negative limitation proposed by Patent Owner ("without the use of a physical RFID transponder"). *Omega Engineering*, 334 F.3d at 1333 (rejecting a construction because "neither the plain text of the claims, the specification, nor the file wrapper justifies the imposition of this negative limitation"). *See also BillJCo, LLC v. Apple Inc.*, No. 2023-2189, 2023-2190, 2025 WL 1417957, at *1 (Fed. Cir. May 16, 2025):

> Our court has "identified claim constructions that exclude a particular element as including a 'negative limitation' and held that such exclusions must find support either in 'the words

> of the claim' or through an 'express disclaimer or independent lexicography in the written description that would justify adding that negative limitation.'" *Ethicon LLC v. Intuitive Surgical, Inc.*, 847 F. App'x 901, 907 (Fed. Cir. 2021).

Patent Owner's argument that the claim language, "[a] transceiver . . . configured to output . . . RFID transponder [signals or data]," only makes sense "if the transceiver is not itself an RFID transponder" (Sur-Reply 10) is not persuasive. Examination of the *complete* version of the passage that Patent Owner only paraphrases — "[a] transceiver configured *to output voice call signals in the first state and* to output RFID transponder signals *in the second state*" — shows that the transceiver is capable of both voice call and RFID functions, and thus there is no inconsistency in allowing the RFID function to be performed by RFID transponder circuitry incorporated into the transceiver.

Moreover, the prosecution history of the parent '984 patent is not helpful to Patent Owner's position. Patent Owner relies on the fact that, when Zalewski was first cited against the then pending claims, Patent Owner argued that the embedded transponder used in Zalewski "is not a component that **emulates** an output by an active RFID transponder, being itself an RFID transponder." Ex. 1008, 277. But at that stage of the prosecution, the claims ***specifically recited "emulation."*** Ex. 1008, 269 (*e.g.*, pending claim 1: "output a first data, said output ***emulating*** an output of the first data by an active RFID transponder" (emphasis added)). In any event, the Examiner was ***not persuaded*** by Patent Owner's argument that an RFID transponder cannot emulate itself:

> Applicant submits that the prior art fails to teach an emulated RFID signal. However, the Examiner points out that the claim

> does not recite what exactly is considered as an emulated signal.

Ex. 1008, 243.

Subsequently, Patent Owner amended the claims to ***drop*** all references to emulation in the independent claims. Ex. 1008, 188–194.[11] Instead Patent Owner relied on the fact that:

> [T]he device of Zalewski has a traditional radio frequency component for transmitting and receiving voice calls and messages over a radio frequency network, ***and requires a separate transmission/reception component (a transponder) for providing data transfer over short distances***.
>
> . . . . Zalewski **teaches away** from the recitations of amended claim 1 . . . . because Zalewski explicitly requires radio frequency component 19 for voice calls/messages and a separate transmitter/receiver or transponder (22, 110) for data transfer.

Ex. 1008, 197. Patent Owner further distinguished Zalewski because "[t]he plain meaning of the term 'transceiver' as understood by those of ordinary skill is that it is a single component for transmitting and receiving," which

[11] The only then-pending dependent claims that included "emulating" were claims 9 and 29, which had recited "emulating output of the second data by a RFID transponder." Ex. 1008, 190, 193. Patent Owner deleted "emulating" in claim 29 but overlooked doing so for claim 9, providing no explanation for the inconsistent treatment of those claims. *Id.* Claim 9 ultimately issued in that original form for the parent '984 patent. That claim was then carried over to the prosecution of the '974 patent as application claim 9, then renumbered as claim 66, and ultimately issued as claim 6, still with the vestigial inclusion of "emulated." Ex. 1002, 26, 100, 137. Notwithstanding Patent Owner's arguments based on the appearance of "emulating" in '974 claim 6, we adhere to our conclusion that emulation does not rule out the use of physical RFID transponder circuitry in the transceiver. *See* PO Resp. 23.

would rule out Zalewski's use of an RFID transponder embedded in a removable cover for a phone. *Id.* at 135.

Similarly, in distinguishing the Cooper reference (discussed above in connection with the construction of "voice call signals"), Patent Owner argued:

> The term "transceiver," however, is well understood by those of ordinary skill in the art. One of ordinary skill in the art would not reasonably interpret a "transceiver" so broadly as . . . to be read on by two separate transmitters, as Cooper teaches.

Ex. 1008, 40. After these disavowals of coverage, ultimately the Examiner allowed the claims of the '984 patent, parent to the '974 patent, over Zalewski and Cooper. *Id.* at 18.

We conclude from this prosecution history that the claims do not cover devices that include a separate RFID transponder that is not incorporated into a mobile communications device, such as is done in Zalewski or Cooper. But that record provides no basis for excluding from coverage a mobile communications device that incorporates RFID transponder circuitry into a transceiver in order to switch between outputting voice call signals in one state and outputting RFID transponder signals in another state.

D. Alleged Obviousness of Claims 1–3, 5–9, 11–13, and 16–19 over Willgert and Mooney

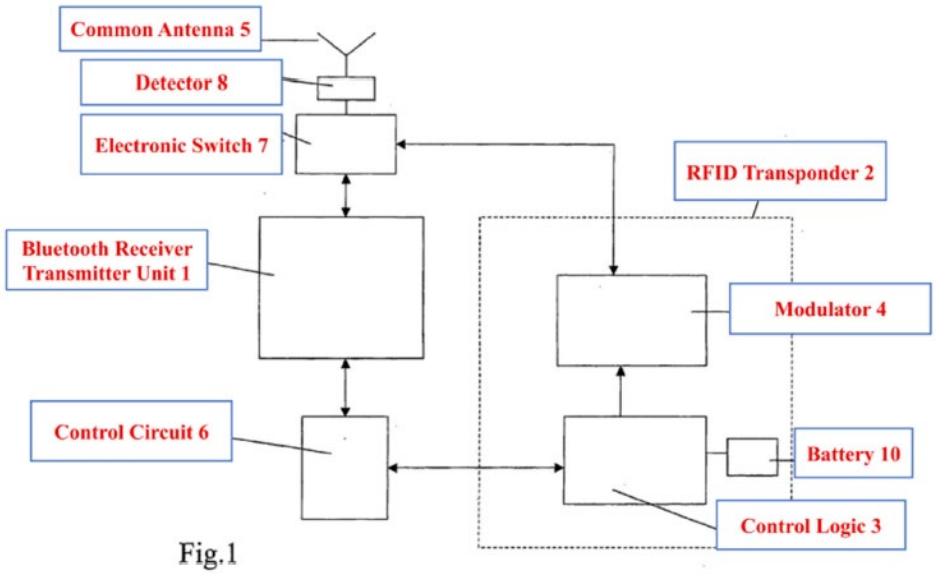
Petitioner contends that claims 1–3, 5–9, 11–13, and 16–19 would have been obvious over the combination of Willgert and Mooney. Pet. 10–60.[12]

1. Willgert

Willgert, titled "Communications Unit," is directed to identifying objects or persons using an RFID transponder. Ex. 1004, code (57). The transponder is integrated with a Bluetooth receiver/transmitter unit, enabling the sharing of common components. *Id.* This integration alleviates the "troublesome [problem] for a user to carry two systems on his/her person," and "significantly lowers the costs and affords simpler handling." *Id.* ¶¶ 8–9.

[12] Petitioner alternatively contends that claims 1, 3, 5–9, and 11 would have been obvious over Willgert alone. Pet. 60–67. This challenge is premised on Petitioner's allegation that, in the District Court case, Patent Owner broadly construed "transceiver" as "encompassing circuitry of different components within a mobile device that *collectively* enable transmission/reception functionality of the mobile device." *Id.* at 60–62, 66 (citing Ex. 1050, 25–26; Ex. 1052, 8; Ex. 1053, 6, 13; Ex. 1055, 65:13–23, 134:5–13; Ex. 1003 ¶¶ 182–183). However, Patent Owner argues that Petitoner mischaracterizes Patent Owner's claim constructions in the District Court. PO Resp. 25. Moreover, Petitioner's alternative construction is inconsistent with positions that Patent Owner took during the prosecution history of the parent '984 patent where, as discussed above, Patent Owner required the term "transceiver" as understood by those of ordinary skill to be a single component for transmitting and receiving. *E.g.*, Ex. 1008, 40, 92, 94, 135, 197. We agree with this prosecution construction, and so do not consider Petitioner's alternative ground for challenging claims 1, 3, 5–9, and 11.

Figure 1, with Petitioner's annotations, is reproduced below.



Pet. 11. Figure 1 is a block diagram of a communications unit including Bluetooth receiver/transmitter unit 1 and RFID transponder 2. Ex. 1004 ¶ 14. RFID transponder 2 includes control logic 3 and associated memory and modulator 4, and in response to receipt of a query signal from an external communicator, reflects the received signal while modulating the signal with a pulse train to provide the communicator with an identity associated with the RFID. *Id.* ¶ 17. Receiver/transmitter unit 1 and RFID transponder 2 share the use of antenna 5 and control circuit 6, and control logic 3 may be included in the function of control circuit 6. *Id.* ¶ 19. Switch 7 routes a signal received by antenna 5 to Bluetooth receiver/transmitter 1 or to RFID transponder 2, controlled by detector 8, which detects to which component the signal is directed. *Id.* ¶ 21.

In one embodiment, the Bluetooth receiver/transmitter and RFID transponder can be integrated into a mobile telephone. Ex. 1004 ¶¶ 30, 32. This integrated embodiment can be constructed so that the transponder functions when the mobile telephone is switched-off, so that the user can

still be identified *via* RFID without carrying a separate transponder. *Id.* ¶ 31.

2. Mooney

Mooney, titled "Smart Bluetooth Interface Gateway To Mate A Non-Bluetooth Wireless Device With A Bluetooth Headset," is directed to allowing a Bluetooth headset to establish an audio connection and communicate with a conventional wireless phone that does not have Bluetooth installed. Ex. 1005, code (57). This is achieved by attaching a Bluetooth interface gateway device to the phone through the analog audio jack of the phone. *Id.* Figure 1 is reproduced below.

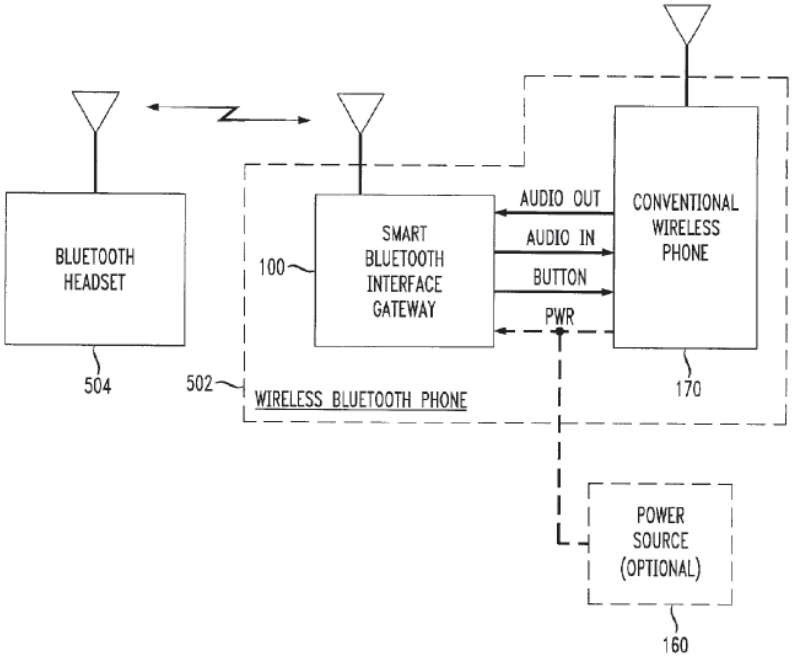
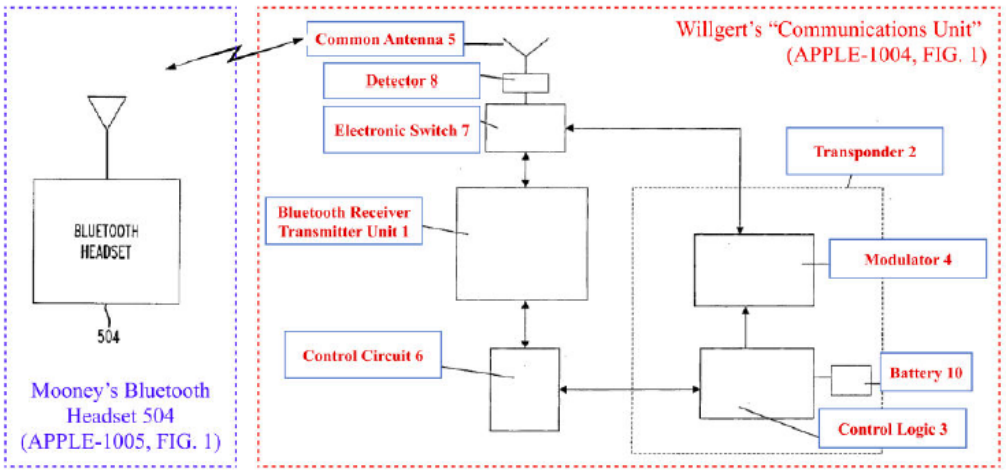


Figure 1 shows Bluetooth headset 504 paired with wireless Bluetooth phone 502 made up of conventional wireless phone 170 connected to smart Bluetooth interface 100 via the audio out, audio in, and button indicator connectors on the wireless phone. Ex. 1005 ¶¶ 31, 38–40. During phone activity, Bluetooth headset 504 can hear voice and/or tones (*e.g.*, from

key presses) generated from wireless phone 170. *Id.* ¶ 48.

3. The Combination of Willgert and Mooney

Petitioner argues that a person of ordinary skill would have been motivated to use the Bluetooth headset of Mooney with the Bluetooth transceiver of the Willgert communications unit included in a mobile telephone designed for Bluetooth communication. Pet. 14–16. This combination would enable a user of the telephone to conveniently receive and respond to voice calls through use of the wireless headset. Ex. 1004 ¶¶ 30–32; Ex. 1005 ¶ 39. Petitioner provides a composite of Figure 1 of Willgert and Figure 1 of Mooney to illustrate this combination, reproduced below.



Willgert-Mooney

This figure shows the Mooney Bluetooth headset on the left communicating via the Bluetooth wireless standard with the Willgert communications unit on the right. Pet. 16.

Petitioner argues that this combination would have been motivated by the fact that Willgert teaches that integrating its communications unit into a mobile telephone designed for Bluetooth communication was a "highly

user-friendly application," and that it was well known practice to use a Bluetooth headset wirelessly communicating with the phone to enable hands-free phone calls, as specifically taught by Mooney. Pet. 14–17 (citing Ex. 1004 ¶¶ 8, 30–32; Ex. 1005, Fig. 3, ¶¶ 7, 39, 46–48; Ex. 1021; Ex. 1003 ¶¶ 72–76). Petitioner further argues that Bluetooth headsets were widely available, that incorporating the headset involved known methods yielding predictable results, and that one of ordinary skill would have reasonably expected to succeed in combining the teachings of Willgert and Mooney. *Id.* at 17–19 (citing Ex. 1004 ¶ 10; Ex. 1005, ¶ 8; Ex. 1017, 1, 3; Ex. 1021, 2; Ex. 1003 ¶¶ 77–79).

Patent Owner does not specifically address the issue of motivation to combine Willgert and Mooney. *See generally* PO Resp. We find, based on the record, that Petitioner has proved by a preponderance of the evidence that a person of ordinary skill in the art would have been motivated to combine Willgert and Mooney as proffered by Petitioner with a reasonable expectation of success.

4. Independent Claims 1, 8, and 12

a) Petitioner's Arguments Challenging Independent Claims 1, 8, and 12

For the preamble of independent method claim 1, Petitioner generally relies on the Willgert/Mooney combination of a Bluetooth enabled mobile telephone in wireless communication with a Bluetooth headset, which includes the ability to switch between Bluetooth transmission handling the voice calls of the mobile telephone and RFID transmission. Pet. 19–21

(citing Ex. 1004, Abstr., ¶¶ 17–18, 20, 22–24, 30, 32; Ex. 1003 ¶¶ 98–102).[13]

For claim requirement 1.1 of receiving an instruction to transmit an RFID,[14] Petitioner relies on the disclosure in Willgert of the ability to receive a query signal from an external RFID communicator, and in response the Willgert RFID transponder transmits an RFID. Pet. 21–23 (citing Ex. 1004 ¶¶ 4–5, 17, 21–23; Ex. 1018; Ex. 1003 ¶¶ 103–107). Petitioner's expert opines that a person of ordinary skill in the art would have understood and found obvious that the instruction recited in claim requirement 1.1 encompasses the query/transponder signal of Willgert-Mooney under the plain meaning of the term "instruction." Ex. 1003 ¶ 104.

In its Reply Brief, Petitioner addresses Patent Owner's claim construction arguments that would require RFID transponder signals to be emulated by a mobile communications device without the use of a physical RFID transponder, repeating its responsive claim construction arguments summarized above. Reply 23–25 (citing Ex. 1003 ¶ 123; Ex. 1063 ¶¶ 43–46). Partitioner maintains its position that there is no reason why the RFID transponder circuitry disclosed in Willgert cannot transmit RFID signals as claimed.[15] *Id.*

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[13] We make no determination as to whether or not the preamble of claim 1 (or of claims 8 or 12) is limiting.

[14] For economy of presentation, we refer to the portions of claim 1 identified by bracketed letters at Section II.D above, and paraphrase the referenced claim requirement, although the complete language of each claim requirement is the subject of our analysis.

[15] For the same reasons, Petitioner refutes Patent Owner's arguments that the switching and selection requirements of the independent claims are not met

For claim requirement 1.2 of switching the mobile communications device from a voice call signal state to an RFID state, Petitioner relies on the Willgert/Mooney combination's ability to switch, in response to receiving a signal from an external RFID communicator, from communicating a voice call signal between the Bluetooth transmitter and the Bluetooth headset, to transmitting an RFID from the RFID transponder. Pet. 23–30 (citing Ex. 1004 ¶¶ 2, 5, 10, 14–25, 28, 30; Ex. 1005, Fig. 3, ¶ 48; Ex. 1003 ¶¶ 49–56, 108–122).

Particularly regarding the voice call signal aspect of claim requirement 1.2, Petitioner relies on the capability of the combination for "Bluetooth voice communication between a telephone (***voice call communication***) and a Bluetooth headset." Pet. 19 (citing Ex. 1003 ¶ 99), *see also id.* at 24–25 (citing Ex. 1004 ¶¶ 22–24, 30; Ex. 1005 ¶ 48; Ex. 1003 ¶¶ 55, 110–111). Petitioner specifically relies on the "output by Bluetooth transmitter/receiver 1" of Willgert communicating with the headset of Mooney so that:

> [T]he Bluetooth receiver/transmitter 1 creates a "transmitter signal" (e.g., relating to a Bluetooth voice communication), which is then "sent to the antenna" and ultimately the Bluetooth headset to allow a user to participate in a voice call through the headset.

Pet. 20–21 (citing Ex. 1004 ¶¶ 20, 22, 24; Ex. 1003 ¶¶ 99–102). Petitioner points out that "the Bluetooth voice communication would have enabled the Bluetooth headset to 'hear voice and/or tones' generated from the telephone"

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by the Willgert/Mooney combination (*see* PO Resp. 34–38), which arguments in substance repeat Patent Owner's arguments regarding the "RFID signal" requirements. Reply 23–25.

during a telephone call. *Id.* at 25 (citing Ex. 1004 ¶¶ 24, 30; Ex. 1005 ¶ 48; Ex. 1003 ¶ 114).

In its Reply Brief, Petitioner further addresses the voice call signal requirements of the claim, arguing that the Bluetooth signal conveying a voice call satisfies the plain meaning of the term. Reply 25–27 (citing Ex. 1003 ¶¶ 74, 114, 187; Ex. 1063 ¶¶ 49, 47–50).

For claim requirement 1.3 of outputting the RFID, Petitioner relies on the disclosure in Willgert of transmitting an RFID from the RFID transponder to an RFID communicator. Pet. 30–31 (citing Ex. 1004 ¶¶ 5, 17, 22–24, 30; Ex. 1003 ¶ 123).

Independent method claim 8 has requirements commensurate with method claim 1 and additionally requires "monitoring . . . for proximal presence of a proximal RFID reader." Ex. 1001, 10:4–20. Petitioner's challenge to claim 8 tracks that of claim 1 and further relies on disclosures in Willgert of the ability of the RFID transponder to respond to receipt of a signal provided by an RFID communicator when the RFID transponder is in sufficient proximity to the communicator — "at a given short distance, for example of five meters." Pet. 36–38, 42–48 (citing Ex. 1004 ¶¶ 4–7, 15, 17, 21–25, 28, 30; Ex. 1005, Fig. 3, ¶¶ 4, 48; Ex. 1011 ¶ 6; Ex. 1003 ¶¶ 134–139, 146–155).

Independent claim 12 is a device claim counterpart to method claims 1 and 8 that additionally requires a transmitter with signal processing sections, a storage medium storing data and instructions, and a processor, which components implement functionality commensurate with the independent method claims. Ex. 1001, 10:33–54. Petitioner's challenge to claim 12 tracks that of claims 1 and 8, and further relies on disclosures in

Willgert of the communications unit that includes Bluetooth receiver/ transmitter unit 1, RFID transponder 2, control logic 3 and associated memory, modulator 4, antenna 5, control circuit 6, switch 7, and detector 8, and the Bluetooth headset of Mooney. Pet. 49–59 (citing Ex. 1004, Abstr., ¶¶ 4–7, 15, 17–25, 28, 30, 32; Ex. 1005, Fig. 3, ¶ 48; Ex. 1011 ¶ 6; Ex. 1012, Abstr., Fig. 9, 12:14–20, 13:1–36; Ex. 1003 ¶¶ 157–178). Petitioner further argues that it would have been obvious that Bluetooth transmitter 1 and RFID transponder 2 of the communications unit would have been configured to transmit signals of different frequency ranges in accord with the requirements of claim 12. *Id.* at 50–51 (citing Ex. 1013, 20–23; Ex. 1014; Ex. 1015; Ex. 1003 ¶ 159).

b) Patent Owner's Responses Regarding Independent Claims 1, 8, and 12

Patent Owner specifically responds to Petitioner's arguments regarding the "voice call signal" and "RFID transponder signal" requirements of independent claims 1, 8 and 12, which are discussed below. Patent Owner does not specifically respond regarding the remaining requirements of the independent claims. *See generally* PO Resp.

(1) "Voice Call Signals"

Patent Owner argues that the Willgert-Mooney combination fails to teach or suggest the voice call signals required by the claims. PO Resp. 28–31. In particular, Patent Owner argues that the Willgert-Mooney Bluetooth signals that Petitioner relies on are "not carried over the right type of network," because, as discussed in Section III.C.2.a) above, according to Patent Owner, the voice call signals must be transmitted over a network of a wireless network service provider. *Id.* at 28 (citing Ex. 2004 ¶¶ 58–59).

In addition, Patent Owner argues that the Bluetooth communication signals are not transmitted to another user of another communication device which is the "primary communication function of the [communications] device." *Id.* at 29 (citing Ex. 2004 ¶¶ 61–63). Rather, argues Patent Owner, the Bluetooth signals enable a single user to establish an audio connection between the user's device and the user's own headset. *Id.* Patent Owner asserts that Petitioner's statement referring to "processing all wireless signals (RFID, Bluetooth, voice calls)" is an admission that Bluetooth signals are distinct from voice call signals. *Id.* (citing Pet. 63).

Patent Owner criticizes Petitioner's argument that Bluetooth signals in the Willgert-Mooney combination allow the user to hear "voice and/or tones" from the phone, because that would encompass listening to a pre-recorded voicemail messages. PO Resp. 30. Patent Owner also cites the above-discussed prosecution of the '984 parent patent, during which, according to Patent Owner, the cited Cooper reference was distinguished by arguing that the disclosed Bluetooth headset signals did not teach the required "output voice call signals" limitations of the claims. *Id.* at 30–31 (citing Ex. 1008, 38–39, 65–70; Ex. 2004 ¶ 64).

(2) "RFID Transponder Signals"

Applying its construction of RFID transponder signals as "RFID signals emulated by a mobile communications device without the use of a physical RFID transponder," Patent Owner argues that the Willgert-Mooney combination fails to teach or suggest emulated RFID signals, given the use of an actual physical RFID transponder in the combination. PO Resp. 31–34

(citing Ex. 2004 ¶¶ 66, 69); Sur-Reply 20.[16] Patent Owner disputes Petitioner's reliance on Holloway for its "functional emulation" arguments (*e.g.*, Reply 12), given that Holloway is not relied on for Petitioner's challenges to the independent claims. Sur-Reply 20.

Patent Owner also points to the above-discussed prosecution of the '984 parent, during which the cited Zalewski reference was distinguished by arguing that it did not disclose an RFID signal emulated by a mobile device because it relied on a physical RFID transponder outputting its signal. PO Resp. 33–34 (citing Ex. 1008, 236, 277; Ex. 2004 ¶ 72).

c) Analysis of Petitioner's Challenges to Independent Claims 1, 8, and 12

We disagree with Patent Owner's argument that the Willgert/Mooney combination does not teach or suggest the voice call signal requirements of the claims. As stated in the '974 patent, the voice call signals relate to "the primary function of [the mobile communications device], i.e. to facilitate a user in communicating with another user of another communication device." Ex. 1001, 3:53–55. The proffered combination of wirelessly connecting a Bluetooth headset to the Bluetooth receiver/transmitter of Willgert's communications unit includes the fact that the Willgert communications unit is integrated into a mobile telephone. Ex. 1004 ¶¶ 30, 32. Thus, when the telephone is being used for its "primary purpose" of communicating with another user, the same voice call signal involved in that communication is

[16] Based on its arguments regarding the failure of the Willgert-Mooney combination to teach or suggest emulated RFID signals, Patent Owner also argues that the claims 1 and 12 "switching" and "selecting" requirements, and the requirements to output RFID transponder signals, are not met. PO Resp. 35–38 (citing Ex. 2004 ¶¶ 78, 82); Sur-Reply 21.

also being transmitted from the telephone to the Bluetooth headset. We see no reason why the claimed "voice call signals" must be construed to exclude such signals. As discussed above in Section III.C.2.d), we specifically decline to adopt Patent Owner's argument that a voice call signal can only be transmitted over a network of a wireless network service provider. Anyone using the Willgert/Mooney combination to place and engage in a telephone call, let alone one of ordinary skill in the art, would reasonably consider what they were receiving on the Bluetooth headset to be a "voice call signal."

We also disagree with Patent Owner's assertion that the Willgert/Mooney combination does not transmit RFID transponder data. As discussed above in Section III.C.3.d), the claims do not rule out the use of physical transponder circuitry to generate the RFID transponder data or signals. Just as disclosed in the '974 patent, Willgert's RFID transponder 2 shares "substantial portions of the hardware . . . employed to provide a RFID" with the Bluetooth transmission hardware, thus "advantageously leverage on existing elements of mobile communication device." *Compare* Ex. 1004 ¶ 15 ("transponder 2 is integrated with the receiver/transmitter unit 1 . . to enable components associated with the receiver/transmitter unit to be used also for operation of the transponder 2") *and* ¶ 19 (Bluetooth and RFID transponder share antenna, switch and control logic), *with* Ex. 1001, Figure 1, 3:48–61 (intersection of mobile communication element 104 and RFID element to "advantageously leverage on existing elements"). Also, the Willgert/Mooney combination serves the functional emulation purpose of the '974 patent by solving the "troublesome [problem] for a user to carry two systems on his/her person." Ex. 1004 ¶¶ 8–9. In particular, when the

"Bluetooth and transponder are both integrated in a mobile telephone," the user can use one device for voice call communications and RFID identification, for example. *Id.* ¶ 32.

As summarized above, Petitioner provides detailed explanations as to how the combination of Willgert and Mooney allegedly renders obvious independent claims 1, 8 and 14. Other than the above arguments regarding the "voice call signal" and "RFID transponder signal" requirements of the independent claims in Patent Owner's response, which we do not agree with, Patent Owner does not specifically respond to Petitioner's arguments regarding the remaining requirements of the independent claims. Accordingly, based on our analysis set forth above, having considered and weighed the entirety of the evidence, we determine that Petitioner has proved by a preponderance of the evidence that claims 1, 8 and 12 are unpatentable under 35 U.S.C. § 103(a) over the combination of Willgert and Mooney.

5. Dependent Claims 2, 3, 5–7, 9, 11, 13, and 16–19

Claim 2 adds to claim 1 the requirement that the claim 1 transceiver comprises signal processing units for the voice call and RFID signals, and that the claim 1 switching includes coupling the RFID signal processing unit to the transmission path. Ex. 1001, 9:39–44. Claim 3 adds to claim 1, and claim 13 adds to claim 12, the requirement that the RFID transponder data comprises a security key or an identifier. *Id.* at 9:45–47, 10:55–57. Claim 5 adds to claim 1, claim 11 adds to claim 8, and claims 16 and 17 add to claim 12, the requirement of provisioning a compatible signaling attribute for RFID transponder data output. *Id.* at 9:52–57, 10:27–32, 10:65–67, 11:1–5. Claim 6 adds to claim 1 the requirement of outputting RFID data in response

to proximal presence of an RFID reader. *Id.* at 9:58–67. Claim 7 adds to claim 6, claim 9 adds to claim 8, and claim 18 adds to claim 12, the requirement of monitoring a probing radio frequency signal of the RFID reader. *Id.* at 10:1–3, 10:21–24, 11:6–8. Claim 19 adds to claim 12 the requirement that the mobile communication device is a wireless mobile phone or a personal digital assistant. *Id.* at 12:1–4.

Petitioner provides detailed explanations, supported by Petitioner's expert's testimony, as to how the combination of Willgert and Mooney allegedly renders obvious these dependent claims, relying on disclosures in Willgert of pertinent components of the communications unit, the nature of the transmitted RFID signals, including as an identifier, the ability to write data into the transponder memory, the ability to monitor the presence of, and respond to, RFID readers, and the disclosure of the Willgert communications unit incorporated in a mobile telephone. Pet. 31–42, 48, 59–60 (citing Ex. 1003 ¶¶ 124–145, 156, 180–181).

In addition to the above arguments regarding the "voice call signal" and "RFID transponder signal" requirements of the independent claims in Patent Owner's response, which we do not agree with, Patent Owner also specifically argues that switching and selection requirements of various dependent claims are not met by the Willgert/Mooney combination. PO Resp. 34–38. However, as Petitioner points out, these arguments in substance repeat Patent Owner's arguments regarding the "RFID transponder signal" requirements of the independent claims. *See* Reply 23–25. Patent Owner does not otherwise specifically respond to Petitioner's arguments regarding the remaining requirements of dependent claims 2, 3, 5–7, 9, 11, 13, and 16–19. *See generally* PO Resp.

Accordingly, based on our analysis set forth above, having considered and weighed the entirety of the evidence, we determine that Petitioner has proved by a preponderance of the evidence that claims 2, 3, 5–7, 9, 11, 13, and 16–19 are unpatentable under 35 U.S.C. § 103(a) over the combination of Willgert and Mooney.

E. Alleged Obviousness of Claims 3–6, 10, 11, and 13–17 over Willgert, Mooney, Holloway, and Pitroda

Petitioner contends that claims 3–6, 10, 11, and 13–17 would have been obvious over the combination of Willgert, Mooney, Holloway, and Pitroda. Pet. 67–87.

Holloway discloses a mobile telephone that includes an RFID transmitter for checking the identity of a user in connection with RFID smart card transactions. Ex. 1006, Abstr. It addresses the limitations of traditional RFID smart cards that require a user to carry a large number of cards, using a memory for separately storing information for different RFID smart cards. Ex. 1003 ¶ 66; Ex. 1006, Abstr., 3:28–30; *see also* Pet. 67–70 (citing Ex. 1003 ¶¶ 66–70).

Pitroda discloses hand-held computers (for example) with processor and storage that includes credentials for clients to access multiple vendor transactions, such as communicating with point of sale terminals. Ex. 1007, Abstr.; Pet. 70–71 (citing Ex. 1003 ¶ 71).

Petitioner argues that a person of ordinary skill would have been motivated to add the capabilities of Holloway and Pitroda regarding multiple RFID transmissions and user transaction credentials, such as providing selection of multiple smart cards, to the Willgert/Mooney combination to improve user convenience using a telephone with improved RFID signaling

capabilities. Pet. 71–74 (citing Ex. 1003 ¶¶ 80–86). Petitioner submits that the combination would have utilized hardware elements described in Willgert and Holloway, while leveraging the software enhancements described in Pitroda, such as employing multiple different smart cards through the Willgert transponder using Pitroda's disclosure of user selection. *Id.* at 74 (citing Ex. 1003 ¶¶ 87–94). Petitioner's expert testifies that one of ordinary skill would have had a reasonable expectation of success in combining the teachings of the references, using well-known techniques. *Id.* at 74–76 (citing Ex. 1003 ¶¶ 95–97).

Patent Owner does not specifically address the issue of motivation to combine Willgert, Mooney, Holloway, and Pitroda. *See generally* PO Resp. We find, based on the record, that Petitioner has proved by a preponderance of the evidence that a person of ordinary skill in the art would have been motivated to combine these references as proffered by Petitioner with a reasonable expectation of success.

Claims 3 and 13 add to claims 1 and 12, respectively, the requirement that the RFID transponder data comprises a security key or an identifier; claim 10 adds to claim 8 the requirement that the RFID transponder data comprises a security key; and claim 14 adds to claim 13 the requirement that the RFID transponder data comprises a security key, and said security key comprises a door key. Ex. 1001, 9:45–47, 10:25–26, 10:55–60. In addition to its reliance on the Willgert/Mooney combination alone, discussed above in Section III.D.5, Petitioner relies on the disclosures in Holloway and Pitroda of the use of RFID technology and user credentials for identifiers and security keys, and argues that it would have been obvious that one such

security key would be a door key. Pet. 76–77, 84–85, 87 (citing Ex. 1003 ¶¶ 196–199, 214–215, 219).

Claims 4 and 15 add to claims 1 and 12, respectively, the requirement of selection of a plurality of RFID transponder data. Ex. 1001, 9:48–51, 10:61–64. Petitioner relies on the disclosures in Holloway and Pitroda of the use of multiple RFID and other user-credential-based smart cards for identification and security keys. Pet. 77–78, 85–86 (citing Ex. 1003 ¶¶ 200–202, 216).

Claims 5, 11, 16, and 17 add to their respective independent claims the requirement of provisioning a compatible signaling attribute for RFID transponder data output. Ex. 1001, 9:52–57, 10:27–32, 10:65–67, 11:1–5. In addition to its reliance on the Willgert/Mooney combination alone, discussed above in Section III.D.5, Petitioner relies on the disclosures in Holloway and Pitroda of the ability to write data into the transponder memory to affect attributes associated with subsequent RFID-compatible transmissions. Pet. 78–81, 86–87 (citing Ex. 1003 ¶¶ 203–207, 217–219).

Claim 6 adds to claim 1 the requirement of outputting RFID data in response to proximal presence of an RFID reader. Ex. 1001, 9:58–67. In addition to its reliance on the Willgert/Mooney combination alone, discussed above in Section III.D.5, Petitioner relies on disclosures in Holloway and Pitroda of the use of multiple RFID transmissions resulting from successive user interactions with RFID readers occurring at different times. Pet. 82–84 (citing Ex. 1003 ¶¶ 210–213).

Patent Owner responds by arguing that the Willgert, Mooney, Holloway, Pitroda combination still relies on physical RFID transponders and therefore fails to provide emulated RFID signals, and therefore also does

not satisfy the selecting and switching requirements of the claims. PO Resp. 41–50. Patent Owner also argues that the combination fails to teach or suggest the required voice call signals. *Id.* at 51. These arguments are unpersuasive for the same reasons as discussed above.

Accordingly, based on our analysis set forth above, having considered and weighed the entirety of the evidence, we determine that Petitioner has proved by a preponderance of the evidence that claims 3–6, 10, 11, and 13–17 are unpatentable under 35 U.S.C. § 103(a) over the combination of Willgert, Mooney, Holloway, and Pitroda.

IV. CONCLUSION[17]

For the foregoing reasons, we are persuaded that Petitioner establishes by a preponderance of the evidence that claims 1–19 of the '974 patent have been shown to be unpatentable.

In summary:

Claims	35 U.S.C. §	References/ Basis	Claims Shown Unpatentable	Claims Not Shown Unpatentable
1–3, 5–9, 11–13, 16–19	103	Willgert, Mooney	1–3, 5–9, 11–13, 16–19	
1, 3, 5–9, 11	103	Willgert[18]		
3–6, 10, 11, 13–17	103	Willgert, Mooney, Holloway, Pitroda	3–6, 10, 11, 13–17	
Overall Outcome			1–19	

V.

[17] Should Patent Owner wish to pursue amendment of the challenged claims in a reissue or reexamination proceeding subsequent to the issuance of this decision, we draw Patent Owner's attention to the April 2019 *Notice Regarding Options for Amendments by Patent Owner Through Reissue or Reexamination During a Pending AIA Trial Proceeding. See* 84 Fed. Reg. 16,654 (Apr. 22, 2019). If Patent Owner chooses to file a reissue application or a request for reexamination of the challenged patent, we remind Patent Owner of its continuing obligation to notify the Board of any such related matters in updated mandatory notices. *See* 37 C.F.R. §§ 42.8(a)(3), (b)(2).

[18] We do not reach this challenge to claims 1, 3, 5–9, and 11 because it is based on a claim construction that we do not adopt. *See* page 28, footnote 12.

VI. ORDER

In consideration of the foregoing, it is hereby

ORDERED that claims 1–19 of U.S. Patent No. 8,381,974 B2 have been shown to be unpatentable under 35 U.S.C. § 103; and

FURTHER ORDERED that, because this is a final written decision, parties to this proceeding seeking judicial review of our Decision must comply with the notice and service requirements of 37 C.F.R. § 90.2.

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