

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re Patent of: Peter Zatloukal, et al. Attorney Docket No.:50095-0182IP1
U.S. Patent No.: 9,405,947
Issue Date: August 2, 2016
Appl. Serial No.: 13/750,970
Filing Date: January 25, 2013
Title: EMULATED RADIO FREQUENCY IDENTIFICATION

SUPPLEMENTAL DECLARATION OF DR. ZHI DING

I hereby declare that all statements made of my own knowledge are true and that all statements made on information and belief are believed to be true. I further declare that these statements were made with the knowledge that willful false statements and the like so made are punishable by fine or imprisonment, or both, under Section 1001 of the Title 18 of the United States Code.

Dated: 8/27/2025

By: _____

Zhi Ding



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Ding

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TABLE OF CONTENTS

I.	INTRODUCTION	3
II.	BACKGROUND AND QUALIFICATIONS	4
III.	INFORMATION CONSIDERED	4
IV.	LEVEL OF ORDINARY SKILL IN THE ART	7
V.	RELEVANT LEGAL STANDARDS	7
VI.	SUMMARY OF OPINIONS	7
VII.	OVERVIEW OF THE '947 PATENT	8
	A. Specification	8
	B. Claims	8
	C. Prosecution History	8
VIII.	PRIOR ART ANALYSIS	8
	A. Claim Interpretation	8
	1. <i>Plain And Ordinary Meaning</i>	10
	2. <i>Dr. Shamos' Interpretations</i>	15
	B. Application Of The Prior Art To The "RFID" Limitations, The "Operational Space" Limitations, The "Determining" Limitations, And The "Instructions" Limitations	25
	1. <i>"RFID" Limitations</i>	25
	2. <i>"Selecting" Limitations</i>	28
	3. <i>"Determining" and "Operational Space" Limitations</i>	28
	4. <i>"Instructions" Limitations</i>	29
	C. Application Of The Prior Art To The "Voice Call Signal" Limitations	29

I, Zhi Ding, declare that:

I. INTRODUCTION

1. I have been retained on behalf of Apple Inc. (“Apple”), as an independent expert consultant in this inter partes review (“IPR”) proceeding before the Patent Trial and Appeal Board (“PTAB”) of the United States Patent and Trademark Office (“USPTO”). I understand that the proceeding number of this IPR proceeding is IPR2024-01363.

2. I have been asked by Apple’s counsel (“Counsel”) to consider whether certain references describe or make obvious features recited in the claims of U.S. Patent No 9,405,947 (“the ’947 patent”) (APPLE-1001). My opinions and the bases for my opinions are set forth below. My opinions are based on my education, my knowledge and experience in the relevant fields of technology, and my review of the materials considered in preparing this document.

3. On August 28, 2024, I provided an initial Declaration in the IPR2024-01363 proceeding (“Declaration”). I understand that the Declaration was marked as APPLE-1003. The Declaration contained my opinions and the bases for them. Since submitting this supplemental declaration (“Supplemental Declaration”), I have considered the Declaration of Dr. Michael Shamos (“Shamos Declaration”) (EX-2004). My opinions from my previous Declaration have not changed.

II. BACKGROUND AND QUALIFICATIONS

4. My background and qualifications are set forth in the Declaration. I incorporate that section in this Supplemental Declaration by reference.

III. INFORMATION CONSIDERED

5. In preparing this Supplemental Declaration, I have considered documentary materials referenced in the table below. In addition, my opinions are further based on my education, training, experience, and knowledge in the relevant fields.

Document Identifier	Description
APPLE-1001	U.S. Patent No. 9,405,947 to Zatloukal, et al. (“the ’947 Patent”)
APPLE-1002	Excerpts from the Prosecution History of the ’947 Patent (“the Prosecution History”)
APPLE-1004	U.S. Patent Publication No. 2005/0083177 (“Willgert”)
APPLE-1005	U.S. Patent Publication No. 2003/0045235 (“Mooney”)
APPLE-1006	International Pub. No. WO 02/49322 (“Holloway”)
APPLE-1007	U.S. Patent No. 7,308,426 (“Pitroda”)
APPLE-1008	Excerpts from the Prosecution History of U.S. Patent No. 8,127,984 (“the ’984 Patent Prosecution History”)
APPLE-1009	Excerpts from the Prosecution History of U.S. Patent No.

Supplemental Declaration of Zhi Ding
APPLE-1063

	8,381,974 (“the ’974 Patent Prosecution History”)
APPLE-1010	U.S. Patent No. 5,943,624 (“Fox”)
APPLE-1011	U.S. Patent Publication No. 2003/0187787 (“Freund”)
APPLE-1012	International Pub. No. WO 98/43366 (“Schlang”)
APPLE-1013	Hallberg & Nilsson, “Positioning with Bluetooth, irDA and RFID,” Master’s Thesis, 2002:125 (Jan. 2002) (“Hallberg”)
APPLE-1014	Takikawa, Kumiko, et al., “RF circuits technique of dual-band transceiver IC for GSM and DCS1800 applications.” Proceedings of the 25th European Solid-State Circuits Conference. IEEE, 1999 (“Takikawa”)
APPLE-1015	Razavi, Behzad, “A 900-MHz/1.8-GHz CMOS Transmitter for Dual Band Applications,” IEEE Journal of Solid-State Circuits, Vol. 34, No. 5, May 1999 (“Razavi”)
APPLE-1016	“Cell Phone Use on the Roads in 2002,” Technical Report DOT HS 809 580, National Highway Traffic Safety Administration (Dec. 2004)
APPLE-1017	Scheiderman, “Bluetooth’s slow dawn,” 2000 IEEE 61-65 (“Scheiderman”)
APPLE-1018	Tapley, Byron D., “Eshbach’s Handbook of Engineering

Supplemental Declaration of Zhi Ding
APPLE-1063

	Fundamentals,” Wiley-Interscience (Edition 4), 1990, IBSN 10: 0471890847 (“Tapley”)
APPLE-1019	Smart Card Alliance, “Contactless Technology for Secure Physical Access: Technology and Standards Choices” (October 2002)
APPLE-1020	U.S. Patent No. 5,748,737 (“Daggar”)
APPLE-1021	Arfwedson & Sneddon, “Ericsson’s Bluetooth modules,” Ericsson Review No. 4, 1999 (“Arfwedson”)
Paper 7	Decision Granting Institution of <i>Inter Partes</i> Review (“Decision”)
APPLE-1065	Newton, Harry, Newton's Telecom Dictionary. 18th Ed., CMP Books, Mar. 2002
APPLE-1066	Finkenzeller, Klaus, <i>RFID Handbook: Fundamentals and Applications in Contactless Smart Cards and Identification</i> , 2nd Ed., John Wiley & Sons, 2003
APPLE-1067	Mississippi Department of Information Technology Services. Telecommunications Coordinator Handbook, July 2015, Mississippi Department of Information Technology Services, available at https://www.its.ms.gov/sites/default/

	files/PublicationsPDFs/2015_TCHandbook.pdf.
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IV. LEVEL OF ORDINARY SKILL IN THE ART

6. I set forth a definition of a person of ordinary skill in the art (“POSITA”) in the Declaration, and I incorporate that definition here by reference.

V. RELEVANT LEGAL STANDARDS

7. I set forth the relevant legal standards in the Declaration, and I incorporate those legal standards here by reference.

VI. SUMMARY OF OPINIONS

8. I have been asked to consider whether the claims of the ’947 patent are anticipated or obvious over certain prior art references. As explained in the Declaration, and in further detail in this Supplemental Declaration, it is my opinion that:

- **Ground 1A:** Based upon my knowledge and experience and my review of the prior art publications in this declaration, I believe that claims 1, 2, 6-9, 14-17, 22, 23, 25, 26, and 30-32 of the ’947 patent are made obvious by Willgert and Mooney
- **Ground 1B:** I believe that claims 1, 2, and 6-8 of the ’947 patent are made obvious by Willgert
- **Ground 2:** Based upon my knowledge and experience and my review of the prior art publications in this declaration, I believe that claims 2-7, 10-14, 17-

24, and 27-31 of the '947 patent are made obvious by Willgert, Mooney, Holloway, and Pitroda

VII. OVERVIEW OF THE '947 PATENT

A. Specification

9. I summarized the '947 patent specification in the Declaration, and I incorporate that summary here by reference.

B. Claims

10. I summarized the '947 patent claims in the Declaration, and I incorporate that summary here by reference.

C. Prosecution History

11. I summarized the '947 patent claims in the Declaration, and I incorporate that summary here by reference.

VIII. PRIOR ART ANALYSIS

12. The Declaration analyzed how prior art combinations involving Willgert, Holloway, Mooney, and Pitroda described the features of the claims of the '947 according to the grounds in §VI. I incorporate that analysis here by reference. In this Supplemental Declaration, I further address statements from Dr. Shamos relating to the prior art discussed in the Declaration.

A. Claim Interpretation

13. As explained in the Declaration, I understand that the words of the claims should be given their plain meaning unless that meaning is inconsistent with

the patent specification or the patent's history of examination before the Patent Office. The words of the claims should also be interpreted as they would have been interpreted by one of ordinary skill at the time of the invention was made (not today). My opinions in this section are based on these understandings.

14. In this Supplemental Declaration, I address interpretations of certain claim terms based on how a POSITA would have understood them under their plain and ordinary meaning. This analysis is based on my review of documents that became part of this proceeding after the Declaration.

15. I understand that a three-judge panel of the Patent Trial and Appeal Board ("Panel") provided discussion and explained the meaning of certain terms in the Decision, including the "RFID Elements"¹ addressed in the Shamos Declaration. I agree with this analysis, and my further analysis regarding this topic is included in Section VIII.A below.

¹ For simplicity, this Declaration references limitations reciting each of the claim elements/terms identified in the POR as requiring construction, including limitations reciting "RFID signal[s]" ("RFID" limitations) and limitations reciting "voice call signal[s]" ("voice call signal" limitations).

16. I also understand that the Panel also the addressed the “voice call signal” term addressed in the Shamos Declaration. I agree with this analysis, and my further analysis on this topic is included in Section VIII.A below.

17. Based on my knowledge and experience in the relevant fields, and my review of the '947 patent specification and its file history, I agree with the Panel's analysis in the Decision. This analysis is also consistent with my opinions in the Declaration and opinions in this Supplemental Declaration.

1. Plain And Ordinary Meaning

18. Based on my knowledge and experience in the relevant fields, and my review of the '947 patent specification and its file history, the claim terms of the '947 patent should be given their plain and ordinary meaning. A POSITA would not have reviewed the claim language, the '947 patent specification, or the relevant file histories² to conclude that the applicant defined any claim term in a way that departs from the plain and ordinary meaning.

² The relevant file histories include the file history of the '947 patent (APPLE-1002), and the file histories of related patents, including that of the '984 patent (APPLE-1008) and the '974 patent (APPLE-1009).

a. “RFID” Limitations³

19. Independent claims 1, 9, 16, and 26 include limitations (“RFID” limitations) that describe outputting data/signals represented by “RFID Elements.” These “RFID Elements” include “RFID signal[s],” “RFID probing signal.” *See* APPLE-1001, Cls. 1, 9, 16, 26. The words included in the “RFID Elements” are “RFID,” “probing” and “signal[s].” None of these words are specifically defined in the claims, specification, or relevant file histories, and there are no statements in each that would suggest the applicant wanted narrower scope. The phrases included in the “RFID Elements” are also not specifically redefined in the claims, specification, or relevant file histories. Without such redefinition and narrowing statements, I understand that the plain and ordinary meaning of these words are to be applied in determining what the “RFID Elements” mean.

20. The plain and ordinary meaning of “signal” includes a potential, for example, voltage or light, “used to convey information” from one point to another.

³ This Supplemental Declaration references limitations reciting each of the claim elements/terms identified by the Shamos Declaration as requiring construction. This includes limitations reciting RFID data/signals (collectively “‘RFID’ limitations”) and limitations reciting “voice call signal[s]” (collectively “‘voice call signal’ limitations”).

APPLE-1065, 3⁴. The plain and ordinary meaning of “RFID” (or “radio frequency identification”) includes a generic term for all technologies that use radio waves to achieve automatic identification of objects and people. When combined, the “RFID Elements” under its plain and ordinary meaning include a potential “used to convey information” using radio waves to achieve automatic identification of objects and people from one point to another. APPLE-1065, 3.

21. The plain meaning understanding discussed above is consistent with the claims, specification, and the relevant file histories. As explained above, none of the words (“RFID,” “probing,” and “signal[s]”) are specifically defined in the claims, specification, or relevant file histories, and there are no statements in each that would suggest the applicant wanted narrower scope.

22. The plain and ordinary meaning of claim elements represents by “RFID Elements” are not limited by the hardware that produces the radio-frequency potential. A POSITA would have understood and found obvious that any applicable transmitter (e.g., inductive LF coil, 13.56 MHz reader/transponder antenna, UHF patch, or active tag’s power amplifier) may be used to generate an RFID signal (under plain meaning) so long as the signal includes an RF waveform that carries the identification data. Thus, under plain meaning and in light of a

⁴ APPLE-1065 uses the PDF pagination.

POSITA's understanding, the "RFID" limitations include signals generated or radiated by any suitable transmitting element, without restricting the technology, architecture, or component implementation used to emit them.

b. "Voice Call Signal" Limitations

23. Claims 1, 9, 16, and 26 include limitations ("voice call signal" limitations) that describe outputting "voice call signal[s]." The words included in this phrase are "voice," "call," and "signal[s]." *See* APPLE-1001, Cls. 1, 9, 16, 26. None of these words are specifically defined in the claims, specification, or relevant file histories, and there are no statements in each that would suggest the applicant wanted narrower scope. The specific phrase "voice call signal[s]" is also not defined in the claims, specification, or relevant file histories. Without such redefinition and narrowing statements, I understand that the plain and ordinary meaning of these words are to be applied in determining what the phrase "voice call signal[s]" means.

24. As explained above, the plain and ordinary meaning of "signal" includes a potential, for example, voltage or light, "used to convey information" from one point to another. APPLE-1065, 3. Additionally, the plain and ordinary meaning of "voice call[s]" includes a "telephone call established for the purpose of

transmitting voice rather than data communications.” APPLE-1067, 40⁵. When combined, the phrase “voice call signal[s]” under its plain meaning includes a potential “used to convey information” relating to a telephone call established for the purpose of transmitting voice rather than data communications. APPLE-1065, 3.

25. The plain and ordinary meaning of the “voice call signal[s]” is not limited to a cellular network (or network elements of the cellular network, such as a base station). During a Bluetooth hands-free call (e.g., via a headset or in-vehicle system), the handset and accessory exchange digitized voice data or signals over the Bluetooth link as part of the call audio path, and that Bluetooth transmission is used to speak and hear during the phone call. Because this Bluetooth transmission is the signal by which participants communicate while engaged in the phone call, a Bluetooth voice communication signal falls within a “voice call signal” under its plain and ordinary meaning.

26. The specification supports the plain meaning understanding of “voice call signal[s]” discussed above. The specification also does not redefine “signal” to be limited to direct communications (e.g., cell phone to cell tower communications). APPLE-1001, 2:40-3:8 (describing “electrical, magnetic, or

⁵ APPLE-1067 uses the PDF pagination.

optical signals capable of being stored, transferred, combined, and otherwise manipulated through electrical and/or optical components of a processor and its subsystems.”). Additionally, the specification states that “[c]ommunication may be voice and/or data, audio, textual and/or visual,” which is ordinary and self-explanatory. *Id.*, 4:11-21; *see also id.*, 7:13-20. These passages do not limit the phrase “voice call signal[s]” to any special protocol, frequency band, or network architecture.

2. Dr. Shamos’ Interpretations

27. I understand that the Shamos Declaration identifies three sets of elements/features that require construction:

Claim Phrase	Patent Owner’s Construction
“RFID signal” (Claims 1, 2, 9, 16, 17, 26, 27)	“RFID transponder signal emulated by a mobile communications device without the use of a physical RFID transponder”

Ex-2004, p. 16

Claim Phrase	Patent Owner’s Construction
“voice call signal[s]” (Claims 1, 9, 16, 26)	“transmit and/or receive signal[s] of a voice call over a network of a wireless network service provider”

Ex-2004, p. 15

Claim Phrase	Patent Owner's Construction
“wireless mobile phone” (Claims 8, 15, 25, 32)	“telephony device 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”

Ex-2004, pp. 13-14

28. I disagree with statements in the Shamos Declaration that the terms identified above need to be interpreted beyond their plain and ordinary meaning. *See* Ex-2004, ¶¶43-54.

a. “RFID” Limitations

29. Based on my review of the documents in this proceeding, a POSITA would not have understood the “RFID” limitations as interpreted in the Shamos Declaration. This is because Dr. Shamos’ interpretation has at least three distinct requirements that are not described in the claims themselves. The first asserts that “[a]ll of the independent Challenged Claims **require** outputting an RFID **transponder** signal” but the claims the independent claims only recite “RFID signal.” EX-2004, ¶52 (emphasis added).

30. The second requirement is that RFID signal/data be “emulated.” None of the independent claims of the ’947 patent use the word “emulated.” Nor

does this word appear in any dependent claim. However, in claim 6 of the '974 patent⁶ and claim 9 of the '984 patent⁷, the act of “emulating” is still performed “by an RFID transponder”, and the act of “emulating” clearly provides only one of many ways of outputting by the transceiver of independent claim 1.

31. The third requirement is that the RFID data/signal be generated “without the use of a physical RFID transponder.” This third alleged requirement does not appear in any of the independent or dependent claims. Further, Dr. Shamos’ assertion that “[a]ll of the independent Challenged Claims require outputting an RFID transponder signal” appears to create a contradiction that “RFID signal” of the claim be an “RFID transponder signal” “without the use of a physical RFID transponder.” *See* Ex-2004, ¶¶49-53. Specifically, Dr. Shamos’ states “[a] POSITA would have understood that an “RFID signal,” as claimed in the '947 patent, is an RFID transponder signal” but does not explain why a POSITA would have found such a signal would both be required to be i) an “RFID transponder signal” and ii) be created “without the use of a physical RFID transponder.” Additionally, to say that the signal is generated “without the use of a

⁶U.S. Pat. No. 8,127,984 – IPR2024-01363

⁷U.S. Pat. No. 8,381,974 – IPR2024-01362

physical RFID transponder” contradicts claim 9 of the ’984 patent and claim 6 of the ’947 patent which both state the action is performed “by an RFID transponder.”

32. None of the output limitations of the independent claims (e.g., limitations [1.3], [9.2], [16.1], [16.7], [26.6]) use language suggesting i) “RFID transponder signals,” ii) any type of “emulation” or iii) action “without” an RFID transponder:

Limitation	Claim Language
[1.3]	the instructions configured to cause the mobile communication device to: output an RFID signal and output a voice call signal,
[9.2]	he instructions configured to cause the mobile communication device to monitor, output an RFID signal, and output a voice call signal;
[16.1]	communication circuitry configured to output voice call signals in a first radio frequency range over a wireless network and output radio frequency identification (RFID) signals in a second radio frequency range, which is different than the first radio frequency range;
[16.7]	output an RFID signal via the communication circuitry in response to detection of the proximal presence of the RFID reader external to the mobile communication device based upon receipt of the

	RFID probing signal, wherein the RFID signal is output in the second radio frequency range.
[26.6]	in response to determining the mobile communication device is in the operational space of the RFID reader based upon the receipt of the RFID probing signal, output an RFID signal via the communication circuitry in a second radio frequency range that is different than the first radio frequency range; and

33. The requirement that transmissions occur “without the use of a physical RFID transponder” is not used in the claims, specification, or the relevant file histories. For example, [1.3] recites “the instructions configured to cause the mobile communication device to: output an RFID signal.” This limitation makes clear that the only limitation is that the “mobile communication device” output the “RFID signal.”

34. Based on my review of the specification, there is no explicit requirement that the transceiver described excludes components of a “physical RFID transponder.” Figure 4 (reproduced below) reflects a generic architecture of components without specification as to the physical implementation.

308

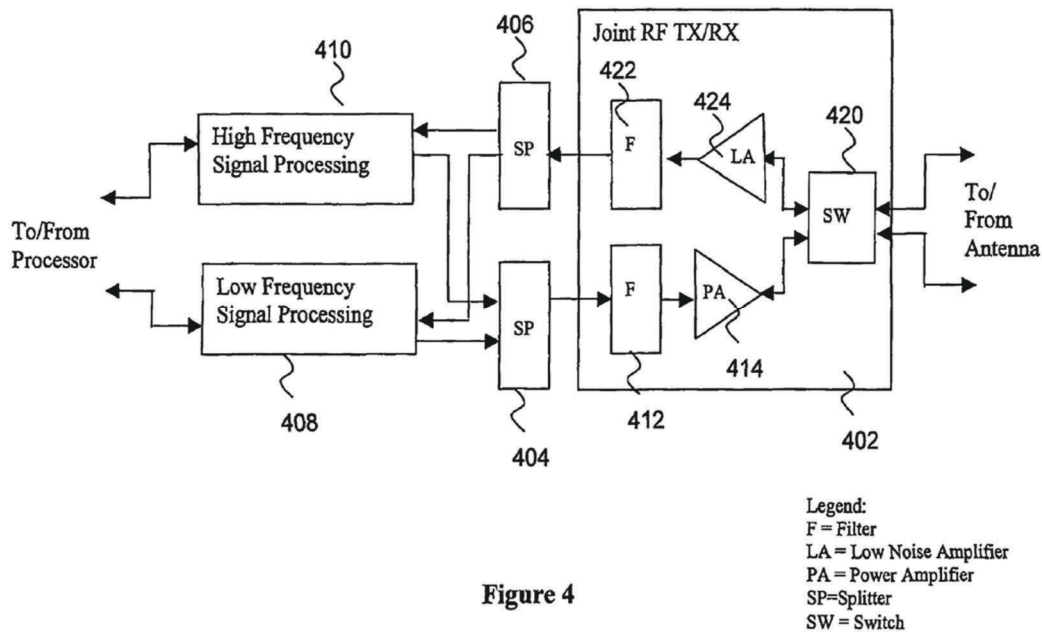


Figure 4

APPLE-1001, FIG. 4; *see id.*, 6:56-7:32.

Because the specification does not describe otherwise, a POSITA would have understood that the “transceiver”/“transmitter” described in the claims may be implemented to include a physical RFID transponder. This is consistent with the plain and ordinary meaning because physical components of an RFID transponder (e.g., antenna) are configured to transmit and receive RFID signals, making the collection of componentry in Figure 4 (including the antenna) both a physical RFID transponder and a transceiver.

35. Dr. Shamos’ interpretation also ignores well-known RFID emulation techniques that involve use of a physical RFID transponder. I disagree because the specification’s description of emulation does not describe what is a “physical”

RFID transponder, and also does not address whether or not to a “physical RFID transponder” is used in signal generation. *See, e.g.*, APPLE-1001, Abst., 3:56-65, 8:21-27. For example, Figure 4 depicts a transceiver (308), a joint RF transmit/receive section (TX/RX 402) and separate signal processing paths for voice communication and RFID signals. APPLE-1001, FIG. 4, 6:56-7:32. This architecture suggests that the device’s existing radio hardware (which could be similar in function to an RFID transponder) is reconfigured, in some states (e.g., the first or second state), to output RFID signals using the signal processing path for generating RFID signals. This is especially true when the described transceiver 308 acts as an RFID transponder e.g., for transmitting RFID signals. This architecture suggests that the ‘947 patent does not require outputting RFID signals without the use of a “physical RFID transponder.”

36. By the Critical Date, a POSITA would have also known of RFID “emulation” techniques that involve use of an RFID signal. One example is “functional emulation,” which refers to the capability of a transmitting device (e.g., mobile device) to make an external RFID reader perceive a transmission of an ordinary RFID signal as if it were transmitted from an originating device of a different device type (e.g., perceive a device that is not a passive RFID tag as if it were a passive RFID tag). This example is consistent with the specification, which describes a mobile device being used to transmit an RFID signal that is perceived

by an RFID reader as being transmitted by a dedicated RFID device such as a passive RFID tag.

37. Several ways to implement functional emulation were known by the Critical Date. One example is re-using or sharing at least one RF front-end component that the transmitting device already employs for another radio service or function (e.g., its main communications antenna, switch network, amplifier, or transceiver path) instead of relying on a self-contained, dedicated RFID module that has its own dedicated antenna and operates independently. This is consistent with the specification, which, as shown in Figure 4, includes a “joint RF TX/RX section 402” that connects to “processing sections 408 and 410” to an antenna. APPLE-1001, FIG. 4. It is also consistent with the specification’s suggestion of “advantageously leverag[ing] on existing elements of mobile communication device 102” in providing joint voice call and RFID capabilities. *Id.*, 3:56-61. One type of “existing element” is an antenna used for another radio service, as depicted in Figure 4.

38. A POSITA would have also recognized that the specification contemplates functional emulation because Figure 4 depicts architectural details not directly limited to physical hardware. The corresponding description of the figure within the specification also does not specify implementation details suggesting a signal generation techniques limited in software. *See* APPLE-1001,

6:52-7:33. This description also does not specify that physical hardware, or components of an RFID transponder, may not be used to generate the RFID signals.

39. Additionally, by referencing “mobile communication device 102” as incorporating transceiver elements shown in Figure 4, and then further describing “provid[ing] RFIDs using a mobile communication device,” the specification makes clear that it contemplates a mobile device’s transceiver being configured to generate RFID signals without being limited in hardware. A POSITA would have understood this disclosure as an example of functional emulation. In other words, the specification contemplates emulation as a functional outcome where an external RFID reader perceives an RFID signal as being transmitted from a different type of originating device, e.g., a dedicated RFID device, rather than the actual transmitting device.

40. As discussed above, techniques for achieving functional emulation of RFID signals using radio devices that may be functionally configured as “physical RFID transponders” were well-known by the Critical Date. For example, Holloway (APPLE-1006) describes a mobile device that “function[s] as an RFID smart card” (APPLE-1006, 9:4-15) through on-board, integrated RFID circuitry, thereby effectively emulating a stand-alone transponder without any separate tag. Holloway further teaches embedding “an RFID chip 16 corresponding to the chips

found in RFID smart cards” together with an antenna 17. APPLE-1006, 4:21-28.

After loading monetary data into the chip, the user “is able to operate [the telephone] for any payment application, just like with an RFID smart card” simply by presenting the phone to a reader. *Id.*, 6:22-26. This integrated arrangement “remov[es] the need for the user to carry a “separate RFID card” and is compatible with “existing RFID technology.” *Id.*, 10:16-27. Holloway’s disclosure demonstrates that a POSITA would have understood that functional emulation through use of at least parts of a “physical RFID transponder” integrated within a mobile device was well-known by the Critical Date.

41. As another example, multi-protocol RFID devices often use a physical transponder but can “emulate” different RFID standards by adjusting the modulation scheme, frequency, or data structure. In some other examples, programmable RFID tags can be configured to mimic various RFID identifiers, which constitutes functional emulation while still using transponder hardware. The switching between states (e.g., voice vs. RFID) is a functional emulation that could still use physical RF components akin to a transponder.

b. “Voice Call Signal” Limitations

42. Based on my review of the documents in this proceeding, a POSITA would not have understood the “voice call signal” limitations as interpreted in the Shamos Declaration. This is because none of the claims include the phrase “a

network of a wireless network service provider” or describe the medium through which a voice call signal is transmitted. The claims also do not include any language suggesting that the recited “voice call signal” is limited to direct communications with a base station associated with a network service provider. As previously noted, the specification also does not define “signal” beyond its plain and ordinary meaning that would suggest direct communications.

B. Application Of The Prior Art To The “RFID” Limitations, The “Operational Space” Limitations, The “Determining” Limitations, And The “Instructions” Limitations

43. I summarized the application of the prior art combinations to features described in the '947 patent in the Declaration, and I incorporate that analysis here by reference.

1. “RFID” Limitations

44. As explained in Section VIII.A.1.a, under plain meaning, the “RFID” limitations include a potential “used to convey information” using radio waves to achieve automatic identification of objects and people from one point to another. APPLE-1065, 3. A responsive RFID signal output by the communications unit of Willgert-Mooney is an example of this plain meaning understanding because it includes “identity information” and enables the communicator to determine the identity associated with a mobile device. *See* APPLE-1003, ¶¶79-84, 140-141.

45. In RFID systems where identification information is shared, the system operates by modulating the information (the identity pulse train) onto an electromagnetic carrier that propagates wirelessly from the tag to the reader. The propagated wireless signal sent from the tag is then recoverable and readable by the reader. This is displayed, in Willgert-Mooney, where the RFID signals communicated from the combination device to an RFID reader are further processed by the RFID reader (e.g., by identifying information specified in the RF waveform) to identify a unique identity associated with the transmitting mobile device.

46. Willgert's disclosure confirms this. Willgert teaches that the RFID portion of its communications unit "receives a query signal sent from a...communicator and...reflects the received signal while modulating the signal with a pulse train," the pulse train containing a "unique identity" or other stored data that the remote communicator "receives and decodes" to recognize the transmitting article. APPLE-1004, [0017]-[0018]. Willgert also explains that such RFID tags are "affixed to the object or to the person that is to be identified" and that the identity can be "read by a communicator at a given short distance, for example of five meters," thereby enabling "automatic identification" within a confined radio-frequency zone. *Id.*, [0004]-[0006]. Because the system operates by sending information (the identity pulse train) onto an electromagnetic carrier that

propagates wirelessly from the tag to the reader, it is an example of a potential “used to convey information” using radio waves to achieve automatic identification of objects and people from one point to another. APPLE-1065, 3. The disclosure that the signal is produced and modulated without any wired connection (e.g., by passive backscatter in the read-only embodiment or by active modulation when the tag has its own battery) confirms the radio-wave nature of the conveyed information. *Id.*, [0022]-[0023]. A POSITA would have therefore understood that the RFID signal output by the communications unit of Willgert-Mooney satisfies the plain meaning of “RFID signal.”

47. As explained in the Declaration, the “RFID” limitations are obvious over the RFID signal capabilities of the “communications unit” of Willgert-Mooney. APPLE-1003, ¶¶98-102 (citing APPLE-1004, [0004], [0017], [0023]); *id.*, ¶123 (citing APPLE-1004, [0022]-[0024], [0030]). The “voice call signal” limitations are rendered obvious by Bluetooth voice communication signal capabilities of the “communications unit.” *Id.*, ¶¶91-92, 99-100. The “selecting” limitations are obvious by signal output selection (*see id.*, ¶¶103-104) or user selection (*see id.*, ¶¶136-138). The “switching” limitations rendered obvious by switching associated with the dual communication capabilities of the communications unit of Willgert-Mooney. *See, e.g., id.*, ¶90.

2. ***“Selecting” Limitations***

48. The Shamos Declaration does not add any new analysis for the “selecting” limitations beyond the analysis for the “RFID” limitations. *See* Ex-2004, ¶¶81-82 (Ground 1A.

3. ***“Determining” and “Operational Space” Limitations***

49. The Shamos Declaration states that “‘determining’ [] is distinct from receiving a probing signal and distinct from outputting an RFID signal” and is “required by all Challenged Claims.” EX-2004, ¶73. Although Shamos describes some example semantic differences between “determining” and “responding” (EX-2004, ¶77), Shamos does not explain why the claim requirement of “the RFID signal is output in response to the mobile communication device determining the mobile communication device is in an operational space of the RFID reader based upon receipt of the RFID probing signal” is not met by Willgert’s process of generating a responsive communication when Willgert’s system determines that it has receive a query signal, i.e., it is within a distance of the nearby RFID reader to be able to receive a query signal.

50. The specification correlates “operational space” with “proximal presence” (APPLE-1001, 5:1-7) and further explains that a device “monitors for probing signals ... to determine whether [it] is within the operational space” and

then outputs the RFID when that condition is met (*id.*, 5:8-13). This disclosure is consistent with the plain and ordinary meaning of “operational space.”

4. ***“Instructions” Limitations***

51. The Shamos Declaration states that “[a]ll Challenged Claims require ‘instructions’ to be executed on ‘processing circuitry’ to cause the mobile communications device to output an ‘RFID signal.’” EX-2004, ¶79. Shamos then says that “Willgert has no ability to emulate an RFID transponder signal, but instead outputs RFID signals exclusively from RFID transponder 2, which is a physical transponder.” *Id.*, ¶80. First, a POSITA would not think that Willgert’s RFID transponder 2 is “exclusively” performing the transmission since it is integrated to other components necessary for the transmission (e.g., the antenna). P

52. Finally, I agree with the Panel’s statement that “[o]n the present record, we conclude this satisfies the claim requirement of ‘the RFID signal is output in response to the mobile communication device determining the mobile communication device is in an operational space of the RFID reader based upon receipt of the RFID probing signal.’” Dec., 23. The Shamos Declaration has provided no additional evidence to contradict this conclusion.

C. **Application Of The Prior Art To The “Voice Call Signal” Limitations**

53. As explained in Section VIII.A.1.b, under plain meaning, the “voice call signal” limitations include “a telephone call established for the purpose of

transmitting voice rather than data communications.” APPLE-1067, 40. A

Bluetooth voice communication signal output by the communications unit of Willgert-Mooney is an example of this plain meaning understanding because it “allows for transmitting voice communications,” and more specifically, “enabled the Bluetooth headset to ‘hear voice and/or tones’ generated from the telephone...” APPLE-1003, ¶65 (citing APPLE-1005, [0048]). A POSITA would have understood and found obvious that a Bluetooth voice communication signal involves an audio stream that a handset transmits to (or receives from) a Bluetooth-enabled phone during an active cellular call because the headset enables voice communication as an accessory to the phone rather than in place of the phone. In other words, the Bluetooth accessory is an extension of the capabilities of the phone enabling a user to have a phone-call hands free.

54. For example, in Willgert-Mooney, wireless communication of signals between the phone and the headset over Bluetooth utilizes this accessory function and is for the purposes of enabling a voice call, as opposed to, for instance, transmitting non-voice data, such as sending a text message or transferring a file. Indeed, use of Bluetooth headsets for voice calls was well-known by the Critical Date. *See* APPLE-1003, ¶64 (citing APPLE-1021, describing “Sony Ericson BT headset”); *see* APPLE-1005 (Mooney), [0007], [0034], [0046]-[0060].