

UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE PATENT TRIAL AND APPEAL BOARD

GOOGLE LLC,
Petitioner

v.

TELCOM VENTURES LLC,
Patent Owner

Patent No. 10,219,199

**PETITION FOR *INTER PARTES* REVIEW
OF U.S. PATENT NO. 10,219,199**

TABLE OF CONTENTS

I.	INTRODUCTION	1
II.	MANDATORY NOTICES	1
III.	PAYMENT OF FEES UNDER 37 C.F.R. §§ 42.15 AND 42.103	3
IV.	GROUND FOR STANDING.....	4
V.	PRECISE RELIEF REQUESTED AND GROUNDS RAISED.....	4
VI.	LEVEL OF ORDINARY SKILL	5
VII.	OVERVIEW OF THE '199 PATENT	6
VIII.	CLAIM CONSTRUCTION	8
IX.	DETAILED EXPLANATION OF GROUNDS.....	9
A.	Ground 1: Barnett and Waters Render Obvious Claims 1-2, 4-12, and 14-19.....	10
1.	Claim 1	10
2.	Claim 2.....	31
3.	Claim 4: “The method of claim 1, wherein said detecting by the smartphone that a proximity condition is satisfied between the smartphone and the entity is based, at least in part, on receiving a short-range signal from the entity over the first air interface.”	33
4.	Claim 5: “The method of claim 4, wherein said detecting by the smartphone that a proximity condition is satisfied between the smartphone and the entity is based, at least in part, on a measurement of signal strength of the short-range signal.”	34
5.	Claim 6.....	37
6.	Claim 7.....	38
7.	Claim 8.....	39
8.	Claim 9: “The method of claim 1, wherein establishing the wireless short-range communications link between the smartphone and the entity is performed in response to the physiological parameter.”	40

9.	Claim 10.....	41
10.	Claim 11: “The system according to claim 10, further comprising the entity.”.....	43
11.	Claim 12.....	44
12.	Claim 14: “The system of claim 10, wherein said detecting by the smartphone that a proximity condition is satisfied between the smartphone and an entity is based, at least in part, on receiving a short-range signal from the entity over the first air interface.”.....	44
13.	Claim 15: “The system of claim 14, wherein said detecting by the smartphone that a proximity condition is satisfied between the smartphone and an entity is based, at least in part, on a measurement of signal strength of the short-range signal.”.....	45
14.	Claim 16.....	45
15.	Claim 17.....	45
16.	Claim 18.....	46
17.	Claim 19: “The system of claim 10, wherein establishing the wireless short-range communications link between the smartphone and the entity is performed in response to the physiological parameter.”.....	46
B.	Ground 2: Barnett, Waters, and Wang Render Obvious Claims 3 and 13	47
1.	Claim 3.....	47
2.	Claim 13: “The system of claim 10, wherein the second air interface is based upon an Orthogonal Frequency Division Multiplexed (OFDM) and/or Orthogonal Frequency Division Multiple Access (OFDMA) protocol.”.....	54
C.	Ground 3: Barnett, Waters, and Sakamoto Render Obvious Claims 5 and 15.....	54
1.	Claim 5: “The method of claim 4, wherein said detecting by the smartphone that a proximity condition is satisfied between the smartphone and the entity is based, at least	

	in part, on a measurement of signal strength of the short-range signal.”	54
2.	Claim 15: “The system of claim 14, wherein said detecting by the smartphone that a proximity condition is satisfied between the smartphone and an entity is based, at least in part, on a measurement of signal strength of the short-range signal.”	62
X.	DISCRETIONARY DENIAL IS NOT APPROPRIATE	62
XI.	CONCLUSION.....	63

LIST OF EXHIBITS

EX1001	U.S. Patent No. 10,219,199 to Karabinis et al. (“the ’199 patent”)
EX1002	Declaration of Sandeep Chatterjee, Ph.D.
EX1003	Curriculum Vitae of Sandeep Chatterjee, Ph.D.
EX1004	Prosecution History of U.S. Patent App. No. 15/800,885
EX1005	U.S. Patent Application Publication No. 2009/0170483 A1 to Barnett et al. (“Barnett”)
EX1006	International Patent Publication No. WO 2006/087503 A1 to Waters et al. (“Waters”)
EX1007	RESERVED
EX1008	International Patent Publication No. WO 2006/094048 A2 to Morrison (“Morrison”)
EX1009- EX1021	RESERVED
EX1022	U.S. Patent No. 7,881,665 to Symons (“Symons”)
EX1023	U.S. Patent No. 9,301,337 to Brown et al. (“Brown”)
EX1024	U.S. Patent No. 8,249,500 to Wilson (“Wilson”)
EX1025	U.S. Patent No. 7,400,903 to Shoemake et al. (“Shoemake”)
EX1026	U.S. Patent Application Publication No. 2007/0286147 A1 to Wang et al. (“Wang”)
EX1027- EX1028	RESERVED
EX1029	U.S. Patent Application Publication No. 2007/0026893 A1 to Sakamoto et al. (“Sakamoto”)

I. INTRODUCTION

Google LLC (“Petitioner”) respectfully requests *inter partes* review of claims 1-19 (“the challenged claims”) of U.S. Patent No. 10,219,199 (“the ’199 patent”) (EX1001) assigned to Telcom Ventures LLC (“Patent Owner”).

II. MANDATORY NOTICES

Real Parties-in-Interest: Pursuant to 37 C.F.R. § 42.8(b)(1), Petitioner identifies Google LLC as the real party-in-interest.¹

Related Matters: The ’199 patent is asserted in *Telcom Ventures LLC v. Samsung Electronics Co., Ltd.*, Case No. 2:24-cv-00691 (E.D. Tex.) and *Telcom Ventures LLC v. Apple Inc.*, Case No. 3:25-cv-05041 (N.D. Cal.).

The ’199 patent is also at issue in *Samsung Electronics America, Inc. v. Telcom Ventures LLC*, IPR2025-00972 (PTAB) and *Apple Inc. v. Telcom Ventures LLC*, IPR2025-01234 (PTAB). Petitioner has had no involvement in any way with these earlier IPRs.

The ’199 patent originates from U.S. Patent Application No. 15/800,885, filed on November 1, 2017, which is a continuation of application No. 15/251,882, filed

¹ Google LLC is a subsidiary of XXVI Holdings Inc., which is a subsidiary of Alphabet Inc. XXVI Holdings Inc. and Alphabet Inc. are not real parties-in-interest to this proceeding.

on August 30, 2016, now Patent No. 9,832,708 (“the ’708 patent”), which is a continuation of application No. 12/264,711, filed on November 4, 2008, now Patent No. 9,462,411 (“the ’411 patent”). (EX1001, Cover.)

The ’708 and ’411 patents, as well as related U.S. Patent Nos. 10,674,432 (“the ’432 patent”), 11,770,756 (“the ’756 patent”), 11,924,743 (“the ’743 patent”), 11,937,172 (“the ’172 patent”), and 12,028,793 (“the ’793 patent”), are all also at issue in *Telcom Ventures LLC v. Samsung Electronics Co., Ltd.*, Case No. 2:24-cv-00691 (E.D. Tex.) and *Telcom Ventures LLC v. Apple Inc.*, Case No. 3:25-cv-05041 (N.D. Cal.).

Petitioner has filed IPR petitions challenging the ’743, ’172, ’793, ’708, and ’756 patents in *Google LLC v. Telcom Ventures LLC*, IPR2025-01349 (PTAB); *Google LLC v. Telcom Ventures LLC*, IPR2025-01389 (PTAB); *Google LLC v. Telcom Ventures LLC*, IPR2025-01401 (PTAB); *Google LLC v. Telcom Ventures LLC*, IPR2025-01408 (PTAB); and *Google LLC v. Telcom Ventures LLC*, IPR2025-01409 (PTAB).

Additionally, the ’411, ’708, ’432, ’756, ’743, ’172, and ’793 patents are at issue in *Samsung Electronics America, Inc. v. Telcom Ventures LLC*, IPR2025-00973 (PTAB); *Samsung Electronics America, Inc. v. Telcom Ventures LLC*, IPR2025-00975 (PTAB); *Samsung Electronics America, Inc. v. Telcom Ventures LLC*, IPR2025-00974 (PTAB); *Samsung Electronics America, Inc. v. Telcom*

Ventures LLC, IPR2025-00977 (PTAB); *Samsung Electronics America, Inc. v. Telcom Ventures LLC*, IPR2025-00976 (PTAB); *Samsung Electronics America, Inc. v. Telcom Ventures LLC*, IPR2025-00957 (PTAB); *Samsung Electronics America, Inc. v. Telcom Ventures LLC*, IPR2025-00978 (PTAB); *Apple Inc. v. Telcom Ventures LLC*, IPR2025-01232 (PTAB); *Apple Inc. v. Telcom Ventures LLC*, IPR2025-01233 (PTAB); *Apple Inc. v. Telcom Ventures LLC*, IPR2025-01235 (PTAB); *Apple Inc. v. Telcom Ventures LLC*, IPR2025-01236 (PTAB); *Apple Inc. v. Telcom Ventures LLC*, IPR2025-01237 (PTAB); *Apple Inc. v. Telcom Ventures LLC*, IPR2025-01238 (PTAB); and *Apple Inc. v. Telcom Ventures LLC*, IPR2025-01239 (PTAB). Petitioner has had no involvement in any way with those earlier IPRs.

Counsel and Service Information: Lead counsel is Naveen Modi (Reg. No. 46,224). Backup counsel are Daniel Zeilberger (Reg. No. 65,349), Quadeer Ahmed (Reg. No. 60,835), Alexa Lowman (*pro hac vice* to be filed), and Maksim Mints (Reg. No. 78,507). Service information is Paul Hastings LLP, 2050 M Street NW, Washington, D.C. 20036, Tel.: 202.551.1700, Fax: 202.551.1705, email: PH-Google-Telcom-IPR@paulhastings.com. Petitioner consents to electronic service.

III. PAYMENT OF FEES UNDER 37 C.F.R. §§ 42.15 AND 42.103

The PTO is authorized to charge any fees due during this proceeding to Deposit Account No. 50-2613.

IV. GROUNDS FOR STANDING

Petitioner certifies under 37 C.F.R. § 42.104(a) that the '199 patent is available for review and Petitioner is not barred or estopped from requesting review on the grounds identified herein.

V. PRECISE RELIEF REQUESTED AND GROUNDS RAISED

Petitioner respectfully requests review of claims 1-19 of the '199 patent and cancellation of these claims as unpatentable. The challenged claims should be found unpatentable on the following grounds:

Ground 1: Claims 1-2, 4-12, and 14-19 are unpatentable under pre-AIA 35 U.S.C. § 103 as being obvious in view of U.S. Patent Application Publication No. 2009/0170483 A1 to Barnett et al. ("Barnett") (EX1005) and International Patent Publication No. WO 2006/087503 A1 to Waters et al. ("Waters") (EX1006).

Ground 2: Claims 3 and 13 are unpatentable under pre-AIA 35 U.S.C. § 103 as being obvious in view of Barnett, Waters, and U.S. Patent Application Publication No. 2007/0286147 A1 to Wang et al. ("Wang") (EX1026).

Ground 3: Claims 5 and 15 are unpatentable under pre-AIA 35 U.S.C. § 103 as being obvious in view of Barnett, Waters, and U.S. Patent Application Publication No. 2007/0026893 A1 to Sakamoto et al. ("Sakamoto") (EX1029).

The earliest possible priority date of the '199 patent is November 4, 2008.² Barnett published from an application filed December 28, 2007 (EX1005, Cover), and thus qualifies as prior art under at least § 102(e). Waters published on August 24, 2006 from an application filed February 15, 2005 (EX1006, Cover), and thus qualifies as prior art under at least §§ 102(a), (b), and (e). Wang published on December 13, 2007 from an application filed on October 9, 2004 (EX1026, Cover), and thus qualifies as prior art under at least §§ 102(a) and (e). Sakamoto published on February 1, 2007 (EX1029, Cover), and thus qualifies as prior art under at least §§ 102(a) and (b).

Barnett, Waters, Wang, and Sakamoto were not considered by the Office during prosecution. (EX1001, Cover; *see also generally* EX1004.)

VI. LEVEL OF ORDINARY SKILL

A person of ordinary skill in the art at the time of the alleged invention of the '199 patent ("POSITA") would have had an undergraduate degree in electrical engineering, computer engineering, computer science or a related field along with two years of work experience in the field of mobile communication applications.

² Petitioner does not concede that the '199 patent is entitled to a November 4, 2008, priority date.

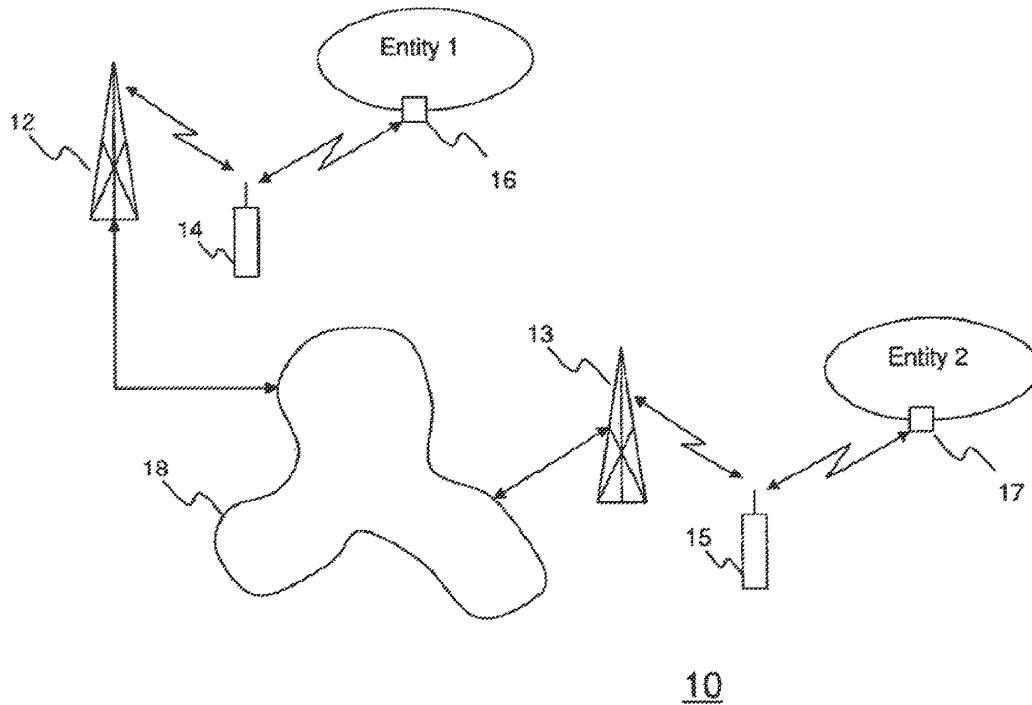
(EX1002, ¶¶20-21.)³ More education can supplement practical experience and vice versa. (*Id.*)

VII. OVERVIEW OF THE '199 PATENT

The '199 patent “relates to systems, devices and/or methods that may be used to provide an adaptive enablement of one or more communications modes based upon having satisfied a proximity criterion.” (EX1001, 1:18-21; EX1002, ¶¶22-24.) The '199 patent describes a system containing what it refers to as a first device 14, a second device 15, an entity 1 and entity 2, and a communications system 18, among other components. (EX1001, 8:65-10:35.) The '199 patent explains that the devices 14 and 15 may be mobile devices such as a mobile phone. (*Id.*, 3:5-14.) Entity 1 and entity 2 may be “a person, an animal, a vehicle..., a building..., a product that is for sale, a store that sells one or more products, a check-out counter in a store, a shopping cart that may be used by a customer to carry one or more products selected by the customer for purchase, one or more locations in time and/or space, a geographic area and/or a multi-dimensional region in time and/or space.” (*Id.*, 3:43-51.) The communications system 18 may be, for example, a wireless

³ Petitioner submits the declaration of Dr. Sandeep Chatterjee (EX1002), an expert in the field of the '199 patent. (EX1002, ¶¶1-19; EX1003.)

communications system that wirelessly communicates with the first and second devices. (*Id.*, 12:10-14.)



(*Id.*, FIG. 1; EX1002, ¶22.)

The '199 patent broadly describes communication features between these devices and entities. For example, “a method in a system 10 is provided comprising: detecting that a proximity criterion is satisfied between a first device 14, such as a mobile subscriber device, and Entity 1; and enabling a mode of the first device and/or a mode of a second device 15 responsive to the detecting.” (EX1001, 8:67-9:6.) “In one particular embodiment, a mobile subscriber device 14 linked to a communications system 18 via base station 12 can enable a function when the device 14 comes within a proximity of Entity 1.” (*Id.*, 9:10-13; EX1002, ¶23.)

The claims of the '199 patent focus on an embodiment in which “the first device and the second device form a part of a communication system providing communications service to the first device,” where “[t]he second device can be independent of the entity and the entity can be independent of the communications service provided to the first and second device.” (EX1001, 11:38-47; *see also id.*, claims 1-19.) In particular, the '199 patent describes “a detector that is configured to enable a mode of a first device (14) and/or to enable a mode of a second device (15) responsive to a detection that a proximity criterion is satisfied between the first device and an entity (Entity 1) and responsive to at least one of a position, velocity and a Time-of-Day.” (*Id.*, Abstract.) The '199 patent further explains that “the second device is not the entity and is not associated with the entity, and...the entity is not involved in providing a communications service to the first and/or second device.” (*Id.*; EX1002, ¶24.)

VIII. CLAIM CONSTRUCTION

For IPR proceedings, the Board applies the claim construction standard set forth in *Phillips v. AWH Corp.*, 415 F.3d 1303 (Fed. Cir. 2005) (*en banc*). *See* 83 Fed. Reg. 51,340-59 (Oct. 11, 2018). Under *Phillips*, claim terms are typically given their ordinary and customary meanings, as would have been understood by a POSITA, at the time of the invention, having taken into consideration the language

of the claims, the specification, and the prosecution history of record. *Phillips*, 415 F.3d at 1313; *see also id.* at 1312-16.

The Board, however, only construes the claims when necessary to resolve the underlying controversy. *Toyota Motor Corp. v. Cellport Sys., Inc.*, IPR2015-00633, Paper No. 11 at 16 (P.T.A.B. Aug. 14, 2015) (citing *Vivid Techs., Inc. v. Am. Sci. & Eng'g, Inc.*, 200 F.3d 795, 803 (Fed. Cir. 1999)). Here, given the correlation between the prior art references and the challenged claims of the '199 patent, the Board need not construe any terms of the challenged claims to resolve the underlying controversy, as any reasonable construction reads on the prior art. (EX1002, ¶45.)⁴

IX. DETAILED EXPLANATION OF GROUNDS

As detailed below, each of the challenged claims are unpatentable. (EX1002, ¶¶46-122; *see also id.*, ¶¶25-44.)

⁴ Petitioner reserves all rights to raise claim construction and other arguments in other venues.

A. Ground 1: Barnett and Waters Render Obvious Claims 1-2, 4-12, and 14-19

1. Claim 1

- i) [1.pre] **“A method of operating a smartphone to wirelessly provide information to an entity using a first air interface, to wirelessly receive information from the entity using the first air interface; and to wirelessly receive a communications service from a wireless network using a second air interface that differs from the first air interface, wherein the communications service is received by the smartphone from the wireless network absent involving the entity and wherein the entity functions independently of the communications service, the method comprising:”**

To the extent the preamble is limiting, Barnett discloses the limitations therein. (EX1002, ¶¶47-56.)

Barnett discloses a “system and method of communicating shopping information between a consumer and a retailer,” including a “system for enabling a consumer to obtain shopping information from a retailer, and the retailer to obtain information from the consumer, using a communication device, such as a mobile phone.” (EX1005, ¶[0001]; *see also* EX1002, ¶¶25-30.) Barnett explains that “a consumer may utilize...a portable communications device 14, such as a mobile phone” (“smartphone”) (*id.*, ¶[0011]), which is “adapted to communicate with a Near Field Communication (NFC) device, a wireless network, such as a Wi-Fi system, and a Bluetooth system, as well as a cellular phone system” (*id.*, ¶[0012]). Barnett describes that the “mobile phone 14 combines the functions of a Wi-Fi

device, a contact-less credit card, and a cell phone” (*id.*, ¶[0012]), and thus a POSITA would have understood that a consumer’s mobile phone operates as a “smartphone” because it has advanced features beyond the standard calling and texting features of a cellular phone. (EX1002, ¶48.)

Barnett explains that a store may have “stand-alone NFC-enabled devices 34 [which] are used to identify products to NFC-enabled devices.” (EX1005, ¶[0023].) As shown in Figure 1 below, a consumer may place their “NFC-enabled mobile phone 14” (in red below) “proximate to the product identifier 34” (in yellow below) so that “information is extracted from the product identifier 34 and transmitted to, and stored within, the NFC-enabled mobile phone 14 in a manner similar to a bar code reader.” (*Id.*, ¶[0023].) For example, the consumer may “retrieve and store information” such as “the identity of the product” (*id.*, ¶[0033]), which may further include “the name of the produce and the price of the product, as well as technical information about the product, such as the specifications” (*id.*, ¶[0023]).

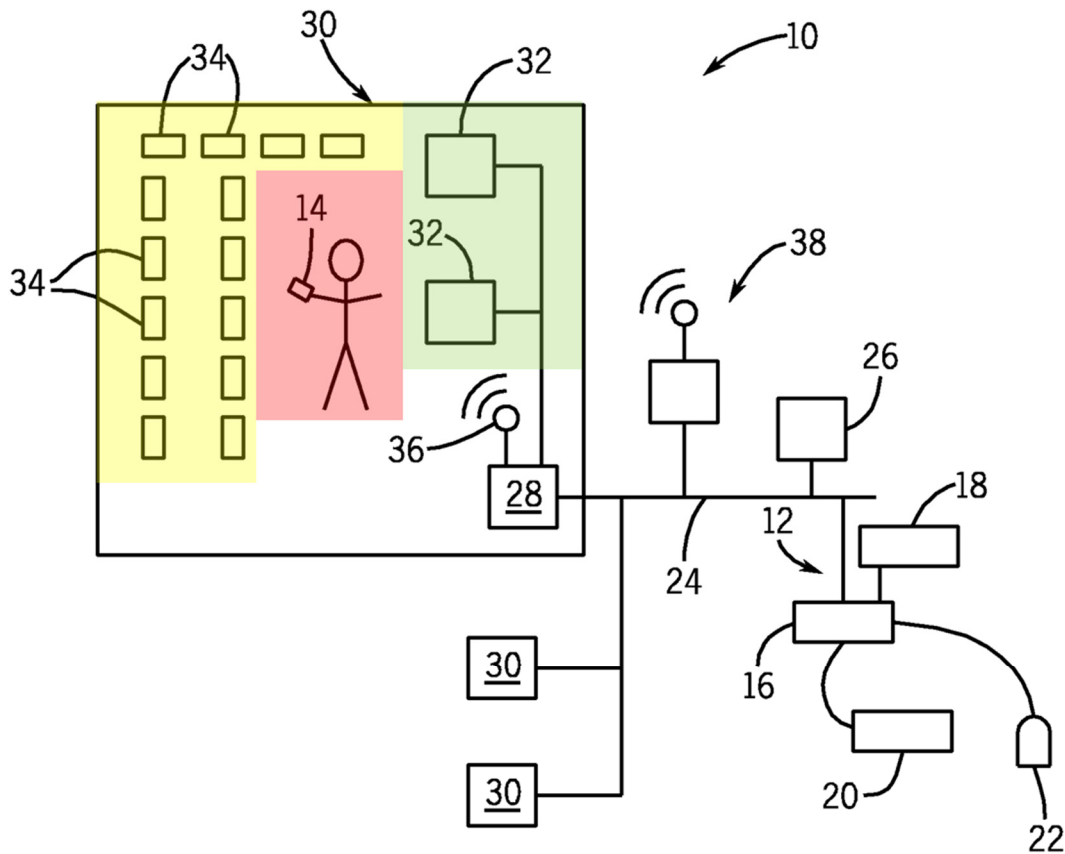
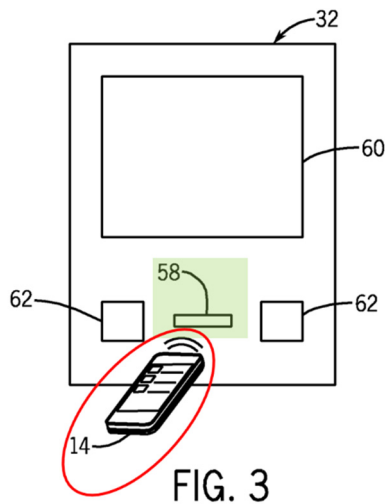


FIG. 1

(*Id.*, FIG. 1 (annotated); EX1002, ¶49.)

Barnett also explains that “[w]ithin the store 30 are a series of displays 32 that are connected to the store computing system 28.” (EX1005, ¶[0021].) These “displays 32” (in green above) may be “NFC-enabled displays that can interact with a NFC-enabled mobile phone 14 using device-to-device communication.” (*Id.*) “The NFC-enabled display 32,” as shown in Figure 3 below, “has an NFC interface 58” (in green) “that is adapted to transmit data between the mobile phone 14 and the

display 32.” (*Id.*, ¶[0038].) For example, Barnett discloses that “the mobile phone 14 may be programmed to provide a specific credit card number when the mobile phone 14 is used in making purchases in a specific store.” (*Id.*, ¶[0032].)



(*Id.*, FIG. 3 (annotated); EX1002, ¶50.) Barnett discloses that transmission of data between the consumer’s phone (in red above) and the NFC display 32 via NFC interface 58 (in green above) may occur when devices are within “a short distance, such as a decimeter.” (EX1005, ¶[0013]; EX1002, ¶50.)

Barnett explains that the NFC displays 32 have multiple purposes. (EX1002, ¶51.) First, Barnett discloses that after retrieving product identity information from devices 34, a “consumer may then place the mobile phone 14 proximate to a NFC-display 32 which reads the product identity information from the mobile phone 14 and retrieves additional information regarding the product to the consumer.” (EX1005, ¶[0033].) For example, the “information received from the retailer may

include product information, such as the shopping list,” “the location within the store 30 of the products on the shopping list,” and “[p]romotional information, such as discounts.” (*Id.*, ¶[0031].) This information may be sent to and “displayed...on...the mobile phone 14.” (*Id.*, ¶[0034]; EX1002, ¶51.)

Second, “[t]he mobile phone 14 may be programmed to be in an operating mode to learn about the current store using the NFC display 32.” (EX1005, ¶[0031].) “For example, the mobile phone 14 may send a query to the NFC-enabled display 32 to inform the mobile phone 14 the identity of the retailer and the location of the retailer’s store,” where the information returned to the phone “may be used to configure the mobile phone 14 as a loyalty card for the specific retailer.” (*Id.*) In addition, “[t]he information received from the NFC-enabled display 32 may be used to configure the mobile phone 14 for the specific retailer and/or the specific store,” so that “the mobile phone 14 may be programmed to provide a specific credit card number when the mobile phone 14 is used in a specific store.” (*Id.*, ¶[0032].) Barnett also discloses that configuration “[i]nformation to enable the consumer to use the store’s Wi-Fi system 36 may be retrieved from the NFC-enabled display 32,” such that “all of the information needed to automatically configure the mobile phone 14 to use the store[’]s Wi-Fi system 36 is provided to the mobile phone 14 via the NFC-enabled display 32.” (*Id.*, ¶[0035]; EX1002, ¶52.)

Third, “[t]he display [32], using the NFC interface, may be used to complete the transaction using the cell phone as a credit card, debit card, or electronic purse.” (EX1005, ¶[0040]; *see also id.*, ¶[0037] (“The consumer can use the cell phone as a credit card to complete the purchase process by using a NFC-enabled payment register.”).) When completing a transaction, the mobile phone transmits the credit or debit card information to the NFC display 32, as discussed above. (*Id.*, ¶[0032].) In addition, “[a]ny promotional or special offers stored in the mobile phone 14 are retrieved from the mobile phone 14 at check-out.” (*Id.*, ¶[0040]; EX1002, ¶53.)

Thus, Barnett discloses “[a] method of operating a smartphone,” e.g., to shop in a store and perform a financial transaction, by wirelessly interacting with an NFC display 32 (“entity”) using NFC communication (“first air interface”). (EX1002, ¶54; *see also* EX1005, ¶[0038] (discussing NFC communication through NFC interface 58); EX1006, 8-9 (disclosing establishing communications based on “Near Field Communication Interface and Protocol (NFCIP-I)”)). As discussed above, this method involves wirelessly providing various information (e.g., product identity information, retailer identity/location, credit/debit card number, promotional offers) to the NFC display 32 using NFC (“wirelessly provide information to an entity using a first air interface”), and wirelessly receiving various information (e.g., product information, shopping list, product locations, promotional information, loyalty/credit/debit card configuration information, Wi-Fi configuration

information) from the NFC display 32 using NFC communication (“wirelessly receive information from the entity using the first air interface”). (EX1002, ¶54.)

As discussed above, the type of information that is wirelessly provided to, or wirelessly received from, the NFC display 32 depends on the purpose of the consumer’s interaction with the NFC display 32 (e.g., the consumer may engage with the NFC display 32 in a product information learning mode, an operating mode, or a payment mode). (*Id.*)

Barnett also discloses that the smartphone may be operated using various other communication interfaces, including using a cellular communication system (“using a second air interface that differs from the first air interface”) to access the Internet. (*Id.*, ¶55.) Barnett explains that the mobile phone “operat[es] with a cellular network” (EX1005, ¶[0005]) and comprises a “cellular phone system 38 [that] enables the consumer to use the mobile phone as a phone...[and] enables the consumer to use the mobile phone 14 to access the Internet” (*id.*, ¶[0027]). For example, “[i]nformation from the retailer may be provided to the mobile phone 14 via the cellular phone system 38.” (*Id.*, ¶[0027].) Barnett explains that if the cellular phone system is used to access the Internet, the service is provided “using the data connection on a cellular carrier.” (*Id.*, ¶[0016].) Accordingly, Barnett discloses wirelessly receiving cellular service (“and to wirelessly receive a communications service”) from a cellular network (“from a wireless network”) using a cellular

communication system (“using a second air interface that differs from the first air interface”). (EX1002, ¶55.) A POSITA would have understood that the cellular service is received by the phone from the cellular network without involving the NFC display 32 (“wherein the communications service is received by the smartphone from the wireless network absent involving the entity”) and such that the NFC display 32 operates independently of any cellular service (“wherein the entity functions independently of the communications service”) because cellular service does not depend on or involve NFC communications, and Barnett does not disclose any dependence between the cellular communications and NFC communications. (*Id.*; EX1005, ¶¶[0012] (describing the contact-less credit card features (e.g., those involving communication between a phone and NFC device) and cell phone features of Barnett’s mobile phone as distinct identities despite both being present in the same phone), [0041] (describing a “cellular phone capability” and “cellular phone interface” distinct from NFC, Wi-Fi, and Bluetooth capabilities/interfaces); *see also id.*, ¶¶[0005], [0016], [0017], [0027] (additionally describing the cellular communication system without describing any dependence between the cellular and NFC communication systems).)

ii) [1.a] “detecting by the smartphone that a proximity condition is satisfied between the smartphone and the entity;”

Barnett discloses this limitation. (EX1002, ¶57.) As discussed for limitation [1.pre], Barnett discloses that transmission of data between the consumer’s phone and the NFC display 32 via NFC interface 58 may occur when devices are within “a short distance, such as a decimeter.” (EX1005, ¶[0013]; *see also id.*, ¶[0038], FIG. 3; Section IX.A.1.i.) A POSITA would have recognized that the NFC-enabled mobile phone must therefore detect that it is within a sufficiently short distance of the NFC-enabled display 32’s NFC interface in order for the phone to enable transmission/receipt of data between the phone and NFC display 32 (“detecting by the smartphone that a proximity condition is satisfied between the smartphone and the entity”). (EX1002, ¶57.) Indeed, Barnett explains that “a connection through a NFC link indicates that the two devices are in close physical proximity to each other.” (EX1005, ¶[0025], *see also id.*, ¶¶[0031] (“the consumer **places their mobile phone 14 proximate to an NFC-enabled display 32**”), [0032] (“[O]nce this [payment] information is initially programmed into the mobile phone 14, the configuration of the mobile phone 14 as a credit card is done automatically simply by **placing the mobile phone 14 proximate to the NFC-enabled display 32** so that the desired information may be exchanged between the two.”).) (EX1002, ¶57.)

- iii) [1.b] “in response to at least the proximity condition having been satisfied between the smartphone and the entity, establishing a wireless short-range communications link between the smartphone and the entity to provide by the smartphone, using the first air interface, information to the entity and to receive by the smartphone information from the entity;”

Barnett discloses this limitation. (EX1002, ¶58.) As discussed for limitations [1.pre]-[1.a], a consumer’s phone is brought within a certain proximity of the NFC display 32 (“in response to at least the proximity condition having been satisfied between the smartphone and the entity”) to establish an NFC link between the two devices (“establishing a wireless short-range communications link between the smartphone and the entity”) in order transmit information (e.g., product identity information, retailer identity/location, credit/debit card number, promotional offers), using NFC, from the consumer’s phone to the NFC display 32 (“to provide by the smartphone, using the first air interface, information to the entity”) and to receive information, using NFC, from the NFC display 32 (e.g., product information, shopping list, product locations, promotional information, loyalty/credit/debit card configuration information, Wi-Fi configuration information) (“receive by the smartphone information from the entity”), depending upon the purpose of the consumer’s engagement with the NFC display 32 (e.g., engaging in a product information learning mode, an operating mode, or a payment mode). (*See* Sections IX.A.1.i-ii; EX1002, ¶58.) Barnett describes the “NFC link” between the two

devices (EX1005, ¶[0025]) as “short-range high frequency wireless communication...which enables the exchange of data between devices over about a short distance, such as a decimeter” (“wireless short-range communications link between the smartphone and the entity”) (*id.*, ¶[0013]). (EX1002, ¶58.)

- iv) [1.c] “in response to at least the proximity condition having been satisfied between the smartphone and the entity and in response to a physiological parameter, wirelessly providing by the smartphone, using the first air interface, information to the entity and wirelessly receiving by the smartphone, using the first air interface, information from the entity independently of, and absent involving the entity in, receiving by the smartphone the communications service from the wireless network using the second air interface; and”

Barnett in view of Waters discloses and/or suggests this limitation. (EX1002, ¶¶59-68.)

As discussed for limitations [1.pre]-[1.a], if the consumer’s phone is brought within a sufficiently short proximity of the NFC display 32 (“in response to at least the proximity condition having been satisfied between the smartphone and the entity”), information (e.g., product identity information, retailer identity/location, credit/debit card number, promotional offers) may be transmitted by the phone to the NFC display 32 using NFC (“wirelessly providing by the smartphone, using the first air interface, information to the entity”) and information (e.g., product information, shopping list, product locations, promotional information, loyalty/credit/debit card configuration information, Wi-Fi configuration

information) may be received by the phone from the NFC display 32 using NFC (“wirelessly receiving by the smartphone, using the first air interface, information from the entity”), depending upon the purpose of the consumer’s engagement with the NFC display 32 (e.g., engaging in a product information learning mode, an operating mode, or a payment mode). (See Sections IX.A.1.i-ii.) As further discussed for limitation [1.pre], this transmission/receipt of information between the phone and NFC display 32 is independent from the phone receiving cellular service from a cellular network using the cellular communications system (“independently of...receiving by the smartphone the communications service from the wireless network using the second air interface”), and the NFC display 32 is not involved in the receipt of cellular service in any way (“absent involving the entity in, receiving by the smartphone the communications service from the wireless network using the second air interface”). (See Section IX.A.1.i; EX1002, ¶59.)

While Barnett does not explicitly disclose that the transmission and receipt of information between the consumer’s phone and NFC display 32 occurs “in response to a physiological parameter,” a POSITA would have been motivated and found it obvious to implement this feature in view of Waters, such that NFC capabilities are enabled in response to a physiological parameter being sensed. (EX1002, ¶60.)

Like Barnett, Waters discloses a system/method of performing a financial transaction using an NFC-enabled mobile device. (*Id.*, ¶61; *see also id.*, ¶¶31-36.)

For example, Waters discloses a “mobile terminal 1” such as a “handheld mobile telephone” (EX1006, 4), which includes a “near field or RFID tag 41” (*id.*, 8). Waters discloses that the near field tag of the mobile terminal may be used to conduct various transactions, such as paying for public transport, making a toll fee payment, or paying for a school lunch. (*Id.*, 1 (“Near field or RFID tags are known. Such tags may be incorporated into smart cards or other devices for use in obtaining entry to buildings or as **electronic tickets for use of public transport or toll fee payment.**”), 11 (“In the second example, a user wishes to use the near field tag 41 of the mobile terminal 1 to **pay for travel by public transport** (for example on the London Underground), where entry barriers are equipped with a suitable near field tag reader.”), 11 (“A similar arrangement could be used, for example, to **enable a school child to pay for their lunch** using the near field tag 41.”).) Waters discloses that the near field tag is able to “exchange information with a tag reader when the two are brought into close proximity.” (*Id.*, 9.) Thus, Waters is similar to Barnett, which discloses a system/method of purchasing products in a store at an NFC-enabled display/register using an NFC-enabled mobile device. (*See* Section IX.A.1.i.) In other words, both Barnett and Waters relate to conducting financial transactions using a mobile device based at least in part on proximity of the mobile device to a point-of-sale device. A POSITA would have therefore been motivated

to consider the teachings of Waters when implementing Barnett's system/method.
(EX1002, ¶61.)

Waters additionally discloses that “the mobile telecommunication device is operable to selectively enable the near field communication device.” (EX1006, 4.) Waters explains that “[t]he near field tag 41 may be selectively enabled and disabled in order to reduce the opportunity to obtain information from the near field tag 41 by an unauthorised reader.” (*Id.*, 13.) For example, Waters discloses various types of sensors that can be used to activate the near field/RF tag, such as a pressure sensor (in combination with a fingerprint or skin resistance sensor) or heat sensor. (*Id.*, 15-16; EX1002, ¶62.) Waters provides this functionality to enhance the device's security features for conducting financial transactions. (EX1002, ¶62; EX1006, Title (“Improved Security for Wireless Communication”), Abstract, 2 (“The present invention, in one aspect, seeks to provide additional or improved security.”), 4, 13-16.)

Waters discloses that a “pressure sensor on the casing of mobile terminal 1” may “act[] as a switch,” where the near field/“RF tag 41 is *only enabled* when the user physically presses the pressure sensor,” and is otherwise disabled (e.g., when in a case or user's pocket). (EX1006, 15.) Such a “pressure sensor may be combined with [a] fingerprint scanner 45” so that “[t]he combined sensor detects, not only that pressure is applied, but also that an authorized person is pressing the sensor.” (*Id.*;

see also id., 14 (“[T]he mobile terminal 1 may incorporate a fingerprint reader 45. The **fingerprint reader 45 scans the fingerprint of the user when the user’s finger is placed on the reader 45 and compares it to the user’s fingerprint stored in the memory of the mobile terminal 1** or the SIM 15. If the fingerprints are determined to match, the message is sent from the SIM 15, via link 43, to the RF tag 41.”); EX1002, ¶63.)

“Alternatively, the pressure sensor could be combined with an electrical resistance meter and used to detect that it is a human hand pressing the pressure sensor, rather than some other object.” (EX1006, 15.) For example, Waters explains that “a skin resistance sensor may be provided on the casing of the mobile terminal 1 in dependence of the presence of the pressure sensor described above.” (*Id.*, 16.) “The near field tag 41 will ***only be operated*** when an appropriate resistance, capacitance or inductance is detected, indicating that the user’s hand is touching the sensor.” (*Id.*; EX1002, ¶64.)

“Heat sensors” can similarly be “incorporated in an appropriate position on the casing of the mobile terminal 1” and “configured to detect that the mobile terminal is in a user’s hand by detecting the heat from the hand, and ***only enabling*** the near field tag 41 when heat from the hand is so detected.” (EX1006, 15-16; EX1002, ¶65.)

Accordingly, Waters discloses that “in response to a physiological parameter” being sensed (e.g., a fingerprint matches a certain user and the pressure is actively being applied, a resistance sensor and pressure sensor combination detects that a human hand is actively pressing the sensor, or heat from the user’s hand is actively being applied) by a phone sensor (e.g., fingerprint/pressure sensor, skin resistance/pressure sensor, or heat sensor) and meeting some criterion, the near field tag is enabled so as to allow for the transmission/receipt of information (e.g., for conducting a transaction) using NFC between a user’s phone and an NFC reader (“wirelessly providing by the smartphone, using the first air interface, information to the entity and wirelessly receiving by the smartphone, using the first air interface, information from the entity”). (EX102, ¶66.)

A POSITA would have been motivated to incorporate such a sensing mechanism, similar to that disclosed by Waters, to selectively enable/disable the NFC tag in Barnett’s device. (*Id.*, ¶67.) Waters explains that the selective enablement/disablement of the near field tag is intended to improve the security of the tag to prevent unauthorized access (e.g., by an unauthorized reader). (EX1006, 9 (**“In order to improve the security of the near field tag, in the present embodiment, it is proposed to use the SIM 15 of mobile terminal 1 to control to some extent the operation of the near field tag 41....In this embodiment, the authentication of the SIM 15 is used to protect data held by the memory of the**

near field tag 41 from unauthorised access.”), 13 (“The near field tag 41 may be selectively enabled and disabled in order to reduce the opportunity to obtain information from the near field tag 41 by an unauthorised reader.”).) A POSITA would have understood the benefit of such a security measure in the context of Barnett’s system/method, which as discussed above, involves a user interacting with many NFC readers/displays in the same store. (EX1002, ¶67.) Barnett explains that these NFC readers are largely unmonitored by retail workers, since the goal of the invention is to reduce the number of higher cost human employees in the store. (EX1005, ¶[0043].) A POSITA would have understood that the presence of employees provides a security benefit to a store by deterring theft or other unauthorized access to merchandise and store technology. (EX1002, ¶67.) For example, in a store with more employees, a bad actor may be less likely to install a card skimming device or similar unauthorized NFC reader to gain access to customer credit/debit card information. (*Id.*) A POSITA would have thus recognized the importance of implementing security features at each user’s mobile phone in an environment with fewer employees, so as to reduce the risk of unauthorized access by an unauthorized NFC reader. (*Id.*) Barnett also emphasizes that security is an important feature of mobile phone communication technologies by explaining, for example, the benefits of authentication mechanisms for accessing wireless internet (EX1005, ¶¶[0005], [0012]) and “secure” Bluetooth technologies (*id.*, ¶[0017]). A

POSITA would have thus recognized that communication security is important to the mobile phone and would have been motivated to implement security improvements to the mobile phone's NFC technology, e.g., by selectively enabling/disabling the NFC tag to prevent access by an unauthorized reader. (EX1002, ¶67.) A POSITA would have understood that selectively enabling and disabling the NFC tag of a mobile phone would have numerous user experience benefits as well, such as preventing unintended financial transactions or other unintended use of the NFC tag, and helping preserve mobile phone battery by disabling the NFC tag when it is not needed. (*Id.*)

A POSITA would have also had a reasonable expectation of success combining the teachings of Barnett and Waters. (*Id.*, ¶68.) As discussed above, both references are in the same field of art. Moreover, Barnett suggests that its system/method is flexible and modifications to the NFC-enabled mobile phone are contemplated. (EX1005, ¶[0044].) A POSITA would have had the skill to implement and reasonable expectation of success in achieving such a modification because it would have involved a combination of known technologies (e.g., known system/method for performing financial transactions using an NFC-enabled mobile phone (Barnett)) according to known methods (e.g., known methods of selectively enabling and disabling NFC tags in mobile phones for use in financial transactions (Waters)) to yield the predictable result of a modified Barnett-Waters system/method

that implements a sensing mechanism in each user's phone to selectively enable and disable the phone's NFC tag such that sensing a value of a physiological parameter and determining that it meets some criterion is required in order to activate the NFC tag used to interact with an NFC reader (e.g., to conduct financial transactions or otherwise transmit/receive information) in the store. (EX1002, ¶68.) *KSR Int'l. Co. Teleflex Inc.*, 550 U.S. 398, 416 (2007).

- v) [1.d] **“wirelessly receiving by the smartphone, using the second air interface, the communications service from the wireless network absent involving the entity, absent providing by the smartphone information to the entity, and absent receiving by the smartphone information from the entity,”**

Barnett discloses this limitation. (EX1002, ¶69.) As discussed for limitation [1.pre], Barnett discloses that the user's smartphone may wirelessly receive, using the phone's cellular communication system, the cellular service from the cellular network (“wirelessly receiving by the smartphone, using the second air interface, the communications service from the wireless network”). (See Section IX.A.1.i.) As further discussed, the phone's receiving of the cellular service does not involve the NFC display 32 (“absent involving the entity”), does not involve the phone providing any information to the NFC display 32 in order to receive the cellular service (“absent providing by the smartphone information to the entity”), and does not involve the phone receiving any information from the NFC display 32 in order to receive the cellular service (“absent receiving by the smartphone information from

the entity”), because the cellular service operates completely independent of the NFC display 32. (*Id.*; EX1002, ¶69.)

vi) [1.e] **“wherein the wireless short-range communications link used by the first air interface is based upon unlicensed frequencies,”**

Barnett discloses this limitation. (EX1002, ¶70.) As an initial matter, the term “unlicensed frequencies” should not be given patentable weight because it is directed to non-functional descriptive material. *See, e.g., Praxair Distrib. v. Mallinckrodt Hosp. Prods. IP*, 890 F.3d 1024, 1032 (Fed. Cir. 2018). In any event, however, a POSITA would have understood that the NFC link used by the NFC system (“wireless short-range communications link used by the first air interface”) would have used unlicensed frequencies (“based upon unlicensed frequencies”), as those were standard features of near field communication. (*See, e.g., EX1006*, 8-9 (describing a mobile terminal that communicates “wirelessly” using a “near field or RFID tag 41” which “operates in [an] unregulated RF band” in which “[n]o licenses are required for the use of the near field devices in this RF band”); EX1002, ¶70.)

vii) [1.f] **“wherein the second air interface uses a wireless communications link that is based upon licensed frequencies, and”**

Barnett discloses this limitation. (EX1002, ¶71.) As an initial matter, the term “licensed frequencies” should not be given patentable weight because it is directed to non-functional descriptive material. *See, e.g., Praxair Distrib.*, 890 F.3d at 1032.

In any event, however, a POSITA would have understood that the cellular communications system (“second air interface”) would have wirelessly connected to the cellular network (“uses a wireless communications link”) using licensed frequencies (“based upon licensed frequencies”), as these were standard features of cellular communication. (*See, e.g.*, EX1025 (1:43-47 (“**Mobile wireless telephony is generally carried out over so-called ‘licensed’ frequencies.** These licensed frequencies refer to frequency bands in the overall spectrum that are regulated by a government entity, for example the Federal Communications Commission in the United States....Typically, mobile telephone communications are carried out over paired (uplink and downlink) frequencies within the licensed band.”); EX1002, ¶71.)

viii) [1.g] “**wherein the first air interface is not involved in providing the communications service to the smartphone.**”

Barnett discloses this limitation. (EX1002, ¶72.) As discussed for limitation [1.pre], the NFC communication system is completely independent from the cellular service and is not involved in providing the cellular service to the consumer’s phone (“wherein the first air interface is not involved in providing the communications service to the smartphone”). (*See* Section IX.A.1.i.)

2. Claim 2

i) [2.pre] “The method of claim 1,”

[2.a] “wherein said wirelessly providing by the smartphone, using the first air interface, information to the entity and wirelessly receiving by the smartphone, using the first air interface, information from the entity independently of, and absent involving the entity in, receiving by the smartphone the communications service from the wireless network using the second air interface is performed over a first time interval;”

[2.b] “wherein said wirelessly receiving by the smartphone, using the second air interface, the communications service from the wireless network absent involving the entity, absent providing by the smartphone information to the entity, and absent receiving by the smartphone information from the entity is performed over a second time interval; and”

[2.c] “wherein the first and second time intervals are non-overlapping with one another.”

Barnett discloses this limitation. (EX1002, ¶¶73-75.)

As discussed for limitation [1.c], Barnett discloses “wirelessly providing by the smartphone, using the first air interface, information to the entity and wirelessly receiving by the smartphone, using the first air interface, information from the entity independently of, and absent involving the entity in, receiving by the smartphone the communications service from the wireless network using the second air interface” because the consumer’s phone may be used to transmit information (e.g., product identity information, retailer identity/location, credit/debit card number,

promotional offers) to the NFC display 32 using NFC, and may be used to receive information (e.g., product information, shopping list, product locations, promotional information, loyalty/credit/debit card configuration information, Wi-Fi configuration information) from the NFC display 32 using NFC. (See Section IX.A.1.iv.) As discussed for limitation [1.pre], this transmission and receipt of information happens while the consumer is shopping in a store (“performed over a first time interval”). (See Section IX.A.1.i; EX1002, ¶73.)

As discussed for limitation [1.d], Barnett discloses “wirelessly receiving by the smartphone, using the second air interface, the communications service from the wireless network absent involving the entity, absent providing by the smartphone information to the entity, and absent receiving by the smartphone information from the entity” because the user’s smartphone may wirelessly receive, using the phone’s cellular communication system, the cellular service from the cellular network, where the cellular service operates completely independently of the NFC display 32 or any communication between the consumer’s phone and the NFC display 32. (See Section IX.A.1.v; EX1002, ¶74.)

Barnett discloses that the consumer’s phone may be operate such that the cellular-enabled phone does not use the cellular service while shopping in the store. (EX1002, ¶75.) In particular, Barnett explains that “[t]he system 10 is adapted to provide information to a consumer’s mobile phone 14 within a store without

requiring the consumer to incur a mobile phone usage charge.” (EX1005, ¶[0016].)

“That is, instead of using the data connection on a cellular carrier, the consumer uses a Wi-Fi network inside the store that has a connection to the Internet.” (*Id.*) A POSITA would have thus understood that Barnett’s system/method allows for a consumer to shop in a store where cellular service is either unavailable (e.g., due to the building’s location, construction, etc.) or turned off by a user (e.g., to prevent mobile phone usage charges), while still allowing the consumer to use their cellular-enabled phone outside of the store. (EX1002, ¶75.) In such a scenario, the consumer may transmit/receive information between the consumer’s phone and the NFC display 32 while shopping in the store (“performed over a first time interval”), and may use the phone to receive cellular service while outside the store (“performed over a second time interval”), and the time inside and outside the store do not overlap (“wherein the first and second time intervals are non-overlapping with one another”). (*Id.*)

3. Claim 4: “The method of claim 1, wherein said detecting by the smartphone that a proximity condition is satisfied between the smartphone and the entity is based, at least in part, on receiving a short-range signal from the entity over the first air interface.”

Barnett discloses this limitation. (EX1002, ¶76.) As discussed for limitation [1.a], in order for transmission/receipt of information between a consumer’s phone and an NFC display 32 to occur, the consumer’s NFC-enabled mobile phone be

brought within proximity of the NFC display 32 in a store (“detecting by the smartphone that a proximity condition is satisfied between the smartphone and the entity”). (See Section IX.A.1.ii.) Indeed, as discussed, Barnett discloses that transmission of data between the phone and the NFC display 32 occurs only when the two devices are within a short distance (e.g., a decimeter). (*Id.*; EX1005, ¶[0013].) A POSITA would have understood that the detection that the proximity condition is satisfied occurs at least in part (e.g., in the payment context, where the mobile phone sends information via NFC to the NFC display 32) based on the mobile phone sensing that the NFC display is emitting a short-range RF signal over the NFC interface (“based, at least in part, on receiving a short-range signal from the entity over the first air interface”). (See, e.g., EX1005, ¶[0014] (explaining that the mobile phone’s NFC tag may act as a “passive tag, allowing a NFC terminal to read the information stored in the mobile phone 14”); EX1006, 9 (“The [near field tag] reader may emit an RF signal to supply power to the [near field] tag to communicate with it if the tag is ‘passive.’”); EX1002, ¶[76].)

4. **Claim 5: “The method of claim 4, wherein said detecting by the smartphone that a proximity condition is satisfied between the smartphone and the entity is based, at least in part, on a measurement of signal strength of the short-range signal.”**

Barnett discloses and/or suggests this limitation. (EX1002, ¶¶[77-79].) As discussed for claim 4, the detection that the proximity condition (e.g., devices within

a decimeter) is satisfied occurs at least in part based on the mobile phone sensing that the NFC display is emitting a short-range RF signal over the NFC interface. (See Section IX.A.3.) A POSITA would have understood that the strength of the RF signal received by a phone would have depended on the proximity between the phone and the NFC display 32. (EX1002, ¶77.) Furthermore, a POSITA would have recognized that a phone would not have been able to detect a signal from the NFC display 32 unless the signal is sufficiently strong (i.e., if the devices are within a sufficiently close distance, e.g., a decimeter). (*Id.*) Thus, a POSITA would have understood that the ability of the phone to detect that it is within sufficient proximity to the NFC display (“wherein said detecting by the smartphone that a proximity condition is satisfied between the smartphone and the entity”) would have been based on whether the phone is able to detect a sufficiently strong signal (“based, at least in part, on a measurement of signal strength of the short-range signal”). (*Id.*)

To the extent Barnett does not explicitly disclose this limitation, a POSITA would have found it obvious to implement the Barnett system/method such that the user’s phone performs a “measurement of signal strength of the short-range signal” in order to determine whether the proximity condition between the phone and NFC display is satisfied. (*Id.*, ¶78.) A POSITA would have understood that testing the strength of an RF signal was known in the art at the time of the alleged invention. (See, e.g., EX1022, 7:50-51 (“testing the strength of the RF signal generated by a

sample NFC communicator”); EX1023, 17:43-55 (describing an NFC communicator with a “signal strength determiner...coupled to the antenna...to capture a sampled measurement of the strength of an incoming RF signal”); EX1024, 5:45-51 (describing NFC device sensors which measure the strength of a generated magnetic field).) A POSITA would have understood that measuring the signal strength of the short-range RF signal would have provided enhanced accuracy and reliability by ensuring that the phone does not proceed with transmitting/receiving information over an NFC connection unless the quality of the connection between the devices is sufficiently strong. (*Id.*) A POSITA would have also recognized that measuring the signal strength would have provided for improved security and efficiency because the risk of a dropped NFC connection in the middle of a transaction would have decreased if a connection is not established unless the measured signal is sufficiently strong. (*Id.*)

A POSITA would have had the skill to implement and reasonable expectation of success in achieving such a modification because it would have involved a combination of known technologies (e.g., known systems/methods for transmitting/receiving information using NFC (Barnett)) according to known methods (e.g., known methods of measuring RF signals generated by NFC devices (state of the art)) to yield the predictable result of a modified Barnett system/method that detects that a proximity condition is satisfied between the phone and NFC

display by measuring whether the RF signal generated by the NFC display is sufficiently strong (“wherein said detecting by the smartphone that a proximity condition is satisfied between the smartphone and the entity is based, at least in part, on a measurement of signal strength of the short-range signal”). (EX1002, ¶79.) *KSR*, 550 U.S. at 416.

5. Claim 6

i) [6.pre] “The method of claim 1,”

[6.a] “wherein a value of the physiological parameter is provided by using a sensor of the smartphone.”

The Barnett-Waters combination discloses and/or suggests this limitation. (EX1002, ¶80.) As discussed for limitation [1.c], in the Barnett-Waters combination, a physiological parameter is sensed (e.g., a fingerprint matches a certain user and the pressure is actively being applied, a resistance sensor and pressure sensor combination detects that a human hand is actively pressing the sensor, or heat from the user’s hand is actively being applied) by a phone sensor (e.g., fingerprint/pressure sensor, skin resistance/pressure sensor, or heat sensor) (“wherein a value of the physiological parameter is provided by using a sensor of the smartphone”) in order to determine whether the value of the parameter satisfies a certain criterion, thereby enabling the NFC tag. (*See* Section IX.A.1.iv.)

6. Claim 7

- i) [7.pre] “The method of claim 1, wherein said wirelessly providing by the smartphone, using the first air interface, information to the entity comprises:”

[7.a] “being proximate to a specific location within a store, then detecting a short-range signal being transmitted from said specific location within the store, and then performing a transaction to pay for one or more items.”

Barnett discloses this limitation. (EX1002, ¶81.) As discussed for limitation [1.pre], Barnett’s system/method involves the consumer’s phone wirelessly providing various information (e.g., product identity information, retailer identity/location, credit/debit card number, promotional offers), via NFC, to an NFC display 32 in a store (“wirelessly providing by the smartphone, using the first air interface, information to the entity”). (See Section IX.A.1.i.) As discussed for limitations [1.pre]-[1.a], this information is provided (e.g., to complete a transaction) when a consumer first brings the phone within a certain proximity of an NFC display 32 within the store (“being proximate to a specific location within a store”). (See Sections IX.A.1.i-ii.) As discussed for claim 4, the consumer’s phone detects that the proximity condition is satisfied by detecting a short-range RF signal transmitted from the NFC display 32 (“then detecting a short-range signal being transmitted from said specific location within the store”). (See Section IX.A.3.) As discussed for limitation [1.pre], Barnett explains that by bringing the consumer’s phone in

proximity to an NFC display 32, the phone may be used to purchase items in a store and complete the transaction (“and then performing a transaction to pay for one or more items”) by providing credit/debit card information via NFC to the NFC display 32. (See Section IX.A.1.i.)

7. Claim 8

i) [8.pre] “The method of claim 1,”

[8.a] “wherein the entity comprises a check-out counter in a store, and”

Barnett discloses this limitation. (EX1002, ¶82.) As an initial matter, the term “check-out counter in a store” should not be given patentable weight because it is directed to non-functional descriptive material. See, e.g., *Praxair Distrib.*, 890 F.3d at 1032. In any event, as discussed for limitation [1.pre], the NFC display 32 (“entity”) may function as an NFC-enabled payment register in a store for completing a purchase (“comprises a check-out counter in a store”). (See Section IX.A.1.i; EX1005, ¶¶[0037], [0040].)

ii) [8.b] “wherein said wirelessly providing by the smartphone, using the first air interface, information to the entity comprises:”

(1) [8.b.i] “performing a financial transaction to pay for one or more items.”

Barnett discloses these limitations. (EX1002, ¶83.) As discussed for limitation [1.pre], Barnett explains that a consumer’s phone may be used to purchase items in a store and complete the transaction (“performing a financial transaction to

pay for one or more items”) at a NFC display 32 by providing credit/debit card information via NFC to the NFC display 32 (“wherein said wirelessly providing by the smartphone, using the first air interface, information to the entity comprises: performing a financial transaction to pay for one or more items”). (See Section IX.A.1.i.)

8. Claim 9: “The method of claim 1, wherein establishing the wireless short-range communications link between the smartphone and the entity is performed in response to the physiological parameter.”

The Barnett-Waters combination discloses and/or suggests this limitation. (EX1002, ¶84.) As discussed for limitation [1.b], the NFC link established between the consumer’s phone and the NFC display 32 is a “wireless short-range communications link between the smartphone and entity.” (See Section IX.A.1.iii.) As discussed for limitation [1.c], in the Barnett-Waters combination, the NFC link is only established if a physiological parameter is sensed and meets some criterion (e.g., a fingerprint matches a certain user and the pressure is actively being applied, a resistance sensor and pressure sensor combination detects that a human hand is actively pressing the sensor, or heat from the user’s hand is actively being applied) (“in response to the physiological parameter”), thereby enabling the near field tag while the value of the parameter meets the criterion. (See Section IX.A.1.iv; EX1002, ¶84.)

9. Claim 10

i) [10.pre] “A system comprising:”

To the extent the preamble is limiting, Barnett discloses the limitations therein. (EX1002, ¶85.) As discussed for limitation [1.pre], Barnett discloses a “system” of devices interacting within a store shopping experience, including features for allowing a consumer’s mobile phone to interact with various NFC-enabled product identifiers 34 and NFC displays 32 to transmit/receive information about products and conduct financial transactions. (*See* Section IX.A.1.i.)

ii) [10.a] “a smartphone that is configured to perform operations comprising:”

Barnett discloses this limitation. (EX1002, ¶86.) As discussed for limitation [1.pre], Barnett discloses a mobile phone (“smartphone”) with “smart” features to perform the functions of a Wi-Fi device, a contact-less credit/debit card, and a cell phone. (*See* Section IX.A.1.i.) As further discussed for limitation [1.pre], the phone (“smartphone”) is configured such that, in response to a consumer bringing the phone within a short distance of the NFC interface of the NFC-enabled display 32, the phone performs operations to transmit and receive information between the phone and NFC display (“configured to perform operations”), including the operations recited in the limitations below. (*Id.*; *see also infra* Sections IX.A.9.iii-ix.)

- iii) **[10.b] “detecting by the smartphone that a proximity condition is satisfied between the smartphone and an entity;”**

Barnett discloses this limitation for the same reasons as discussed for limitation [1.a]. (EX1002, ¶87; *see* Section IX.A.1.ii.)

- iv) **[10.c] “in response to at least the proximity condition having been satisfied between the smartphone and the entity, establishing a wireless short-range communications link between the smartphone and the entity to provide by the smartphone, using a first air interface, information to the entity and to receive by the smartphone information from the entity;”**

Barnett discloses this limitation for the same reasons as discussed for limitation [1.b]. (EX1002, ¶88; *see* Section IX.A.1.iii.)

- v) **[10.d] “in response to at least the proximity condition having been satisfied between the smartphone and the entity and in response to a physiological parameter, wirelessly providing, using the first air interface, information to the entity and wirelessly receiving, using the first air interface, information from the entity independently of, and absent involving the entity in, receiving a communications service from a wireless network using a second air interface that differs from the first air interface; and”**

The Barnett-Waters combination discloses and/or suggests this limitation for the same reasons as discussed for limitation [1.c]. (EX1002, ¶89; *see* Section IX.A.1.iv.)

- vi) **[10.e] “wirelessly receiving, using the second air interface, the communications service from the wireless network absent involving the entity, absent providing information to the entity, and absent receiving information from the entity,”**

Barnett discloses this limitation for the same reasons as discussed for limitation [1.d]. (EX1002, ¶90; *see* Section IX.A.1.v.)

- vii) **[10.f] “wherein the wireless short-range communications link used by the first air interface is based upon unlicensed frequencies,”**

Barnett discloses this limitation for the same reasons as discussed for limitation [1.e]. (EX1002, ¶91; *see* Section IX.A.1.vi.)

- viii) **[10.g] “wherein the second air interface uses a wireless communications link that is based upon licensed frequencies, and”**

Barnett discloses this limitation for the same reasons as discussed for limitation [1.f]. (EX1002, ¶92; *see* Section IX.A.1.vii.)

- ix) **[10.h] “wherein the first air interface is not involved in providing the communications service to the smartphone.”**

Barnett discloses this limitation for the same reasons as discussed for limitation [1.g]. (EX1002, ¶93; *see* Section IX.A.1.vii.)

10. Claim 11: “The system according to claim 10, further comprising the entity.”

Barnett discloses this limitation. (EX1002, ¶94.) As discussed for limitation [10.pre], Barnett’s system for shopping with a mobile phone in a store comprises the

NFC display 32 (“further comprising the entity”). (See Section IX.A.9.i; *see also generally* Sections IX.A.9.i-ix.)

11. Claim 12

i) [12.pre] “The system of claim 10,”

[12.a] “wherein said wirelessly providing, using a first air interface, information to an entity and wirelessly receiving, using the first air interface, information from the entity independently of, and absent involving the entity in, receiving a communications service from a wireless network using a second air interface that differs from the first air interface is performed over a first time interval;”

[12.b] “wherein said wirelessly receiving, using the second air interface, the communications service from the wireless network absent involving the entity, absent providing information to the entity, and absent receiving information from the entity is performed over a second time interval; and”

[12.c] “wherein the first and second time intervals are non-overlapping with one another.”

Barnett discloses these limitations for the same reasons as discussed for limitations [2.pre]-[2.c]. (EX1002, ¶95; *see* Section IX.A.2.i.)

12. Claim 14: “The system of claim 10, wherein said detecting by the smartphone that a proximity condition is satisfied between the smartphone and an entity is based, at least in part, on receiving a short-range signal from the entity over the first air interface.”

Barnett discloses this limitation for the same reasons as discussed for claim 4. (EX1002, ¶96; *see* Section IX.A.3.)

13. **Claim 15: “The system of claim 14, wherein said detecting by the smartphone that a proximity condition is satisfied between the smartphone and an entity is based, at least in part, on a measurement of signal strength of the short-range signal.”**

Barnett discloses this limitation for the same reasons as discussed for claim 5.

(EX1002, ¶97; *see* Section IX.A.4.)

14. Claim 16

- i) [16.pre] **“The system of claim 10,”**

[16.a] “wherein a value of the physiological parameter is provided by using a sensor of the smartphone.”

The Barnett-Waters combination discloses and/or suggests these limitations for the same reasons as discussed for limitations [6.pre]-[6.a]. (EX1002, ¶98; *see* Section IX.A.5.i.)

15. Claim 17

- i) [17.pre] **“The system of claim 10, wherein said wirelessly providing, using the first air interface, information to the entity comprises:”**

[17.a] “being proximate to a specific location within a store, then detecting a short-range signal being transmitted from said specific location within the store, and then performing a transaction to pay for one or more items.”

Barnett discloses these limitations for the same reasons as discussed for limitations [7.pre]-[7.a]. (EX1002, ¶99; *see* Section IX.A.6.i.)

16. Claim 18

i) [18.pre] “The system of claim 10,”

[18.a] “wherein the entity comprises a check-out counter in a store, and”

Barnett discloses these limitations for the same reasons as discussed for limitations [8.pre]-[8.a]. (EX1002, ¶100; *see* Section IX.A.7.i.)

ii) [18.b] “wherein said wirelessly providing, using the first air interface, information to the entity comprises:”

(1) [18.b.i] “performing a financial transaction to pay for one or more items.”

Barnett discloses these limitations for the same reasons as discussed for limitations [8.b]-[8.b.i]. (EX1002, ¶101; *see* Sections IX.A.7.ii-ii.(1).)

17. Claim 19: “The system of claim 10, wherein establishing the wireless short-range communications link between the smartphone and the entity is performed in response to the physiological parameter.”

The Barnett-Waters combination discloses and/or suggests this limitation for the same reasons as discussed for claim 9. (EX1002, ¶102; *see* Section IX.A.8.)

B. Ground 2: Barnett, Waters, and Wang Render Obvious Claims 3 and 13

1. Claim 3

i) [3.pre] “The method of claim 1,”

[3.a] “wherein the wireless short-range communications link that is based upon unlicensed frequencies is further based upon a Time Division Duplex (TDD) protocol, and”

The Barnett-Waters combination discloses and/or suggests these limitations.

(EX1002, ¶¶103-105.)

As discussed for limitation [1.e], Barnett’s NFC communication uses unlicensed frequencies. (*See* Section IX.A.1.vi.) While NFC communication does not use unlicensed frequencies based upon a Time Division Duplex protocol, a POSITA would have further been motivated to implement the Barnett-Waters system/method in view of Barnett such that the communication between a consumer’s mobile phone and the point-of-sale terminal/payment register display occurs via Bluetooth instead of NFC. (EX1002, ¶103.) A POSITA would have understood that Bluetooth provides a “wireless short-range communications link that is based upon unlicensed frequencies [and] is further based upon a Time Division Duplex (TDD) protocol” as these were standard features of Bluetooth communication. (EX1005, ¶[0017] (“Bluetooth is an industrial specification for **wireless** personal area networks (PANs). Bluetooth provides a way to connect and

exchange information between devices...over a secure, **globally unlicensed short-range radio frequency.**”); EX1008, 48:5-6 (“Bluetooth technology provides the effect of full duplex transmission through the use of a **Time-Division Duplex (TDD) scheme.**”); EX1002, ¶103.)⁵

In particular, Barnett explains that a consumer’s mobile phone may also be “adapted to communicate with...a Bluetooth system” in addition to NFC. (EX1005, ¶[0012].) Barnett discloses that instead of the displays 32 (used as point-of-sale terminals) being NFC-enabled displays, “[a]lternatively, the displays 32 may be Bluetooth-enabled communications devices” such that “when a Bluetooth-enabled mobile phone is located near the display 32, information is transmitted between the Bluetooth-enabled mobile phone 14 and the display 32.” (*Id.*, ¶[0022]; EX1002, ¶104.) Barnett discloses that Bluetooth is beneficial because it “provide[s] low-rate mesh networking, allowing low-cost devices to form networks within the retail environment.” (EX1005, ¶[0017].) A POSITA would have thus been motivated to consider Bluetooth instead of or in addition to NFC when implementing the communication features between a mobile phone and point-of-sale terminal in the Barnett-Waters system/method. (EX1002, ¶104.) A POSITA would have also

⁵ As noted above for claim limitation [1.e], the term “unlicensed frequencies” should also not receive patentable weight. (*See* Section IX.A.1.vi.)

understood that Bluetooth would have been beneficial in stores where a longer communication range is desired (e.g., up to 10 meters), or where faster data transfer speeds are desired. (*Id.*)

A POSITA would have also had a reasonable expectation of success in implementing the Barnett-Waters system/method in view of Barnett in this manner because it would have involved an implementation that Barnett already suggests is feasible—using Bluetooth instead of NFC to perform transactions using mobile phones at point-of-sale terminals. (*Id.*, ¶105.) A POSITA would have had the skill to implement and reasonable expectation of success in achieving such a modification because it would have involved a combination of known technologies (e.g., known systems/methods for performing financial transactions using an NFC- or chip-enabled mobile phone (Barnett, Waters)) according to known methods (e.g., known methods of using Bluetooth instead of NFC for mobile phone transactions at point-of-sale terminals (Barnett)) to yield the predictable result of a modified Barnett-Waters system/method that further uses Bluetooth (which is a “wireless short-range communications link that is based upon unlicensed frequencies [and] is further based upon a Time Division Duplex (TDD) protocol,” as discussed above) communication instead of NFC. (EX1002, ¶105.) *KSR*, 550 U.S. at 416.

- ii) **[3.b] “wherein the second air interface that uses a wireless communications link that is based upon licensed frequencies is further based upon an Orthogonal Frequency Division Multiplexed (OFDM) and/or Orthogonal Frequency Division Multiple Access (OFDMA) protocol.”**

Barnett in view of Waters and Wang discloses and/or suggests this limitation.

(EX1002, ¶¶106-111.)

As discussed for limitation [1.f], Barnett discloses that the consumer phone’s cellular communication system is a “second air interface that uses a wireless communications link that is based upon licensed frequencies.” (See Section IX.A.1.vii.) While neither Barnett nor Waters explicitly discloses that the cellular communication system is “further based upon an Orthogonal Frequency Division Multiplexed (OFDM) and/or Orthogonal Frequency Division Multiple Access (OFDMA) protocol,” a POSITA would have been motivated and found it obvious to further modify the Barnett-Waters system/method in view of Wang to implement this feature. (EX1002, ¶106.)

Like Barnett and Waters, Wang discloses methods compatible with cellular networking. (*Id.*, ¶107; *see also id.*, ¶¶37-39.) Wang discloses a “method for assigning frequency spectrum bandwidth of a communication system” (EX1026, ¶[0001]), where the method is compatible with “wireless data transmission” (*id.*, ¶[0002]) such as “cellular networking” (*id.*, ¶¶[0006], [0011]). Thus, Wang is similar to Barnett, which as discussed for limitation [1.pre], discloses a method for

using a mobile phone as a contact-less credit card, where the phone is also adapted to operate as a cell phone, using a cellular communication system to connect to a cellular network. (*See* Section IX.A.1.i.) Wang is also similar to Waters, which discloses that its mobile terminal may be “registered with...[a] cellular telecommunications network.” (EX1006, 4.) A POSITA would have therefore been motivated to consider the teachings of Wang when implementing the cellular communication system of the Barnett-Waters system/method. (EX1002, ¶107.)

Wang specifically “relates to a method for assigning frequency spectrum bandwidth of a communication system, and especially relates to a method for assigning frequency spectrum bandwidth of an OFDM (Orthogonal Frequency Division Multiplexing) and OFDMA (Orthogonal Frequency Division Multiplexing Access) coexistence system.” (EX1026, ¶[0001].) Wang explains that OFDM technology is “suitable for wireless data transmission, so it has been used widely as a wireless access method” since the 1960s, and is beneficial because “the modulating mode has very high frequency spectrum utilization efficiency.” (*Id.*, ¶[0002].) In particular, an “OFDM system adopts multi-carrier technique,” where “[o]rthogonality exists among the sub-carriers of the OFDM system, which permits mutual overlap of the frequency spectrum of each sub-carrier, and therefore, compared with the conventional frequency division multiplexing system, the OFDM system could maximize the use of frequency spectrum resources.” (*Id.*, ¶[0003].)

Wang explains that OFDMA is similar to OFDM, but “the bandwidth assignment of the OFDMA system is carried out in the two-dimensional interval of time and frequency, and the bandwidth of the OFDM system is only assigned on time dimension.” (*Id.*, ¶[0006].) “Compared with the conventional OFDM system, the bandwidth assignment of the OFDMA system is more flexible and suitable for use in cellular networking, so it is attracting people’s attention more and more.” (*Id.*) Wang explains that these differences in bandwidth assignment can result in a low utilization rate of frequency spectrum in a combined system, and thus discloses an improved OFDM and OFDMA coexistence system featuring an efficient method for assigning the frequency spectrum bandwidth of the system in order to improve the utilization efficiency of the frequency spectrum. (*Id.*, ¶¶[0007]-[0013]; EX1002, ¶108.)

Because Barnett, Waters, and Wang each describe features (e.g., cellular networking) that are reasonably pertinent to a problem the ’199 patent purports to address (e.g., integration of cellular communication systems in a multi-function mobile phone), Barnett, Waters, and Wang are all analogous art. (EX1002, ¶109.) Thus, a POSITA would have looked to Wang when considering and implementing Barnett-Waters system/method. (*Id.*)

In particular, a POSITA would have been motivated to implement Barnett’s cellular communication system such that it implements an OFDM and OFDMA

coexistence protocol, similar to that disclosed by Wang. (EX1002, ¶110.) A POSITA would have been motivated to implement OFDM/OFDMA in order to improve frequency spectrum utilization efficiency and maximize the use of frequency spectrum resources, as discussed above. (*Id.*; EX1026, ¶¶[0002]-[0003].) A POSITA would have recognized the benefits of also implementing OFDMA protocol in addition to OFDM protocol to provide a more flexible and suitable method of bandwidth assignment for cellular networking (like that disclosed by Barnett), and to increase compatibility by supporting both OFDM and OFDMA techniques at the same time, thus providing greater flexibility in implementation. (EX1026, ¶¶[0006]-[0007]; EX1002, ¶110.) A POSITA would have recognized that improving the cellular communication system features in the Barnett-Waters system/method, such as by implementing an OFDM/OFDMA protocol, would have also improved the overall efficiency, reliability, and performance of the consumer's mobile phone by improving one of the primary communication methods (cellular communication) available to the consumer. (EX1002, ¶110.)

A POSITA would have had the skill to implement and reasonable expectation of success in achieving such a modification because it would have involved a combination of known technologies (e.g., known system/method for performing integrating a cellular communication system in a mobile phone (Barnett, Waters)) according to known methods (e.g., known methods of improving cellular networking

using OFDM/OFMDA protocol (Wang)) to yield the predictable result of a modified Barnett-Waters system/method that further uses an OFDM/OFDMA protocol for the cellular communication system (“wherein the second air interface...is further based upon an Orthogonal Frequency Division Multiplexed (OFDM) and/or Orthogonal Frequency Division Multiple Access (OFDMA) protocol”). (EX1002, ¶111.) *KSR*, 550 U.S. at 416.

2. **Claim 13: “The system of claim 10, wherein the second air interface is based upon an Orthogonal Frequency Division Multiplexed (OFDM) and/or Orthogonal Frequency Division Multiple Access (OFDMA) protocol.”**

The Barnett-Waters-Wang combination discloses and/or suggests this limitation for the same reasons as discussed for limitation [3.b]. (EX1002, ¶112; *see* Section IX.B.1.ii.)

C. Ground 3: Barnett, Waters, and Sakamoto Render Obvious Claims 5 and 15

1. **Claim 5: “The method of claim 4, wherein said detecting by the smartphone that a proximity condition is satisfied between the smartphone and the entity is based, at least in part, on a measurement of signal strength of the short-range signal.”**

Barnett in view of Waters and Sakamoto discloses and/or suggests this limitation. (EX1002, ¶¶113-121.)

As discussed for claim 5 under Ground 1, the Barnett-Waters combination renders obvious “detecting by the smartphone that a proximity condition is satisfied

between the smartphone and the entity is based, at least in part, on a measurement of signal strength of the short-range signal,” as set forth in claim 5. (See Section IX.A.4.) Assuming a scenario where the Barnett-Waters combination does not render obvious claim 5, a POSITA would have been motivated and found it obvious to further modify the Barnett-Waters system/method in view of Sakamoto to implement the feature set forth in claim 5. (EX1002, ¶114.)

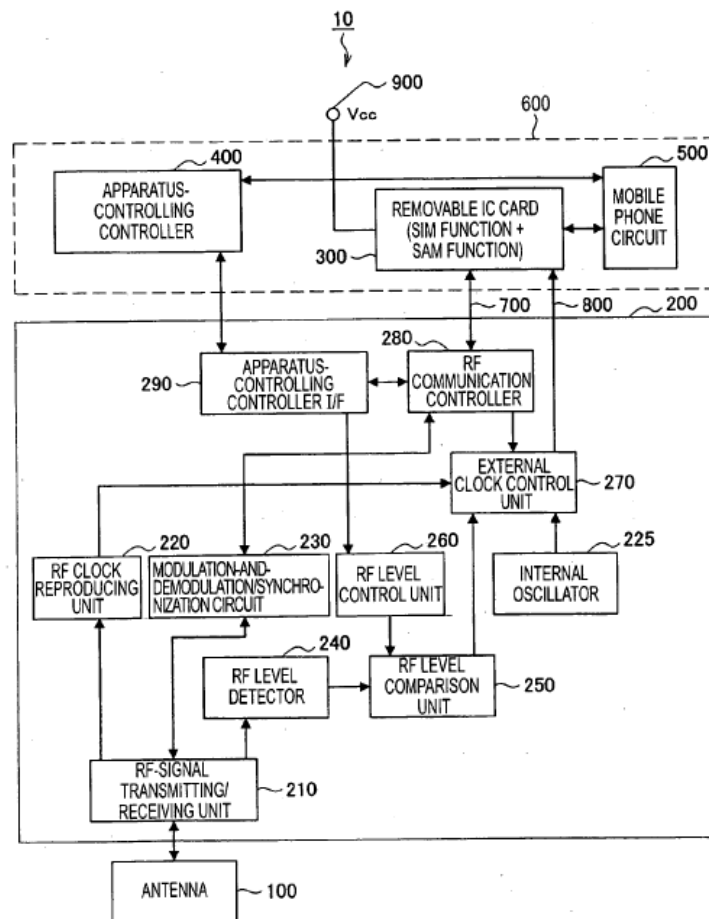
Like Barnett and Waters, Sakamoto discloses systems and methods related to performing transactions using NFC. (*Id.*, ¶115.) Sakamoto discloses “a mobile radio communication device in which an NFC IC card (e.g., a SAM card) is connected to a mobile terminal, including a mobile phone having an IC card such as a SIM card, USIM card, or a flash memory card, the mode of the IC card is automatically initialized after radio communication (NFC communication) with another NFC-equipped apparatus is executed.” (EX1029, ¶[0010]; *see also id.*, ¶¶[0003]-[0004], [0005] (“As described above, the incorporation of the NFC function into radio communication mobile terminals, such as mobile phones and PDAs, can provide communication means that can access network content for payment using credit cards and so on, tickets, and games through a simple operation, i.e., only bringing the NFC-equipped apparatus close.”), [0049]; EX1002, ¶¶40-44.) Thus, Sakamoto is similar to Barnett, which as discussed for limitation [1.pre], discloses a method for using a mobile phone as a contact-less credit card, where the phone is also

adapted to operate as a cell phone. (*See* Sections IX.A.1.i-ii.) Sakamoto is also similar to Waters, which discloses that the near field tag of its mobile terminal may be used to conduct various transactions, such as paying for public transport, making a toll fee payment, or paying for a school lunch. (*See* Section IX.A.1.iv.) A POSITA would have therefore been motivated to consider the teachings of Sakamoto when implementing the proposed Barnett-Waters system/method. (EX1002, ¶115.)

Sakamoto specifically discloses an NFC-enabled mobile phone with an NFC circuit that includes a signal strength determining means, which is used to measure whether the signal from another nearby NFC-enabled device is strong enough to allow communication between the two NFC-enabled devices. (EX1002, ¶116.) For example, Sakamoto discloses with reference to Figure 2 (reproduced below) that “the circuit configuration of the NFC-equipped apparatus...includes an NFC-side circuit, which is constituted by an antenna 100 and an NFC circuit (an NFC chip) 200, and a mobile-phone-side circuit 600, which is constituted by a removable IC card 300, an apparatus-controlling controller 400, and a mobile phone circuit 500.” (EX1029, ¶[0052], FIG. 2; *see also id.*, ¶¶[0047] (“FIG. 1 is a schematic view showing the configuration of an NFC-function-equipped mobile phone (mobile radio communication device) according to a first embodiment.”), [0048].) Sakamoto discloses that “[t]he NFC circuit 200 includes an RF-signal (radio-signal) transmitting/receiving unit 210, an RF-clock reproducing unit 220, a modulation-

and-demodulation/synchronization circuit 230, an RF-level detector 240, an RF-level comparison unit (radio-signal strength determining means) 250, an RF level controller (radio-signal strength threshold-value setting means) 260, an external clock control unit 270, an RF communication controller 280, an apparatus-controlling controller I/F (interface) 290, and so on.” (*Id.*, ¶[0054].)

FIG. 2



(*Id.*, FIG. 2; EX1002, ¶116.)

Sakamoto discloses measuring the strength of an RF signal received at antenna 100 from another nearby NFC-enabled device using the RF-level detector 240 and RF-level comparison unit (radio-signal strength determining means) 250 to determine whether the two devices are “in close proximity...(e.g., in a near distance in the range of, for example, 10 to 20 cm).” (EX1029, ¶[0049].) Sakamoto does this by determining whether the measured signal strength is over a certain threshold. (EX1029, ¶¶[0056]-[0058], [0060], [0075].) For example, Sakamoto discloses that “[t]he RF-level detector 240 is a circuit for converting (averaging) the RF signals, received from the antenna 100 and the RF-signal transmitting/receiving unit 210, into DC-level signals and for outputting the signals to the RF-level comparison unit 250.” (*Id.*, ¶[0056].) “The RF-level comparison unit 250 is a circuit for comparing an **RF-signal-strength threshold value** set by the RF-level control unit 260 with a present RF level value sent from the RF-level detector 240 and for outputting a signal indicating which of the values is larger or smaller to the external clock control unit 270,” where “[t]he **RF signal strength can be, for example, the voltage value of radio signals.**” (*Id.*; EX1002, ¶117.)

Based on this comparison of signal strength, the “NFC circuit 200...**determine[s] the presence/absence of RF signal communication (radio signal communication) with another NFC-equipped apparatus.**” (EX1029, ¶[0060].) If the measured signal strength is higher than the threshold value (“based,

at least in part, on a measurement of signal strength of the short-range signal”), RF communication between the mobile phone and the nearby apparatus is allowed (“wherein said detecting by the smartphone that a proximity condition is satisfied between the smartphone and the entity”). (*Id.*, ¶[0075] (“That is, **when the present RF signal strength is higher than the RF-level setting value (the threshold value), data communication with the removable IC card 300 is executed as shown in FIG. 10A.**”), FIG. 10A; *see also id.*, ¶¶[0009]-[0011], [0057] (“That is, **when the present strength of the RF signals received by the antenna 100 and the RF-signal transmitting/receiving unit 210 is higher than an RF level setting value (an RF-signal-strength threshold value), control is executed so as to supply the clock signal to the removable IC card 300.**”), [0058], [0060].) Otherwise, communication between the two devices is stopped or not allowed. (*Id.*, ¶¶[0075] (“On the other hand, when the present RF signal strength is lower than the RF-level setting value, the level of the data line to the removable IC card 300 is fixed to the Hi level (see FIG. 10B) or the Low level (see FIG. 10C). As a result, for example, data generated by noise or the like is prevented from being transmitted to the removable IC card 300.”), [0057]-[0058], [0060]; EX1002, ¶118.)

Therefore, Sakamoto discloses detecting whether a proximity condition between its NFC-enabled mobile phone and nearby NFC-enabled apparatus is met (“wherein said detecting by the smartphone that a proximity condition is satisfied

between the smartphone and the entity”) based on measuring whether the strength of a received RF signal from the nearby apparatus is above or below a certain threshold (“based, at least in part, on a measurement of signal strength of the short-range signal”), as set forth in claim 5. (EX1002, ¶119.)

A POSITA would have been motivated to incorporate such a mechanism as taught by Sakamoto in the Barnett-Waters system/method for detecting the proximity condition between the NFC-enabled mobile phone and the NFC-enabled display 32, to avoid situations where the communication may be initiated without a sufficiently strong signal. (*See, e.g.*, EX1029, ¶¶[0075] (describing that because the strength of the signal is taken into account before allowing communication between the devices, **“data generated by noise or the like is prevented from being transmitted to the removable IC card 300.”**), [0012] (similar).) Moreover, a POSITA would have understood a further advantage of the proposed modification would have been that by discontinuing communication with a device from which a strong signal is not detected, this would free up the mobile phone to communicate with other nearby NFC-enabled devices. (*Id.*, ¶[0076] (“With this arrangement, after the completion of NFC radio communication, **the mobile radio communication device can be automatically put into a state that allows radio communication with another NFC-equipped apparatus.**”); *see also id.*, ¶[0067] (“With this arrangement, when the NFC-equipped apparatus finishes communication (e.g.,

when the NFC-equipped apparatus is away from a distance that allows radio communication), the SAM function area of the removable IC card is automatically initialized, so that the removable IC card is automatically put into a state that allows communication with another NFC-equipped apparatus.”).) Indeed, as discussed above with respect to the Barnett-Waters combination under Ground 1, a POSITA would have understood that measuring the signal strength of the short-range RF signal (and ensuring a sufficiently strong signal as taught by Sakamoto) would have provided enhanced accuracy and reliability by ensuring that the phone does not proceed with transmitting/receiving information over an NFC connection unless the quality of the connection between the devices is sufficiently strong. (*See* Section IX.A.4.) As also further discussed above, a POSITA would have also recognized that measuring the signal strength (as taught by Sakamoto) would have provided for improved security and efficiency because the risk of a dropped NFC connection in the middle of a transaction would have decreased if a connection is not established unless the measured signal is sufficiently strong. (EX1002, ¶120.)

A POSITA would have had the skill to implement and reasonable expectation of success in achieving such a modification because it would have involved a combination of known technologies (e.g., known systems/methods for transmitting/receiving information using NFC (Barnett)) according to known methods (e.g., known methods of measuring RF signals and comparing them to a

threshold value to ensure the proximity between devices will lead to a stable connection (Sakamoto)) to yield the predictable result of a modified Barnett-Waters-Sakamoto system/method that detects that a proximity condition is satisfied between the phone and NFC display by measuring whether the RF signal generated by the NFC display is sufficiently strong (“wherein said detecting by the smartphone that a proximity condition is satisfied between the smartphone and the entity is based, at least in part, on a measurement of signal strength of the short-range signal”).

(EX1002, ¶121.) *KSR*, 550 U.S. at 416.

2. **Claim 15: “The system of claim 14, wherein said detecting by the smartphone that a proximity condition is satisfied between the smartphone and an entity is based, at least in part, on a measurement of signal strength of the short-range signal.”**

The Barnett-Waters-Sakamoto combination discloses and/or suggests this limitation for the same reasons as discussed for claim 5. (EX1002, ¶122; *see* Section IX.C.1.)

X. DISCRETIONARY DENIAL IS NOT APPROPRIATE

In view of the Patent Office’s interim process regarding discretionary denial, Petitioner will substantively address this issue during discretionary denial briefing.

XI. CONCLUSION

Petitioner requests institution of IPR for claims 1-19 of the '199 patent based on the grounds specified in this petition.

Respectfully submitted,

Dated: August 13, 2025

By: /Naveen Modi/
Naveen Modi (Reg. No. 46,224)
Counsel for Petitioner

CERTIFICATE OF COMPLIANCE

Pursuant to 37 C.F.R. § 42.24(d), the undersigned certifies that the foregoing Petition for *Inter Partes* Review of U.S. Patent No. 10,219,199 contains, as measured by the word-processing system used to prepare this paper, 12,531 words. This word count does not include the items excluded by 37 C.F.R. § 42.24 as not counting towards the word limit.

Respectfully submitted,

Dated: August 13, 2025

By: /Naveen Modi/
Naveen Modi (Reg. No. 46,224)
Counsel for Petitioner

CERTIFICATE OF SERVICE

I hereby certify that on August 13, 2025, I caused a true and correct copy of the foregoing Petition for *Inter Partes* Review of U.S. Patent No. 10,219,199 and supporting exhibits to be served via express mail on the Patent Owner at the following correspondence address of record as listed on Patent Center:

Carlson, Caspers, Vandenburg & Lindquist, P.A.
225 S. Sixth St.
Ste. 4200
Minneapolis, MN 55402
United States

By: /Naveen Modi/
Naveen Modi (Reg. No. 46,224)