IN THE UNITED STATES DISTRICT COURT
FOR THE EASTERN DISTRICT OF TEXAS
MARSHALL DIVISION

ICASHE, INC., Plaintiff, v. SAMSUNG ELECTRONICS CO., LTD., and SAMSUNG ELECTRONICS AMERICA, INC., Defendants.	Civil Action No. 2:24-cv-00429-JRG **JURY TRIAL DEMANDED**

DEFENDANTS SAMSUNG ELECTRONICS CO. LTD. AND SAMSUNG ELECTRONICS AMERICA, INC.'S INVALIDITY CONTENTIONS

Pursuant to the Court's Docket Control Order (Dkt. No. 30) and Discovery Order (Dkt. 31) and Eastern District of Texas Local Patent Rules 3-3 and 3-4, Defendants Samsung Electronics Co. Ltd., and Samsung Electronics America, Inc. ("Samsung") hereby disclose their Invalidity Contentions. Samsung contends that each of the claims asserted by Plaintiff iCashe, Inc. ("iCashe") is invalid under at least 35 U.S.C. §§ 102, 103, and/or 112, for at least the reasons set forth herein.

I. RESERVATION OF RIGHTS AND OBJECTIONS

A. Asserted Claims

Plaintiff iCashe, Inc.'s Disclosure of Asserted Claims and Infringement Contentions Under Patent Rules 3-1 and 3-2, dated September 4, 2024, identify the following Asserted Claims from the Asserted Patents listed below:

Asserted Patents (U.S. Patent No.)	Asserted Claims
9,122,965 ("the '965 patent")	1-20
9,483,722 ("the '722 patent")	1-14
11,694,053 ("the '053 patent")	1-8, 17-20
8,403,219 ("the '219 patent")	1-6
9,202,156 ("the '156 patent")	1-5, 8-12
9,208,423 ("the '423 patent")	1-5, 8-18
11,270,174 ("the '174 patent")	1-9

B. General Reservation of Rights

These Invalidity Contentions, along with the information and documents that Samsung produces herewith, are provisional in nature and subject to further revision or supplementation. Consistent with the Patent Rules, Samsung reserves the right to amend these contentions should iCashe: (1) provide any information that it failed to properly provide in its preliminary infringement contentions; (2) amend its preliminary infringement contentions; (3) produce documents evidencing conception and reduction to practice that it failed to produce; or (4) attempt to rely upon any information during claim construction proceedings, at trial, in a hearing, or during a deposition that it failed to provide in its infringement contentions. Samsung further reserves the right to amend these contentions in light of the Court's claim construction rulings or based on further discovery or Court rulings. Ongoing Investigation

Discovery in this case has just begun; and Samsung's investigations are continuing. Samsung expressly reserves the right to amend or supplement these disclosures based on additional information obtained through continued formal discovery or other means pursuant to Fed. R. Civ.

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P. 26(e). Discovery is ongoing, and Samsung has not yet completed its search for and analysis of relevant prior art and other information, some of which is in the possession of third parties.

Samsung further reserves the right to revise, amend, or supplement the information provided herein, including by identifying, charting, and relying on additional information, references, systems, and devices, should Samsung's further search and analysis yield such additional information, references, systems, or devices, consistent with the Docket Control Order, Discovery Order, Local Rules of this Court, and the Federal Rules of Civil Procedure. In addition, Samsung reserves the right to supplement or amend the positions taken and information disclosed in these Preliminary Invalidity Contentions, including without limitation, the prior art and grounds of invalidity set forth herein under 35 U.S.C. §§ 102, 103 or 112, to consider information or defenses that may come to light because of Samsung's discovery efforts; additional information obtained as to the priority date(s) of the asserted claims; testimony or documents produced by a party or non-party; and positions that iCashe might take or amend concerning infringement or invalidity issues. For example, Samsung may seek further discovery from third parties believed to have knowledge, documentation, or corroborating evidence concerning items of prior art, including prior art listed in the Exhibits hereto. Such third parties may include, without limitation, the authors, inventors, assignees, owners, or developers of the references and technologies listed in these disclosures. Moreover, Samsung reserves the right to assert invalidity under 35 U.S.C. §§ 102(c), (d), (f), or (g) to the extent that discovery or further investigation yields information forming the basis for such grounds for invalidity.

Samsung further reserves the right to rely upon prior art cited in the file histories of the Asserted Patents and related U.S. and foreign patent applications as invalidating references or to

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show the state of the art. Samsung further reserves the right to rely upon additional prior art to show the state of the art.

C. Claim Construction

Claim construction exchanges for this action have not yet occurred. Accordingly, Samsung reserves the right to modify, amend, or supplement its Invalidity Contentions in accordance with claim construction rulings from this Court, claim construction positions taken by iCashe, or to the extent permitted by this Court. Samsung also reserves the right to modify, amend or supplement its Invalidity Contentions upon iCashe's modification of its asserted claim constructions, including as adopted by iCashe in its Infringement Contentions.

Samsung's Invalidity Contentions are based in part on its present understanding of iCashe's Infringement Contentions. In some instances, the apparent claim construction positions in iCashe's Infringement Contentions contradict the teachings of each of the Asserted Patents, contradicting the understanding of the claim terms by a person of ordinary skill in the art, and are vague and conclusory concerning how the claim limitations supposedly read on the accused products or activities. To the extent iCashe is permitted to supplement its Infringement Contentions, Samsung reserves the right to amend and/or supplement its Invalidity Contentions.

Samsung's Invalidity Contentions do not represent its agreement or view as to the meaning of any claim term contained therein. By including prior art that anticipates or renders obvious claims based on the construction apparently applied by iCashe to its claims, Samsung's Invalidity Contentions are not—and should not be interpreted as—adoptions or admissions as to the accuracy of that scope or construction. Nothing in Samsung's Invalidity Contentions should be deemed to be an admission regarding the scope of any claims or the proper construction of those claims or any terms contained therein. Nor should anything contained herein be understood or deemed to be

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an express or implied admission or contention regarding the proper construction of any terms in any asserted claim, or regarding the alleged infringement of that claim.

Unless otherwise stated herein, Samsung takes no position on any matter of claim construction in these Invalidity Contentions. Samsung reserves the right to propose any claim construction it considers appropriate and to contest any claim construction it considers inappropriate. Samsung also reserves the right to argue that certain additional claim terms, phrases, and elements are indefinite, lack written description, are not patentable, are not novel or are otherwise invalid under 35 U.S.C. § 101 or § 112.

Because of the uncertainty of claim construction, Samsung reserves the right to further supplement or modify the positions and information in these Invalidity Contentions, including without limitation, the prior art and grounds of invalidity set forth herein, after the Asserted Claims have been construed, in accordance with the Local Patent Rules and the Court's Orders.

II. INVALIDITY CONTENTIONS

A. Invalidity Contentions Pursuant to the Scheduling Order

Subject to Samsung's reservation of rights herein, and regarding each asserted claim in iCashe's Infringement Contentions, Samsung provides these Invalidity Contentions in accordance with the Docket Control Order, Discovery Order, and Local Patent Rule 3-3. Attached as Exhibit H is a list identifying each item of prior art that either anticipates or renders obvious each asserted claim and that Samsung has identified to date.

Samsung further reserves the right to use any portion of the patent, publication, related publications, commercial embodiments of the publication, and other evidence discovered in this litigation to demonstrate or evidence the components, functionality, and capabilities of the devices and systems disclosed in the references charted. Where Samsung identifies a particular figure in a prior art reference, the identification should be understood to encompass the caption and

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description of the figure and any text relating to the figure in addition to the figure itself. Similarly, where an identified portion of text refers to a figure or other material, the identification should be understood to include the referenced figure or other material as well.

A person of ordinary skill in the art would generally read a prior art reference as a whole and in the context of other publications, literature, and general knowledge in the field. To understand and interpret any specific statement or disclosure in a prior art reference, a person of ordinary skill in the art would rely upon other information including other publications and general scientific or engineering knowledge. Samsung therefore reserves the right to rely upon other unidentified portions of the prior art references and on other publications and expert testimony to provide context and to aid understanding and interpretation of the identified portions. Identified portions are exemplary only. Samsung also reserves the right to rely upon other portions of the prior art references, other publications, and the testimony of experts to establish that the alleged inventions would have been obvious to a person of ordinary skill in the art, including the basis of modifying or combining certain cited references.

Samsung also identifies and hereby incorporates by reference as if set forth fully herein the prior art references identified as anticipating or rendering obvious Asserted Claims in any Patent Office filing or proceeding challenging the validity of the Asserted Patents in the U.S. or anywhere in the world. Such references may be from any prior or future reissue, reexamination, or *inter partes* review (IPR) of the Asserted Patents. Further, Samsung incorporates by reference all filings, prior art references identified therein, and supporting expert declarations in the Asserted Patents. Samsung also incorporates by reference, as if set forth fully herein, all prior art cited during the prosecution.

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To the extent any limitation of an Asserted Claim is deemed not to be exactly disclosed by an item of prior art, then any purported differences are such that the claimed subject matter as a whole would have been obvious to one skilled in the art at the time of the alleged invention, in view of the state of the art and knowledge of those skilled in the art. Numerous prior art references, including those identified by Samsung herein, reflect common knowledge and the state, scope and content of the prior art before the priority dates of the Asserted Patents. *See Graham v. John Deere Co.,* 383 U.S. 1, 35-36 (1966).

Furthermore, to the extent any limitation of an Asserted Claim is deemed not to be exactly disclosed by an item of prior art, then the claim is rendered obvious by combination of the prior art item with one or more other items of prior art identified in these disclosures. For example, Samsung reserves the right to rely on any claim chart in Exhibits A1 through G5 standing alone, in combination with the reference(s) in any other claim chart, in combination with any of the references listed in Exhibits A, B, C, D, E, F, or G in combination with Applicant's Admitted Prior Art, and/or in view of the knowledge of a person of ordinary skill in the art. In addition, Samsung reserves the right to rely on any reference listed in Exhibits A, B, C, D, E, F, or G alone, in combination with the reference(s) in any claim chart in Exhibits A1 through G5, in combination with any of the other references listed in Exhibits A, B, C, D, E, F, or G in combination with Applicant's Admitted Prior Art, and/or in view of the knowledge of a person of ordinary skill in the art. Though these claim charts provide illustrative citations to where each element may be found in the prior art references or in their combination, the cited references may contain other disclosures of each claim element as well, and Samsung reserves the right to argue any claim elements of the Asserted Claims of the Asserted Patents are disclosed in non-cited portions of these references. For at least the reasons described above and below in the examples provided as well

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as in the claim charts appended hereto, it would have been obvious to one of ordinary skill in the art to combine any of a number of prior art references.

B. Motivation to Combine

The U.S. Supreme Court decision in *KSR Int'l Co. v. Teleflex Inc., et al.* 127 S. Ct. 1727, 1739 (2007) ("*KSR*") held that a claimed invention can be obvious even if there is no explicit, written teaching, suggestion, or motivation for combining the prior art to produce that invention. Accordingly, Samsung believes that no showing of an express motivation to combine prior art is required to combine the references disclosed in Exhibits A1 through F21 or Exhibits A, B, C, D, E, or F as each combination of art would have no unexpected results, and at most would simply represent a known alternative to one of ordinary skill in the art. *See KSR Int'l Co. v. Teleflex, Inc.*, 127 S.Ct. 1727, 1739-40 (2007) (rejecting the Federal Circuit's "rigid" application of the teaching, suggestion, or motivation to combine test, and instead espousing an "expansive and flexible" approach).

The Supreme Court in *KSR* held that a person of ordinary skill in the art is "a person of ordinary creativity, not an automaton" and "in many cases a person of ordinary skill in the art will be able to fit the teachings of multiple patents together like pieces of a puzzle." *Id*. at 1742. "In determining whether the subject matter of a patent claim is obvious, neither the particular motivation nor the avowed purpose of the patentee controls. What matters is the objective reach of the claim." *Id.* at 1741-42. "Under the correct analysis, any need or problem known in the field of endeavor at the time of invention and addressed by the patent can provide a reason for combining the elements in the manner claimed." *Id.* at 1742. In particular, the Supreme Court emphasized the principle that "[t]he combination of familiar elements according to known methods is likely to be obvious when it does no more than yield predictable results." *Id.* at 1739. A key

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inquiry is whether the "improvement is more than the predictable use of prior art elements according to their established functions." *Id.* at 1740.

The rationale to combine or modify prior art references is significantly stronger when the references seek to solve the same problem, come from the same field, and correspond well. In *In re Inland Steel Co.,* 265 F.3d 1354 (Fed. Cir. 2001), the Federal Circuit allowed two references to be combined as invalidating art when "[the prior art] focus[es] on the same problem that the . . . patent addresses. . . . Moreover, both [prior art references] come from the same field. . . . Finally, the solutions to the identified problems found in the two references correspond well." *Id.* at 1362.

Although Samsung contends that no specific showing of motivation to combine is necessary for the references cited in the attached Exhibits, Samsung hereby preliminarily identifies specific motivations and reasons to combine the cited art. One or more combinations of the prior art references identified herein would have been obvious because these references would have been combined using: known methods to yield predictable results; known techniques in the same way; a simple substitution of one known, equivalent element for another to obtain predictable results; or a teaching, suggestion, or motivation in the prior art generally. In addition, it would have been obvious to try combining the prior art references identified herein because there were only a finite number of predictable solutions or because known work in one field of endeavor prompted variations based on predictable design incentives or market forces either in the same field or a different one. In addition, the combination of prior art references identified herein would have been obvious because the combinations represent known potential options with a reasonable expectation of success.

Additional evidence that there would have been a motivation to combine the prior art references identified in the attached exhibits includes the interrelated teachings of multiple prior

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art references; the effects of demands known to the community or present in the marketplace; the existence of a known problem for which there was an obvious solution encompassed by the Asserted Claims; the existence of a known need or problem in the field of the endeavor at the time of the invention(s); and the background knowledge that would have been possessed by a person having ordinary skill in the art. The claimed subject matter required nothing more than combining prior art elements according to known methods to yield predictable results. One of ordinary skill in the art would have been motivated to combine the prior art, in that it required only simple substitutions of one known element for another to obtain predictable results. Thus, a skilled artisan seeking to solve this problem would look to these cited references in combination.

Furthermore, a person of ordinary skill at the time of the alleged invention had reason to combine or modify one or more of the references listed and charted in Exhibits A1-G5, Exhibits A, B, C, D, E, F, and/or G, as illustrated in the Exhibits, in light of the knowledge of a person of ordinary skill in the art at the time of the invention and information in the prior art cited herein. The reasons or motivation to combine the prior art would include, for example, the fact that the prior art for the Asserted Claims is in the same field, and one of ordinary skill in the art implementing a device, system, or method in accordance with the Asserted Claims would have been motivated to investigate the various related existing devices, systems, methods, publications or patents identified in these contentions to address the particular needs. Indeed, the claimed subject matter required nothing more than combining prior art elements according to known methods to yield predictable results. One of ordinary skill in the art would have been motivated to combine the prior art, in that it required only simple substitutions of one known element for another to obtain predictable results. Moreover, these references cross-reference and discuss one another, illustrating the close technical relationship among them.

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To the extent any piece of prior art refers to or discusses other pieces of prior art, either expressly or inherently, it would have been obvious to combine those pieces of prior art for that reason. In addition, design incentives and other market forces would have prompted those combinations and modifications. Furthermore, prior art references may arise from common assignees or multiple companies operating within the relevant subject matter. The motivation to combine references includes the common objectives and subject matter of the identified references. Accordingly, the teachings of the individual prior art references, combined with the industry knowledge of a person of ordinary skill in the art at the time of the alleged invention of the Asserted Patents, would render obvious the Asserted Claims.

1. '965, '722, '053 Patents

A POSITA would have been motivated to combine the teachings of the identified prior art references, e.g., as set forth in Exhibits A, B, and C; and Exhibits A1-A5; Exhibits B1-B5; Exhibits C1-C9. The '965, '722, '053 Patents share a common specification, and state that the "Field" of their purported invention "relates generally to contactless communications devices, and more specifically to contactless smartcard devices." *See, e.g.*, '965 patent, 1:6–8; '722 patent, 1:7–9; '053 patent, 1:41–43. Similar to the '965, '722, '053 Patents, all of the identified prior art references for the '965, '722, '053 Patents relate, directly or indirectly, to contactless communications devices, and are pertinent to one or more problems allegedly addressed by the '965, '722 and '053 patents, such as the desirability of integrating smartcard functionality into personal mobile devices, maintaining an operable range for RFID tags incorporated into mobile devices, deploying mobile devices for near-field communications (NFC), and expanding NFC applications to mass transit, mobile payment, and other transactions. *See, e.g.*, Exhibits A, B, C; Exhibits A1-A5, B1-B5, C1-C9; Bangs, [0002] ("Near field RF (radio frequency) communication

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requires an antenna of one near field RF communicator to . . . to be inductively coupled between the communicators."); Finkenzeller, [0006] ("For simple and fast contactless communication between two devices . . . an inductive transmission technology which is known as so-called near field communication (NFC)."); Yamazaki-279, [0215] ("This embodiment mode will describe applications of a semiconductor device of the present invention which communicates data by wireless communication . . . incorporated in . . . products such as electronic devices.")' Kim-277, [0032] ("[A] reader device 200 communicates with the tag device 100 through wireless short distance communication in order to collect information of the tag device 100."); Keen, [0001] ("This invention relates to wireless communicators, in particular near field wireless communicators and devices."); Vega, 4:51–64 ("The present invention includes a method, apparatus and system for providing electrostatic communication . . . through capacitive coupling which requires no physical contact or wires between a reader and an electrostatic transceiver (a.k.a. electrostatic tag or electrostatic transponder)."); Gerstenberger, [0001] ("The invention relates to . . . card-shaped data carriers with integrated circuits, which are equipped with an antenna for contactless functionalities."); Wilson, 1:6–13 ("Near field RF (radio frequency) communication requires . . . inductive[] coupl[ing] between the communicators.")' Dachs at Abstract ("Near Field Communication (NFC) . . . enables contactless peer-to-peer communication . . and, when combined with a smart card IC, emulation of a contactless card."); Philips Specification at 3 ("The PN531 [controller] is a highly integrated transmission module for contactless communication at 13.56 MHz."). Each of the identified references relates to the same field of endeavor and/or address the same or similar problem, and a POSITA would have been motivated—and would have found it straightforward and obvious—to combine their teachings, with a reasonable expectation

of success, in a manner that meets each of element of the Asserted Claims of the '965, '722, '053 Patents.

(a) Incorporation of Tags into Mobile Devices

Many of the charted references teach incorporation of tags into mobile devices, including mobile phones. *See* Exhibits A, B, and C; Exhibits A1-A5, B1-B5, and C1-C9. In addition, a POSITA would have been motivated—and would have found it straightforward and obvious—to combine the teachings of incorporating tags into mobile devices with the other references.

In near-field RF communications (NFC), it was known that a "reader" device "initiates the transmission of an RF signal" to a "tag" device, and the tag device provides a response to the reader. Keen, [0003] ("'RFID tag' will be used . . . for any near field communicator which is operable to respond to a received RF signal . . .. 'RFID reader' will be used . . . for any near field communicator which initiates the transmission of an RF signal and which is operable to wait for a response."). *See also*, Bangs, [0003] ("[R]eaders . . . are capable of initiating a near field RF communication" and "tags . . . are capable of responding to initiation of a near field RF communication."). Thus, a tag device is a transponder that provides a predefined response to an interrogating reader device. *See* Bangs, [0003] ("[R]esponding near field RF communicators such as RFID transponders or tags . . . are capable of responding to initiation of a near field RF communication."); Gerstenberger, [0042] ("For data transmission, the transponder unit sends a signal to a reader, which the reader can evaluate as a signal from a transponder."). Typically, a tag device "contains detailed information" about a corresponding object that the reader device may use to identity and characterize the object. *See* Kim-277, [0033]. This predefined communication arrangement between an NFC reader and tag device is well-suited for and frequently used for authentication purposes, *e.g.*, authenticating the identity of a tag-holder in a financial transaction. *See, e.g.,* Kim-277, [0033] ("[T]ag device 100 . . . contains detailed information of a corresponding

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object" and thus, may be used "to perform user authentication and electronic payment."); Gerstenberger, [0002] ("Card-shaped data carriers . . . used in mobile phones to authenticate the mobile phone when logging into a mobile network.")

As noted above, incorporating tags into mobile devices, such as mobile phones, was well-known. *See* Exhibits A, B, and C; Exhibits A1-A5, B1-B5, and C1-C9. Some exemplary disclosures are as follows: Bangs, [0003] ("'[N]ear field RE communicator" includes . . . responding . . . RFID tags."), [0006] ("Near field RF communicators may be . . . incorporated within or coupled to larger electrical devices or host devices . . . for example, mobile telephones, portable computing devices."); Finkenzeller, [0006] ("[S]o-called near field communication (NFC) . . . is integrated for example in mobile telephones or PDAs to permit communication between the devices."); Gerstenberger, [0003] ("[C]onventional card-shaped data carriers with an integrated circuit . . . can be equipped with an antenna for contactless data transfer over medium ranges (for example Near Field Communication NFC)."); Yamazaki-279, [0215] ("[A] semiconductor device of the present invention which communicates data by wireless communication . . . can be used as a so-called ID label, ID tag, or ID card . . . incorporated in, for example . . . products such as electronic devices . . . a mobile phone, and the like."); Keen, [0004] ("Such near field communicators . . . may be incorporated into or provided as part of the functionality of larger host devices . . . for example a consumer product such as a portable communications device having telecommunications capability (for example a mobile telephone (cellphone) or a telecommunications-enabled personal digital assistant or other computing device)."); Vega, 3:10–20 ("it is desirable to introduce an RFID apparatus, system, and method that . . . can be easily packaged for a wide range of applications."); Kim-277, [0033] ("The tag device . . . can be attached or function in cooperation with another device to provide various

services."); Wilson, 3:5–23 ("[A]n RF transponder or tag . . . may be incorporated within or coupled to or otherwise associated with larger electrical devices or hosts . . . [*i.e.,*] near field RF communications-enabled devices."); Dachs at Fig. 1 (illustrating an "NFC" and "Smart card IC" integrated into a mobile phone); Philips Specification at 5 ("Typical devices to integrate the PN531" transmission module into include "Mobile phones," "PDAs," etc.).

A POSITA would have been motivated to incorporate a tag into a mobile device because integrating tags into various mobile and portable devices is critical to ensuring that NFC technology can be deployed in a large variety of different applications with diverse use cases. *See, e.g.,* Bangs, [0006] ("When incorporated within a larger device or host," such as "portable audio and/or video players such as MP3 players, IPODs®, CD players, DVD players . . . consumer products such as domestic appliances or personal care products" "near field RF communicator . . . areas of application are payment systems, ticketing systems, for example in tickets (for example parking tickets, bus tickets, train tickets or entrance permits or tickets) or in ticket checking systems, toys, games, posters, packaging, advertising material, product inventory checking systems and so on."); Kim-277, [0033] ("The tag device 100 is attached to persons, automobiles, goods, livestock, and buildings . . . to provide various services."); Dachs at Abstract ("Near Field Communication (NFC) is opening-up completely new perspectives for the mobile communication industry . . .. Different architectures are being considered for NFC and security mobile phone architectures."); Wilson, 3:5–23. For example, a POSITA would have understood that deploying a tag in a mobile phone advantageously enables users to use their phones for authentication purposes rather than a separate tag device. *See, e.g.,* Bangs, [0006] ("When incorporated within a larger device or host . . . Some areas of application are payment systems."). To illustrate, deploying a tag that authenticates user identity to a bank in a mobile phone obviates the need to

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carry a separate bank card, *i.e.* tag device, to transact with the bank. A user could use their phone to make purchases. *See,* Dachs at Abstract ("Near Field Communication (NFC)" enables "reading/writing of contactless cards and, when combined with a smart card IC, emulation of a contactless card.").

A POSITA would have therefore found it beneficial to turn to the charted references for a greater "choice of components" and design considerations for a tag that will improve its integration into host mobile devices and increase the range of possible applications. *See* Vega, 3:10–20 ("It is desirable to increase the choices of components available for use in an RFID transponder . . . to further integrate components of an RFID transponder such that manufacturing costs are lowered. . . . Additionally, it is desirable to introduce an RFID apparatus" that "has high manufacturability, and can be easily packaged for a wide range of applications."). As further discussed below, the charted references also provide teachings of tag componentry that address host mobile device limitations. Thus, a POSITA would have recognized the benefits of combining these references with one another.

A POSITA would have expected success in combining the teachings of each of the charted references with the other references as described above. These combinations of prior art references would have involved no more than the predictable use of prior art elements according to their established functions in a known manner, as reflected by, e.g., the teachings cited in Exhibits A1-A5; Exhibits B1-B5; Exhibits C1-C9. A POSITA would thus have had a reasonable expectation of success in combining the teachings of these references, yielding the Asserted Claims of each of the '965, '722, '053 Patents.

(b) Tag Components

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As discussed in turn below, many of the charted references teach tag components that a POSITA would have been motivated to apply in incorporating tags into mobile devices.

(i) **Smartcard controller**

Many of the charted references teach smartcards and associated controllers. *See* Exhibits A, B, and C; Exhibits A1-A5, B1-B5, and C1-C9. Some exemplary disclosures are as follows: Bangs [0043] ("[A]n NFC communicator may be . . . a smart card."); Finkenzeller [0091] ("[S]mart card chips having a so-called S2C interface . . . connect[] the smart card chip to an HF interface of an NFC device. Such smart card chips have hardware means for generating and decoding signals required on an ISO/IEC 14443 interface."); Gerstenberger [0009] ("[T]he integrated circuit of the data carrier has an S2C interface."); Kim-277 [0033] ("[T]he tag device 100 can be mounted on a smart card."); Dachs at 469 ("NFC and security hardware functionality is realized by combining two devices: the PN531 NFC controller with embedded firmware and the SmartMX a High Security Smart Card IC.")

A POSITA would have been motivated to apply smartcard controllers to a mobile device tag to advantageously incorporate smartcard functionality into a host mobile device equipped with a tag. First, incorporating a smartcard controller into a tag enhances the tag's functionality beyond merely providing a predefined response to an interrogating reader device. For example, because the smartcard controller directs processing and storing data on the embedded circuit, it facilitates storing "detailed information [about the tag's] corresponding object" useful for, *e.g.,* authenticating a tag-holder's identity. Kim-277 [0033] ("[T]he tag device . . . contain[ing] detailed information of a corresponding object" "can be mounted on a smartcard to perform user authentication and electronic payment."). Second, incorporating the tag with smartcard functionality into a mobile device would advantageously yield a mobile device with smartcard functionality, thereby increasing it's the use cases and applicability of the mobile device. *See, e.g.,*

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Dachs at Abstract ("Near Field Communication (NFC) . . . combined with a smart card IC, emulat[es] a contactless card."). Thus, a user could use a mobile phone for transactions that would ordinarily require a physical smartcard, *e.g.*, mobile payments, access control, inventory tracking.

A POSITA would have had an expectation of success integrating smartcard controllers into tags. For example, schemes and interfaces for coupling an off-the-shelf smartcard controller to a tag device were well known. *See, e.g.,* Finkenzeller [0091] ("There are smart card chips having a so-called S2C interface . . . for connecting the smart card chip to an HF interface of an NFC device."), [0085]; Gerstenberger [0009] ("If the integrated circuit of the data carrier has an S^2C interface . . . the SIGIN connections for the signal input and SIGOUT for the signal output can be addressed equally . . .."). Moreover, signal processing functions pertinent to a smartcard controller were well known. *See, e.g.,* Bangs [0054] ("[T]he NFC communicator controller 107 may control modulation and modulation protocols."); Finkenzeller [0091] ("Such smart card chips have hardware means for generating and decoding signals required on an ISO/IEC 14443 interface."). Thus, a POSITA would have recognized the benefits of combining the smartcard and associated controller teachings with tags, and the combination would yield predictable results.

(ii) **Antenna**

Many of the charted references provide teachings of tag antennas. *See* Exhibits A, B, and C; Exhibits A1–A5, B1–B5, and C1–C9.

A POSITA would have been motivated to apply tag antenna design teachings to tags incorporated into mobile devices to advantageously ensure the mobile device tag's compatibility with conventional NFC readers. To facilitate interoperability amongst NFC devices, conventional NFC devices operate according to known contactless communication standards. Bangs [0005] ("[N]ear field RF communicators are defined in various standards for example ISO/IEC 18092,

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ISO/IEC 14443, ISO/IEC 15693 ISO/IEC 21481."); Keen [0003] ("[N]ear field communicators are RFID (Radio Frequency Identification) transceivers ('readers') or transponders ('tags') . . . operate under the RFID ISO/IEC 14443A protocol or ISO/IEC 15693 protocol or NFC (Near Field Communication) communicators operating under the NFCIP-1 (ISO/IEC 18092) or NFCIP-2 (ISO/IEC 21481) protocol."). Thus, a POSITA would have understood that implementing an antenna that conforms to known contactless standards ensures the tag's compatibility with conventional NFC reader devices. *See*, Bangs [0052] (noting that a "compatible" tag "opera[tes] at the same frequency and in accordance with the same protocols . . . set out in various [contactless] standards.").

A POSITA would have further found it straightforward to apply tag antenna design teachings in implementing a mobile device tag. Doing so would have involved no more than the predictable use of prior art elements according to their established functions in a known manner to yield predictable results. For example, it was well-known to implement a loop antenna in a tag to facilitate inductive coupling with a reader device. *See, e.g.,* Bangs [0002] ("Near field RF (radio frequency) communication requires an antenna of one near field RF communicator to be present within the alternating magnetic field (H field) . . . of another near field RF communicator by transmission of an RF signal . . . to enable the magnetic field (H field) of the RF signal to be inductively coupled between the communicators."). The prior art further teaches tuning the tag antenna to a resonant frequency that "NFC communicators commonly operate at or around, 13.56 MHz." Bangs [0052]; Finkenzller [0002] ("Transponders . . . have an electronic circuit and, depending on the frequency domain, an antenna coil (e.g. 13.56 MHz)."); Yamazaki-279 [0070] ("[A] frequency of a signal transmitted and received between the first antenna circuit 101 and the reader/writer 201 is . . . 13.56 MHz . . . which is standardized by ISO or the like.").

(iii) **Passive and active transmit circuits**

The charted prior art references explain that a "passive" tag that derives power from a reader device and transmits a response to the reader by modulating the reader's RF interrogation signal. *See, e.g.,* Bangs [0053] ("When using a passive protocol the NFC communicator (initiator) will transmit and maintain its RF field . . . and the target will modulate that RF field with the data to be communicated."); Finkenzeller [0006] ("In the passive mode . . . a reading device . . . generates a field which the other unit can then influence by means of load modulation."); Gerstenberger [0042] ("[C]onventional transponders . . . [respond to a reader device by] modulat[ing] the reader field into a modulated reader field.").

Conventional NFC readers "are generally designed . . . to enable initiation or generation of an RF H field and to detect modulation or affects on that initiated RF H field." Bangs [0007]. Likewise, passive tags are designed to "receive an RF H field" from the reader, and thus be inductively coupled to the reader, "and to modulate that H field, for example by load modulation." Bangs [0007]. The sidebands of the interrogating H field's carrier frequency are modulated to embed transmit data. *See* Finkenzeller, [0049] ("[T]he modulation side bands carrying the information arise in the spectrum below and above the two subcarriers."). However, limiting a tag's antenna size, for example, due to host device space constraints, "detrimentally affect[s] the range over which inductive coupling my be achieved." Bangs [0010]–[0011] ("The use of [passive] antenna circuit designs . . . thus requires compromise in the operating range or functionality of the NFC communicator."). *See also*, '965 patent, 1:32–2:6 (explaining that a passive tag's "loop antenna is necessarily large" to permit inductive coupling with a reader device and therefore, "attempts to implement passive tags in smaller mobile devices . . . have met with

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limited success due . . . to the size of the loop antenna"); '722 patent, 1:32–2:8; '053 patent, 1:56–2:42.

To get around the range limitations of passive tags, many of the prior art references teach an active tag that generates and modulates its own RF signal to respond to a reader device. *See* Exhibits A, B, and C; Exhibits A1-A5, B1-B5, and C1-C9.

A POSITA would have been motivated to apply active transmission teachings in implementing a mobile device tag to advantageously improve the tag's operable transmission range. *See, e.g.,* Finkenzeller [0004] ("The range within which communication is possible in the system . . . can be increased by using active transponders."); Bangs [0011] (explaining that a tag "operate[s] at a greater range when initiating an RF H field" than "when modulating a received RF H field").

A POSITA would have therefore found it beneficial to turn to the charted prior art for detailed teachings of designing active transmission circuits. For example, modulating the actively generated carrier RF signal such that it "simulate[s] load modulation" of the reader device signal was well-known. Finkenzeller [0010] ("Instead of performing a load modulation or backscatter modulation of a field of the reading device, the trans-ponder unit itself thus emits a field that simulates for the reading device a modulation of the reading device field by a transponder."); Keen [0088] ("The NFC communicator . . . [employs] two mechanisms for enabling communication of data when the NFC communicator is in the target mode. One mechanism is a load modulation mechanism . . . and the other is an interference mechanism which simulates load modulation."); [0090] (describing components providing simulated load modulation scheme). To that end, a POSITA would have been motivated to modulate transmit data into the sidebands about the interrogating signal's carrier frequency, *e.g.,* occupying "the spectrum below and above" the

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carrier frequency, to simulate load modulation of the interrogating signal, which would allow for more efficient use of transmitter power and radio spectrum bandwidth, resulting in improved communication range and signal clarity. Finkenzeller, [0049]–[0050], [0019] ("The inventive transponder unit sends the data only in side bands spaced at the frequency of the (modulated) data signal to the transmitting frequency of the reading device."), [0062]. Doing so ensures the tag's compatibility with conventional reader devices that only communicate by means of modulation of its own RF field. The prior art further teaches active transmission circuit configurations specifically for a tag implementing smartcard functionality. For example, the Philips Specification teaches implementing load modulation circuitry within the smartcard controller. *See, e.g.,* Philips Specification at Figure 3.2 (describing I/O pins on pn51 smartcard controller include pin for "Load Modulation output" from controller).

Many of the charted references also teach a tag implementing *both* passive and active transmission schemes. *See* Exhibits A, B, and C; Exhibits A1-A5, B1-B5, and C1-C9.

A POSITA would have been motivated to apply alternating passive and active transmission scheme teachings in a mobile device tag to advantageously improve the tag's power efficiency. *See, e.g.,* Kim-277 [0005] ("[A] tag device . . . can efficiently use power by . . . operating in a passive mode modulation method or an active mode modulation method depending on the kind of power."); Vega, 13:7–14:10 ("[A]fter the transmit time has occurred, the power to the amplifier 477 may be turned OFF to conserve power."); Yamazaki-279 [0072] ("[P]ower can be supplied to the power supply circuit 106 . . . by two ways: one is . . . similar[] to the passive type RFID described in the conventional example . . . the other is a . . . battery 104 is charged by a battery charging signal."). That way, the tag can conserve its power source when operating "within normal [passive tag] communication range" by deriving power from the reader device rather the tag's

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power source. *See* Finkenzeller [0022] ("The switchover between the load modulator and the circuit configuration is . . . effected in such a way that the load modulator is used within the normal communication range, and the inventive modulator outside the normal communication range.").

A POSITA would have therefore also found it beneficial to turn to the charted prior art for detailed teachings of switching between passive and active transmission schemes. For example, conditions that trigger a switchover from passive to active transmission were known in the prior art. *See, e.g.,* Finkenzeller [0022] ("The switchover between the load modulator and the circuit configuration is preferably effected automatically, in dependence on the level of voltage induced on the antenna."); Kim-277 [0089] ("The tag device 100A can operate in at least one of a passive mode, an active mode . . . depending on whether power is supplied" adequately through inductive coupling with the reader.); Yamazaki-279 [0072] ("[T]he battery 104 can be supplied to the [tag's] power supply circuit 106 . . . where enough power cannot be obtained from the first antenna circuit 101 of the [reader device] when a communication distance extends."). The prior art also provides detailed teachings on electronic couplings that effectuate such alternating transmission mechanisms. *See, e.g,* Vega, 13:7–14:10 (providing a detailed description of couplings for "switch[ing] . . . power [ON/]OFF to circuitry connected to the device power line").

(iv) **Input amplifier**

Many of the charted references teach an input amplifier for amplifying received signals. *See* Exhibits A, B, and C; Exhibits A1–A5, B1–B5, and C1–C9.

Similar to a POSITA's motivation, discussed above, to improve a mobile device tag's transmission range, a POSITA would have been motivated to apply the input amplifier teachings in a mobile device tag to advantageously improve the tag's reception range. *See, e.g.,* Vega, 3:28–45 ("Additionally the transceiver circuit includes amplifiers and filters so that the [tag']s read

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range is further increased."), 6:1–22 (explaining that an active tag's "read range" is greater than a passive tag's read range where the active tag "use[es] an amplifier").

A POSITA would have therefore found it beneficial to turn to the charted references for their detailed teachings of input amplifier specifications and coupling locations on the integrated circuit. For example, the charted references teach coupling the input amplifier between an "antenna circuit" and "controller" such that a received signal is amplified *before* being provided to a controller. Bangs [0049] ("[T]he receiver circuitry comprises an amplifier 119 coupled to the antenna circuit 102 and . . . the controller 107 for amplifying and demodulating a modulated RF signal . . . from another near field RF communicator in near field range and for supplying the thus-extracted data to the controller 107 for processing."); Finkenzeller [0106] ("The inventive active transponder . . . receive branch consists of an antenna 3, an input amplifier 91), Fig. 9 (showing an amplifier 91 coupled between antenna 3 and transponder chip CL); Yamazaki-279 [0005] ("In an active type RFID . . . a communication signal received by an antenna circuit 3101 is inputted to a demodulation circuit 3105 and an amplifier 3106" which amplifies the signal "and supplies it to a logic circuit 3107."), Fig. 31 (showing amplifier 3106 coupled between antenna circuit 3101 and logic circuit 3107).

The prior art further teaches technical implementation details for the input amplifier, such as the gain factor and time constant to implement. *See, e.g.,*Finkenzeller [0109] ("[A] gain control 92 the gain factor of the input amplifier 91 is now so adjusted that the output amplitude of the voltage amplified by the input amplifier 91 remains largely constant. The time constant of the control is preferably so adjusted here that the output voltage of the amplifier 91 remains constant in case of varying distance from the reading device.").

(v) **Driver circuits**

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Many of the charted references teach driver circuits for driving circuit components. *See, e.g.,* Bangs [0050] ("[Tag] transmitter circuitry comprises a signal generator 109 coupled via a driver 111 to the antenna circuit 102.").

A POSITA would have recognized that driver circuits enable IC components to interface with each other. A POSITA would have therefore been motivated—and found it straightforward and obvious—to apply driver circuit teachings to mobile device tags to advantageously effectuate interoperability of the aforementioned integrated smartcard controller and tag components, and to effectuate an increased range of transmission. Doing so would have involved no more than the predictable use of prior art elements according to their established functions in a known manner to yield predictable results. For example, the prior art references provide detailed teachings of driving certain tag components, such as the transmit antenna and controller. *See, e.g.,* Bangs [0050] ("[Tag] transmi[ssion] circuitry comprises a signal generator . . . coupled via a driver 111 to the antenna circuit.").

(vi) **Local power source**

Many of the references teach using a host device's power source to power the tag's electronic circuit components. *See* Exhibits A, B, and C; Exhibits A1-A5, B1-B5, and C1-C9.

A POSITA would have been motivated to apply local power source teachings to advantageously sustain power to the aforementioned circuit components that maintain the tag's communication range. It was well-known that the componentry effectuating improvements to a tag's communication range, *i.e.,* the input amplifier and active transmission circuits, may not derive sufficient power from inductive coupling to operate and thus, should be powered by a separate power source. *See, e.g.,* Finkenzeller [0004] ("The energy supply of the active transponder, for example in form of a battery, operates its electronic circuit."); Vega, 6:1–22

("[A]n energy storage means within the active electrostatic transceiver 104 allows for . . . using an amplifier."). A POSITA would have further understood that a tag incorporated into a mobile device derives its power from the host mobile device. *See,* Vega, 13:7–14:10 ("[T]he energy storage means 360 is coupled to the device power line.").

A POSITA would have therefore found it beneficial to turn to the charted references for their teachings of coupling the host device power source to the tag components. *See, e.g.,* Vega, 13:7–14:10 (providing a detailed discussion of component power lines coupling tag components to the host device power source); Finkenzeller [0004] ("The energy supply of the active transponder . . . operates its electronic circuit."); Dachs at Figure 2 (showing tag device is locally "powered for digital processing").

* * *

A POSITA would have had an expectation of success in combining the teachings of the various components into mobile device tags as described above. These combinations of prior art references would have involved no more than the predictable use of prior art elements according to their established functions in a known manner, as reflected by, e.g., the teachings cited in Exhibits A1-A5; Exhibits B1-B5; Exhibits C1-C9. A POSITA would thus have had a reasonable expectation of success in combining the teachings of these references, yielding the Asserted Claims of each of the '965, '722, '053 Patents.

(c) NFC

Many of the charted references teach deploying tags in various NFC applications. *See* Exhibits A1-A5; Exhibits B1-B5; Exhibits C1-C9. Some exemplary disclosure are as follows: Bangs [0006] ("Some areas of [NFC] application are payment systems, ticketing systems, for example in tickets (for example parking tickets, bus tickets, train tickets or entrance permits or

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tickets) or in ticket checking systems, toys, games, posters, packaging, advertising material, product inventory checking systems."); Finkenzeller [0054] ("[A] mobile terminal comprising an inventive transponder unit could be used as a maintenance or monitoring unit for checking for operability . . . [of] a multiplicity of RFID reading devices, for example at the cash registers of a supermarket or an access system.").

A POSITA would have been motivated to apply NFC application teachings in mobile device tags to advantageously tailor the mobile devices for a specific NFC application. For example, considerations for deploying tags in different applications, such as a ticketing systems and mobile transactions, were well-known in the prior art. *See, e.g.,* Gerstenberger [0002] ("[Implementing at tag in a] SIM card[] . . . usually in the ID-000 format according to GSM11.11 and TS102.221" for "use[] in mobile phones to authenticate the mobile phone when logging into a mobile network."); Vega, 2:66–3:9 (explaining the need to optimise a tag's communication range in "a ticket admittance system" because "a ticket holder passes through an entrace of the ticket admittance system" at "quite a distance away" from the reader).

A POSITA would have had an expectation of success in combining NFC application teachings in mobile device tags as described above. These combinations of prior art references would have involved no more than the predictable use of prior art elements according to their established functions in a known manner, as reflected by, *e.g.,* the teachings cited in Exhibits A1-A5; Exhibits B1-B5; Exhibits C1-C5. A POSITA would thus have had a reasonable expectation of success in combining the teachings of these references, yielding the Asserted Claims of each of the '965, '722, '053 Patents.

2. '219, '156, '423, and '174 Patents

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A POSITA would have been motivated to combine the teachings of the identified prior art references, e.g., as set forth in Exhibits D, E, F, G, and Exhibits D1-D7; Exhibits E1-E9; Exhibits F1-F5; Exhibits G1-G5. The '219, '156, '423, and '174 Patents share a common specification, and state that the "Field" of their purported invention "relates generally to electronic devices, and more specifically to electronic devices that may perform transactions." *See, e.g.*, '219 patent, 1:7-9; '156 patent, 1:6-8; '423 patent, 1:7-9; '174 patent, 1:48-50. Similar to the '219, '156, '423, and '174 Patents, all of the identified prior art references for the '219, '156, '423, and '174 Patents relate, directly or indirectly, to electronic devices used to perform transactions, and are pertinent to one or more problems allegedly addressed by the '219, '156, '423, and '174 patents, such as the desirability of using a single device to perform different transactions, improving transaction security, facilitating mobile payments, and allowing for easy, reliable, and efficient transactions, etc. *See, e.g.*, Exhibits D, E, F, G, D1-D7; Exhibits E1-E9; Exhibits F1-F5; Exhibits G1-G5. Accordingly, each of the identified references relates to the same field of endeavor and/or address the same or similar problem, and a POSITA would have been motivated—and would have found it straightforward and obvious—to combine their teachings, with a reasonable expectation of success, in a manner that meets each of element of the Asserted Claims of the '219, '156, '423, and '174 Patents.

(a) Performing Electronic Transactions

Many of the charted references teach the use of electronic circuitry to perform transactions such as financial transactions by communicating with existing terminals. *See* Exhibits D, E, F, G, and Exhibits D1-D7; Exhibits E1-E9; Exhibits F1-F5; Exhibits G1-G5.

A POSITA would have been motivated—and would have found it straightforward and obvious—to combine the teachings of using electronic circuitry to perform transactions such as financial transactions with the other references. Many of the charted references provide teachings

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of methods, systems, or devices (including mobile phones and/or mobile devices) in which electronic circuitry (including memory, drivers, current carrying conductors, antennas, processors, etc.) is used to perform electronic transactions (such as financial transactions, access transactions, etc.), by communicating (including through the transmission of time varying magnetic fields that may mimic swiping a magnetic card) with existing terminals or card readers (including point-of sale terminal, hybrid card readers, etc.). *See* Exhibits D, E, F, G, and Exhibits D1-D7; Exhibits E1-E9; Exhibits F1-F5; Exhibits G1-G5. Some exemplary disclosures are as follows: Abe-171 at [0001] ("The present invention relates to . . . an information processing system, information communication terminal and method, information processing apparatus and method, recording medium, and program capable of enabling safer electronic commercial transactions in a straightforward manner."); Burkhardt-283 at Abstract ("A device and method for transferring data from a microprocessor located in a transaction card through a card reader by emulating a prerecorded magnetic stripe on a conventional transaction car such as a credit or debit card."); Cortina-273 at [0133] ("an RF cellular telephone can be used as a substitute for credit cards, transforming the cellular telephone into the media of commercial transactions"); Doughty-787 at [0002] ("The present invention relates generally to the field of electronic devices and equipment used in the authentication and processing of commercial and security related transactions and, more particularly, to a system, method and apparatus for enabling transactions using biometrically enabled programmable magnetic stripes."); Dua-060 at [0002] ("The present invention relates generally to systems and methodologies for conducting electronic commerce and more particularly to systems and methodologies for issuing, managing, storing and using credentials authorizing the legitimate holder of such a credential to accomplish a desired result."); Fox-624 at 1:4-8 ("This invention relates to smartcard electronic devices and, more particularly, to the incorporation of

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smartcard devices in a cellular telephone for enhanced verification, security and accessibility to data stored on the smartcard."); Haginawa-847 at [0001] ("The present invention relates to an IC card, and more particularly to an application for performing a billing process using an IC card."); Kean-986 at [0002] ("this application relates to methods and systems for electromagnetic initiation of secure transactions."); Ong-610 at [0001] ("The present invention relates to an electronic credit card providing secure controlled and reliable transaction of funds."); Yamagata-839 at [0051] ("The mobile terminal is held towards the external apparatus such as the reader/writer, and hence the application can be used using the external apparatus (such as conducting an electronic transaction"); Yoshinaga-2004 at 24 ("i-mode FeliCa allows storing information requiring high-level security measures such as electronic money in mobile terminals . . . stored information can be used in both virtual i-mode stores on the Internet and actual stores."); Yu-038 at [0001] ("The present invention relates to a method for payment and recharging using a mobile terminal equipped with a UIM (user identification module) card.").

As noted above, many of the charted references teach advantageously performing transactions, including financial transactions, by implementing forms of electronic communications to overcome problems related to conventional transactions and communication methods. *See* Exhibits D, E, F, and G; Exhibits D1-D7, E1-E9, F1 to F5, and G1-G5. Some exemplary disclosures are as follows: Fox-624 at 1:46-49 ("it would be desirable to incorporate the electronics associated with a smartcard into an alternate housing arrangement so as to overcome problems and disadvantages associated with flexible plastic smartcards"); Haginawa-847 at [0002] ("In recent years, research and development of a kind of IC card called UIM (User Identity Module), which stores various information and can be built into a mobile phone, an information

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home appliance, a PDA (Personal Digital Assistant), or the like, has been developed. It is underway and is expected to spread in the future.)"

A POSITA would have been motivated to combine the charted references to use electronic circuitry such as electronic smartcard technology because such technology advantageously improves authentication, identification, verification, and/or security of transactions. *See* Exhibits D, E, F, and G; Exhibits D1-D7, E1-E9, F1 to F5, and G1-G5. Some exemplary disclosures are as follows: Fox-624 at 1:5-8 ("This invention relates to smartcard electronic devices and, more particularly, to the incorporation of smartcard devices in a cellular telephone for enhanced verification, security, and accessibility to data stored on the smartcard"); Kean-986 at [0005] ("a general need in the art for methods and systems that provide for electromagnetic initiation of transactions that maintain the security of the information"); Doughty-787 at [0007] ("There is, therefore, a need for a practical and secure card that has the advantages of a smart card and will interface with magnetic stripe readers without the use of adapters. Moreover, there is a need for a proper authentication in multiple account/application cards and devices to reduce the risk to the device holder in the event of loss or fraudulent capture of the data within the multiple accounts on the device."); Ong '610 at [0021]. ("Preferably the storage means is arranged to store electronic cash and the communication means is arranged to facilitate the use of the electronic cash stored in the storage means if the user identification is verified.").

A POSITA would also have been motivated to combine the charted references to advantageously allow for simpler and/or more flexible transactions, for example, by allowing a single smartcard to be associated with multiple applications or accounts. *See* Exhibits D, E, F, and G; Exhibits D1-D7, E1-E9, F1 to F5, and G1-G5. Some exemplary disclosures are as follows: Yamagata-839 at [0010] ("A single IC card thus serves a plurality of purposes. For example, a

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single IC card stores two or more applications, such as electronic money for conducting electronic transactions and an electronic ticket for entering a specific concert hall. This single IC card serves various purposes."); Yu '038 at [0010] ("According to the present invention characterized in said manner, because various card information is stored in a single user identification module card, inserted into a mobile terminal, there is no need to carry a number of cards for payment").

A POSITA would also have been motivated to combine the charted references to provide additional detailed teachings of elements that may have been described in more general terms or that left the details of certain implementations to a POSITA. *See* Exhibits D, E, F, and G; Exhibits D1-D7, E1-E9, F1 to F5, and G1-G5. For example, a POSITA would have understood that applying the teachings of the other charted references related to circuitry to produce magnetic fields (such as memory, drivers, current carrying conductors, antennas, processors, etc.) to facilitate transactions including to communicate with card readers or other point-of-sale terminals. Some exemplary disclosures are as follows: Fox-624 at Abstract ("A cellular telephone (10) incorporates the electronics for implementing both a cellular telephone function (46) and a smartcard function (45). This allows the electronics to be protected from damage by the housing associated with the cellular telephone and also decreases the likelihood that the smartcard will be lost or stolen."); Doughty-787 at Abstract ("The present invention provides a system, method and apparatus that includes a user device having a magnetic field generator disposed within a substrate that is normally inactive, a biometric sensor mounted on the substrate, a memory disposed within the substrate and a processor disposed within the substrate that is communicably coupled to the magnetic field generator, the biometric sensor and the memory. The processor is operable to process biometric information received from the biometric sensor to verify that a user is authorized to use the apparatus and activate the magnetic field generator when the user is verified. A power

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source is also disposed within the substrate. The magnetic field generator can create a spatially varying magnetic signal using a magnetic stripe and one or more induction coils, or create a time-varying magnetic signal for emulating data obtained from swiping a magnetic stripe card through a magnetic card reader."). As another example, a POSITA would also have understood combining the charted references to perform secure transactions, through e.g. the use of transaction numbers such as single-transaction account numbers because such combinations would have advantageously allowed for and improved authentication, identification, verification, and/or security of the disclosed beneficial transactions. Some exemplary disclosures are as follows: Haginawa-847 at [0017] ("the communication management means is configured to use the communication identification means based on a use identification number received from a near-field communication wireless function of a peripheral device"). As another example, a POSITA would also have understood that combining the charted references would allow for utilizing network interfaces and/or teachings that would have advantageously allowed for *e.g.* carrying out communications via network, updating smartcard information via a network, and/or authenticating users via a network. Some exemplary disclosures are as follows: Abe-171 at [0093] ("[t]he mobile telephone 11 is operated by the user so as to carry out wireless communication with the nearest base station 12, access the point-of-purchase server 21 via the network 10"); Ong-610 at [0025] ("Preferably the communication means includes a telephone network interface"); Fox-624 at 5:35–46 ("since cellular telephone 10 includes both smartcard and cellular telephone functions, information stored within the smartcard of telephone 10 has the ability to be updated or modified by utilizing the incorporated cellular telephone function.") A POSITA would have recognized the benefits of combining these references with one another.

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A POSITA would have had an expectation of success in combining the charted references as described above. These combinations of prior art references would have involved no more than the predictable use of prior art elements according to their established functions in a known manner, as reflected by, e.g., the teachings cited in Exhibits D, E, F, G, and Exhibits D1-D7; Exhibits E1-E9; Exhibits F1-F5; Exhibits G1-G5. A POSITA would thus have had a reasonable expectation of success in combining the teachings of these references, yielding the Asserted Claims of each of the '219, '156, '423, and '174 Patents.

(b) Transaction Features

Many of the charted references teach hardware, software, or features of transactions that render obvious the Asserted Claims of each of the '219, '156, '423, and '174 Patents. *See* Exhibits D, E, F, and G; Exhibits D1-D7, E1-E9, F1 to F5, and G1-G5.

A POSITA would have been motivated to combine the charted references to take advantage of interrelated teachings about performing transactions, such as by improving security (*e.g.* via transaction numbers, authentication codes, or other methods of verifying the user and/or smartcard information), by improving networking to allow for network communications (*e.g.* network communications related to end-users, smartcards, financial accounts, transactions, purchases, applications etc.), by utilizing magnetic fields to facilitate transactions, and/or by utilizing hardware and/or software to assist in transactions (*e.g.* software to install or upgrade applications, smartcard interfaces, circuitry for producing magnetic fields, etc.). *See* Exhibits D, E, F, and G; Exhibits D1-D7, E1-E9, F1 to F5, and G1-G5. Some exemplary disclosures are as follows: Bursch-444 at 7:50-54 ("transaction number generators may be implemented in handheld devices"); Codron-043 2:10-13 ("By immediately transmitting a message to the legitimate card holder's mobile phone and/or email account the legitimate card holder is immediately (often in a period of less than 30 seconds and usually less than 300 seconds) warned that use is being made

of his card."); Flitcroft-833 at 18:25-30 ("Cards/single use numbers can be issued directly into an electronic device that is capable of storing such numbers. This applies to mobile phones and pager devices"); Hanada-365 at [0006] ("The present invention has been made in view of such circumstances, and has as its object to sequentially generate and distribute computer programs in which authentication information for easily performing highly reliable user authentication is embedded); Horowitz-542 at [0002] ("The present invention relates to financial transaction cards, and more particularly, to a system and method for transferring value on a transaction card from an advanced technology memory on the card to a magnetic stripe memory on the card. "); Jo-744 at Abstract ("the transfer of fund to an appointed account is operated by a phone banking or an internet banking, and the user confirms the refilled amount"); Johansson-837 at Abstract ("An apparatus for upgrading a mobile telephone"); Keen '200 at [0013] ("In one aspect, the present invention provides a near field communicator comprising a driver operable to drive an antenna or coil to produce a magnetic field; a magnetic field sensor operable to sense the magnetic field produced by the antenna or coil; a comparator operable to compare, directly or indirectly, the sensed magnetic field strength with a desired parameter, and a controller operable to control the driver to compensate for a difference between the sensed magnetic field strength and the desired parameter."); Mamba '073 at [0001] (" The present invention relates to a non-contact IC system and a mobile terminal for transmitting and receiving data using electromagnetic waves as a medium. In particular, it relates to a non-contact IC system in which a non-contact IC module is mounted in a terminal such as a mobile telephone."); Oishi-373 at [0001] ("The present invention relates to a technology for changing or expanding the function of a telephone in which a computer device is incorporated"); SCAR PT-04002 at 4 ("Merchants can implement a contactless payment solution quickly and easily and start accepting the contactless payment cards and fobs that are now

being issued. American Express, MasterCard, and Visa have standardized on a single contactless payment standard in the United States, ISO/IEC 14443, and are implementing or recommending a contactless payment approach that leverages the existing payments infrastructure. What this means is that merchants can easily add a contactless RF payment terminal to their existing POS systems and start accepting contactless payment"); Sovio-882 at [0002] ("More particularly, the invention relates to electronic payment schemes in a mobile environment for secure short-range transactions."); Takekawa-275 at [0002] ("The present invention is related to both an information processing device such as a IC card capable of retaining data in a secure manner, and also an information processing terminal such as a portable telephone, a PDA (Personal Digital Assistant), and a personal computer, which mount thereon the above-explained information processing device.").

A POSITA would have been motivated to combine the charted references to provide additional detailed teachings of elements that may have been described in more general terms or that left the details of certain implementations to a POSITA. *See* Exhibits D, E, F, and G; Exhibits D1-D7, E1-E9, F1-F5, and G1-G5. For example, a POSITA would have understood that combining the charted references would have provided the advantage of secure mobile transactions, for example through the use of single transaction account numbers to carry out authentication of a user or to securely transfer financial or other information necessary to perform a transaction. Some exemplary disclosures are as follows: Sovio-882 at [0010] ("To further enhance transaction security, the smart card stores a plurality of one-time authentication codes to initiate secure connections between the smart card and the device); Flitcroft-833 at Abstract ("A credit card system is provided which has the added feature of providing additional limited-use credit card numbers and/or cards"); 18:25-26 ("Cards/single use numbers can be issued directly

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into an electronic device that is capable of storing such numbers"); Bursch-444 at 7:50-51 ("transaction number generators may be implemented in handheld devices."). A POSITA would have also understood that security would be enhanced through, e.g., periodically downloading transaction information to ensure that, even if the secure transaction information somehow became available to others, it would be replaced periodically with new information and therefore would provide better security.

As another example, a POSITA would have also understood that combining the charted references would have provided network benefits, including during the course of transactions, for example to carry out authentication, wireless communication, financial information, etc. Some exemplary disclosures are as follows: Dua-060 at Abstract ("Credentials are ultimately supplied to a handheld device such as a mobile telephone via a wireless network. The user holding the credential may then use the handheld device to conduct the authorized transaction or set of transactions via, for example, a short range wireless link with a point-of-sale terminal."); Jo-744("The payment and balance refill system for a contactless transportation card, characterized in that is made through a wireless communication network in a state that can always be connected").

As another example, a POSITA would have understood that combining the charted references would have provided advantages related to hardware and software and software applications, for example to facilitate transactions. Some exemplary disclosures are as follows: Haginiwa-847 at [0025] ("[t]he IC card 7 is actually a JavaCard (registered trademark) UIM in a plug-in shape and capable of mounting a plurality of applications,"); Yamagata '839 at [0117] ("The memory 52 is used to allocate a storage region to one or more applications."); Keen-200 at [0013] ("In one aspect, the present invention provides a near field communicator comprising a driver operable to drive an antenna or coil to produce a magnetic field; a magnetic field sensor

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operable to sense the magnetic field produced by the antenna or coil; a comparator operable to compare, directly or indirectly, the sensed magnetic field strength with a desired parameter, and a controller operable to control the driver to compensate for a difference between the sensed magnetic field strength and the desired parameter."). For example, Fox discloses that the processor of the smartcard device and the phone processor can be integrated into a single processor but leaves it to a POSITA to provide details for what that would look like. *See* Fox-624 at 4:43–56 ("Alternately, the functions of main control 44 and MPU 41 of smartcard logic function 42 may be combined into one single MPU."). A POSITA would have understood that this processor would be part of the phone because the phone processing is always necessary for the phone. A POSITA would have further understood that the MPU would be updated by downloading software with relevant functionality from the smartcard device onto memory that could then be read by the MPU to perform processing, which is taught by, *e.g.*, Johanssen or Takekawa. *See* Takekawa-275 at [0108] ("When a user 45 inserts the IC card 10 into the information processing terminal 30, the terminal-sided electronic money application program 311 is initiated which has been automatically loaded on the information processing terminal"); Johansson-837 at 2:17–20 ("It is accordingly an object of the present invention to provide a method and apparatus for upgrading mobile telephones in a better and more efficient way to overcome the disadvantages discussed above."). A POSITA would have been motivated to apply teachings of downloading software from a smart card/sim card to the phone's memory to allow the phone to adaptably perform functionality of the card inserted into the phone.

As another example, a POSITA would have understood that combining the charted references would have provided advantages related to generating and using time varying magnetic fields to facilitate transactions. Some exemplary disclosures are as follows: SCAR PT-04002 at 4

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("Merchants can implement a contactless payment solution quickly and easily and start accepting the contactless payment cards and fobs that are now being issued. American Express, MasterCard, and Visa have standardized on a single contactless payment standard in the United States, ISO/IEC 14443, and are implementing or recommending a contactless payment approach that leverages the existing payments infrastructure. What this means is that merchants can easily add a contactless RF payment terminal to their existing POS systems and start accepting contactless payment."); Mamba-073 at [0001] "The present invention relates to a non-contact IC system and a mobile terminal for transmitting and receiving data using electromagnetic waves as a medium. In particular, it relates to a non-contact IC system in which a non-contact IC module is mounted in a terminal such as a mobile telephone.").

A POSITA would have had an expectation of success in combining the charted references as described above. These combinations of prior art references would have involved no more than the predictable use of prior art elements according to their established functions in a known manner. *See, e.g.*, Exhibits D, E, F, G, and D1-D7; Exhibits E1-E9; Exhibits F1-F5; Exhibits G1-G5. A POSITA would thus have had a reasonable expectation of success in combining the teachings of these references, yielding the Asserted Claims of each of the '219, '156, '423, and '174 Patents.

* * *

Accordingly, the motivation to combine the teachings of the prior art references disclosed herein is found in the references themselves and: (1) the nature of the problem being solved; (2) the express, implied and inherent teachings of the prior art; (3) the knowledge of persons of ordinary skill in the art; (4) the fact that the prior art is generally directed towards relevant methods

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and systems; or (5) the predictable results obtained in combining the different teachings of the prior art.

Samsung reserves the right to rely on one or more references identified in Exhibits A1 through G5 and/or Exhibits A, B, C, D, E, F, or G as further evidence of obviousness under 35 U.S.C. § 103, as background references demonstrating the state of the art, or for any other purpose. Based on further investigation and discovery, based on positions that iCashe may take regarding the scope of the Asserted Claims, and/or based on the Court's claim construction, Samsung reserves the right to amend and/or supplement these contentions and to rely on these references to prove the invalidity of the Asserted Claims in a manner consistent with this Court's Rules and with the Federal Rules of Civil Procedure.

C. Additional Prior Art Offered For Sale and/or Publicly Used or Known or That May Lead to Discovery of Additional Prior Art

Samsung contends that the Asserted Claims are invalid as anticipated and/or obvious in view of public knowledge and uses and/or offers for sale of products and services under 35 U.S.C. §§ 102(a) and/or (b). For example, Samsung's Preliminary Invalidity Contentions and accompanying document production reference or describe products and/or systems that were on sale or otherwise publicly available before the alleged priority date of the Asserted Patents. Samsung has not had the opportunity to take discovery on any of the systems and does not have sufficient information to provide invalidity charts for all of the systems. Based on the information presently available, Samsung identifies the following exemplary prior art systems that may anticipate and/or render obvious the Asserted Claims of the Asserted Patents or lead to the discovery of additional prior art that anticipates or renders obvious the Asserted Claims of the Asserted Patents, but which Samsung has not been able to provide charts for at this time.

1. '965, '722, '053 Patents

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Based on presently available information, the following systems were offered for sale, sold, or publicly used, or information thereof known by the following entities at least as of the following dates.

Prior Art System	Entity	Date
BenQ T80	BenQ	Nov. 2007
Nokia 5140i with Field Force NFC Shell	Nokia	2005
Nokia 6131 NFC	Nokia	Jan. 2007
Nokia NFC Shell for Nokia 3220 Phone	Nokia	2004
Nokia 6212 Classic	Nokia	2009
Motorola SLVR L7	Motorola	2007
PN532 NFC Controller	NXP Semiconductors	2007

2. ’219, ’156, ’423, and ’174 Patents

Based on presently available information, the following systems were offered for sale, sold, or publicly used, or information thereof known by the following entities at least as of the following dates.

Prior Art System	Entity	Date
ExxonMobil Speedpass	ExxonMobil	1997
MasterCard PayPass	MasterCard	2002
American Express ExpressPay	American Express	2002
Bank of America QuickWave	Bank of America	2002
Nokia NFC Shell for Nokia 3220 Phone	Nokia	2004

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SK Telecom MONETA Payment Service	SK Telecom	2003
NTT DoCoMo i-mode FeliCa (aka Osaifu Keitai)	NTT DoCoMo	2003

In addition to adding new products as the basis for prior art as additional discovery is obtained, Samsung also may rely on other documents or things that have not yet been located to support its contentions regarding such device(s) or product(s) that are referenced in the charts.

In addition, to the extent that the Asserted Patents are not entitled to a priority date that is before the earliest sale date of an Accused Product, then that product is prior art that invalidates the Asserted Claims if and to the same extent that the Accused Product is found to infringe.

As discovery is ongoing, Samsung continues to investigate these items and reserves the right to amend or supplement these contentions to include additional information or documents regarding such products and/or systems.

III. INVALIDITY UNDER 35 U.S.C. § 112

Pursuant to the Scheduling Order, Samsung contends that the Asserted Claims of the Asserted Patents are invalid under 35 U.S.C. § 112 because (1) the claims are indefinite, (2) the claims lack adequate written description; and/or (3) the claims are not enabled. Samsung's contentions that the following claims are invalid under 35 U.S.C. § 112 are made in the alternative and do not constitute, and should not be interpreted as, admissions regarding the construction or scope of the claims of the Asserted Patents, or that any of the claims of the Asserted Patents are not anticipated or rendered obvious by prior art. iCashe has not yet provided a claim construction for any of the terms or phrases that Samsung anticipates will be in dispute. Samsung, therefore, cannot provide a complete list of § 112 defenses because Samsung does not know whether iCashe will proffer a construction for certain terms and phrases that is broader than, or inconsistent with,

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the construction that would be supportable by the disclosure set forth in the specifications of the Asserted Patents. Samsung offers these contentions without prejudice to any position it may ultimately take as to any claim construction issues and in any potential proceedings before the United States Patent and Trademark Office (USPTO).

The following contentions, made pursuant to the Scheduling Order, are subject to revision and amendment pursuant to Federal Rule of Civil Procedure 26(e) and the Orders of record in this matter to the extent appropriate, *e.g.*, in light of further investigation and discovery regarding the defenses, the Court's construction of the claims at issue, and/or review and analysis of expert witnesses. Samsung offers these contentions in response to iCashe's apparent interpretation of the Asserted Claims and iCashe's Infringement Contentions, which remain insufficient under the Patent Rules, including for failure to provide a "chart identifying specifically where each element of each asserted claim is found within each Accused Instrumentality," as required by Local Parent Rule 3-1(c).

For each listed term or phrase, Samsung believes that the claim containing the term or phrase is invalid under § 112, as is any claim depending therefrom or including such terms or phrases. In listing each term or phrase, Samsung also reserves the right to argue that any sub-term or sub-phrase contained there is also invalid under § 112.

A. The '965 Patent

The Asserted Claims of the '965 Patent fail to satisfy the requirements of 35 U.S.C. § 112 because at least the following phrases are indefinite:

- "performance enhancement circuits" (claims 1, 5, 7, 11)
- "smartcard controller is coupled to be powered by the mobile device" (claims 4, 10)
- "amplifier is coupled to amplify a signal received from the antenna and to [provide an amplified signal to]/[drive] the smartcard controller" (claims 1, 7, 13)

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- "performance enhancement circuits are coupled to be powered by the mobile device" (claims 5, 11)
- "the active transmit driver circuit is coupled to be powered by the mobile device" (claim 16)
- "the amplifier coupled to be powered by the mobile device" (claim 17)
- "an amplifier coupled to amplify signals received at the antenna and drive the smartcard controller" (claim 13)
- "inductive element too small to draw enough power sufficient to operate the smartcard controller from an interrogating radio frequency (RF) field" (claims 3, 9, 19)
- "active transmit driver circuit" (claims 7, 15–16)

The Asserted Claims of the '965 Patent fail to satisfy the requirements of 35 U.S.C. § 112 because at least the following phrases lack written description support[1]:

- "performance enhancement circuits" (claims 1, 5, 7, 11)
- "amplifier" (claims 1, 7, 13, 17)
- "amplifier . . . coupled to amplify [a signal/signals]" (claims 1, 7, 13, 17)
- "load modulation circuit" (claims 1, 14)
- "inductive element too small to draw enough power sufficient to operate the smartcard controller from an interrogating radio frequency (RF) field" (claims 3, 9, 19)
- "performance enhancement circuits are coupled to be powered by the mobile device" (claims 5, 11)
- "the active transmit driver circuit is coupled to be powered by the mobile device" (claim 16)
- "the amplifier coupled to be powered by the mobile device" (claim 17)
- "active transmit driver circuit" (claims 7, 15–16)

[1] The '965 Patent claims priority to U.S. App. No. 12 /188,346 (346-Application) filed Aug. 8, 2008. *See also iCashe, Inc. v. Samsung Electronics Co., Ltd. et al*, Case No. 2:24-00429 (E.D. Tex filed Jun. 6, 2024), Dkt. 1 (Complaint) at ¶ 19 ("The '965 claims priority to U.S. Patent Application No. 12/188,346, filed on August, 2008."). However, the claim terms identified here are not disclosed in the 346-Application specification and thus, lack written description support in the original specification under § 112.

The Asserted Claims of the '965 Patent fail to satisfy the requirements of 35 U.S.C. § 112 because at least the following phrases lack enablement[2]:

- "performance enhancement circuits" (claims 1, 5, 7, 11)
- "amplifier" (claims 1, 7, 13, 17)
- "amplifier . . . coupled to amplify [a signal/signals]" (claims 1, 7, 13, 17);
- "load modulation circuit" (claims 1, 14)
- "inductive element too small to draw enough power sufficient to operate the smartcard controller from an interrogating radio frequency (RF) field" (claims 3, 9, 19)
- "performance enhancement circuits are coupled to be powered by the mobile device" (claims 5, 11)
- "the active transmit driver circuit is coupled to be powered by the mobile device" (claim 16)
- "the amplifier coupled to be powered by the mobile device" (claim 17)
- "active transmit driver circuit" (claims 7, 15–16)

B. The '722 Patent

The Asserted Claims of the '722 Patent fail to satisfy the requirements of 35 U.S.C. § 112 because at least the following phrases are indefinite:

- "amplifier coupled to be powered by the mobile device" (claims 1, 5, 11)
- "smartcard controller is coupled to be powered by the mobile device" (claims 3, 7, 13);
- "amplifier is coupled to amplify a signal received from the antenna and to provide an amplified signal to the smartcard controller" (claims 1, 5, 11)
- "active circuit" (claim 1)
- "active transmit driver [circuit]" (claims 9, 11)
- "the active transmit driver circuit is coupled to be powered by the mobile device" (claim 11)

[2] The '965 Patent claims priority to U.S. App. No. 12 /188,346 (346-Application) filed Aug. 8, 2008. *See also iCashe, Inc. v. Samsung Electronics Co., Ltd. et al*, Case No. 2:24-00429 (E.D. Tex filed Jun. 6, 2024), Dkt. 1 (Complaint) at ¶ 19. However, the claim terms identified here are not disclosed in the 346-Application specification and are thus, not enabled by the specification's disclosures.

- "inductive element too small to draw enough power sufficient to operate the smartcard controller from an interrogating radio frequency (RF) field" (claims 2, 6, 12)
- "the antenna that in operation forms a signal that mimics the at least on frequency sideband" (claims 1, 5)

The Asserted Claims of the '722 Patent fail to satisfy the requirements of 35 U.S.C. § 112 because at least the following phrases lack written description support[3]:

- "load modulation circuit[ry]" (claims 1, 5, 8, 11)
- "load modulation circuitry for half duplex communication by creating at least one frequency sideband about a carrier frequency of an itnerrogating radio frequency (RF) field" (claims 1, 5, 11)
- "the antenna that in operation forms a signal that mimics the at least one frequency sideband" (claims 1, 5)
- "amplifier" and "amplifier is coupled to amplify a signal" (claims 1, 5, 11)
- "amplifier coupled to be powered by the mobile device" (claims 1, 5, 11)
- "active circuit" and "active transmit driver [circuit]" (claims 1, 9, 11)
- "the active transmit driver circuit is coupled to be powered by the mobile device" (claim 11)

The Asserted Claims of the '722 Patent fail to satisfy the requirements of 35 U.S.C. § 112 because at least the following phrases lack enablement[4]:

- "load modulation circuit[ry]" (claims 1, 5, 8, 11)

[3] The '722 Patent claims priority to U.S. App. No. 12 /188,346 (346-Application) filed Aug. 8, 2008. *See also iCashe, Inc. v. Samsung Electronics Co., Ltd. et al*, Case No. 2:24-00429 (E.D. Tex filed Jun. 6, 2024), Dkt. 1 (Complaint) at ¶ 20 ("The '965 claims priority to U.S. Patent Application No. 12/188,346, filed on August, 2008."). However, the claim terms identified here are not disclosed in the 346-Application specification and thus, lack written description support in the original specification under § 112.

[4] The '722 Patent claims priority to U.S. App. No. 12 /188,346 (346-Application) filed Aug. 8, 2008. *See also iCashe, Inc. v. Samsung Electronics Co., Ltd. et al*, Case No. 2:24-00429 (E.D. Tex filed Jun. 6, 2024), Dkt. 1 (Complaint) at ¶ 20. However, certain claim terms identified here are not disclosed in the 346-Application specification and are thus, not enabled by the specification's disclosures.

- "load modulation circuitry for half duplex communication by creating at least one frequency sideband about a carrier frequency of an interrogating radio frequency (RF) field" (claims 1, 5, 11)
- "the antenna that in operation forms a signal that mimics the at least one frequency sideband" (claims 1, 5)
- "amplifier" (claims 1, 5, 11)
- "amplifier coupled to be powered by the mobile device" (claims 1, 5, 11);
- "active circuit" (claim 1)
- "active transmit driver [circuit]" (claims 9, 11)
- "the active transmit driver circuit is coupled to be powered by the mobile device" (claim 11)
- "inductive element too small to draw enough power sufficient to operate the smartcard controller from an interrogating radio frequency (RF) field" (claims 2, 6, 12).

C. The '053 Patent

The Asserted Claims of the '053 Patent fail to satisfy the requirements of 35 U.S.C. § 112 because at least the following phrases are indefinite:

- "active transmit driver circuit" (claims 1, 6, 17)
- "ticketing information for a mass transit system" (claims 2, 19)
- "transaction information for a mobile payment" (claims 1, 20)

The Asserted Claims of the '053 Patent fail to satisfy the requirements of 35 U.S.C. § 112 because at least the following phrases lack written description support[5]:

- "active transmit driver circuit" (claims 1, 6, 17)
- "active transmit driver circuit coupled to . . . receive [the] power" (claims 1, 10)
- "amplifier" (claims 6, 7, 8)

[5] The '053 Patent claims priority to U.S. App. No. 12 /188,346 (346-Application) filed Aug. 8, 2008. *See also iCashe, Inc. v. Samsung Electronics Co., Ltd. et al*, Case No. 2:24-00429 (E.D. Tex filed Jun. 6, 2024), Dkt. 1 (Complaint) at ¶ 21 ("The '053 claims priority to U.S. Patent Application No. 12/188,346, filed on August, 2008."). However, the claim terms identified here are not disclosed in the 346-Application specification and thus, lack written description support in the original specification under § 112.

- "amplif[ies/ying] a signal" (claims 1, 8, 18)
- "filter" (claim 6)
- "oscillator" (claim 6)
- "wherein the active transmit driver circuit affects transmission of data between the antenna and the NFC reader" (claim 1)

The Asserted Claims of the '053 Patent fail to satisfy the requirements of 35 U.S.C. § 112 because at least the following phrases lack enablement[6]:

- "active transmit driver circuit" (claims 1, 6, 17)
- "active transmit driver circuit coupled to . . . receive [the] power" (claims 1, 10)
- "amplifier" (claims 6, 7, 8)
- "amplif[ies/ying] a signal" (claims 1, 8, 18)
- "filter" (claim 6)
- "oscillator" (claim 6)
- "ticketing information for a mass transit system" (claims 2, 19)
- "transaction information for a mobile payment" (claims 1, 20)
- "NFC reader is a point-of-sale NFC reader" (claim 4)
- "wherein the active transmit driver circuit affects transmission of data between the antenna and the NFC reader" (claim 1)

D. The '219 Patent

The Asserted Claims of the '219 Patent fail to satisfy the requirements of 35 U.S.C. § 112 because at least the following phrases are indefinite:

- "apparatus with a compatible interface in a mobile phone" (claim 1)
- "apparatus including smartcard circuitry accessible by the mobile device" (claim 1)
- "smartcard circuitry" (claim 1)

[6] The '053 Patent claims priority to U.S. App. No. 12 /188,346 (346-Application) filed Aug. 8, 2008. *See also iCashe, Inc. v. Samsung Electronics Co., Ltd. et al*, Case No. 2:24-00429 (E.D. Tex filed Jun. 6, 2024), Dkt. 1 (Complaint) at ¶ 21. However, certain claim terms identified here are not disclosed in the 346-Application specification and are thus, not enabled by the specification's disclosures.

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- "point-of-sale interface" (claim 1)
- "hybrid smartcard reader" (claim 4)
- "circuitry compatible with a hybrid smartcard reader" (claim 4)

The Asserted Claims of the '219 Patent fail to satisfy the requirements of 35 U.S.C. § 112 because at least the following phrase lacks written description support:

- "apparatus including smartcard circuitry accessible by the mobile phone" (claim 1)
- "point-of-sale interface to communicate with a point of sale terminal" (claim 1)
- "point-of-sale interface receives power from the mobile phone" (claim 1)
- "circuitry to produce at least one time-varying magnetic field" (claim 2)
- "memory accessible by the mobile phone (claims 3, 5)
- "circuitry compatible with a hybrid smartcard reader" (claim 4)

The Asserted Claims of the '219 Patent fail to satisfy the requirements of 35 U.S.C. § 112 because at least the following phrase lacks enablement:

- "apparatus including smartcard circuitry accessible by the mobile phone" (claim 1)
- "point-of-sale interface to communicate with a point of sale terminal" (claim 1)
- "point-of-sale interface receives power from the mobile phone" (claim 1)
- "circuitry to produce at least one time-varying magnetic field" (claim 2)
- "memory accessible by the mobile phone (claims 3, 5)
- "circuitry compatible with a hybrid smartcard reader" (claim 4)

E. The '156 Patent

The Asserted Claims of the '156 Patent fail to satisfy the requirements of 35 U.S.C. § 112 because at least the following phrases are indefinite:

- "circuitry to produce a time-varying magnetic field that mimics a swipe of a magnetic card" (claims 1, 9)
- "circuitry to produce a time-varying magnetic field that represents the transaction data" (claim 1)
- "a processor…to cause the circuitry to produce a time-varying magnetic field that represents the transaction data" (claims 1, 9)

- "transaction data" (claims 1, 3)
- "a time-varying magnetic field that mimics the swipe of a magnetic credit card" (claims 2, 12)
- "financial data" (claims 3,4)
- "credit card data" (claim 4)
- "smartcard circuitry" (claims 5, 9, 10)

The Asserted Claims of the '156 Patent fail to satisfy the requirements of 35 U.S.C. § 112 because at least the following phrase lacks written description support:

- "A mobile device comprising: circuitry to produce a time-varying magnetic field that mimics a swipe of a magnetic card; a memory to hold transaction data; a processor coupled to the circuitry . . . wherein the mobile device comprises a mobile phone." (claim 1)
- "circuitry to produce a time-varying magnetic field that mimics a swipe of a magnetic card" (claims 1, 9)
- "circuitry to produce a time-varying magnetic field that represents the transaction data" (claim 1)
- "a processor…to cause the circuitry to produce a time-varying magnetic field that represents the transaction data" (claims 1, 9)
- "wherein the mobile device comprises a mobile phone" (claims 1, 9)
- "a time-varying magnetic field that mimics the swipe of a magnetic credit card" (claims 2, 12)
- "financial data" (claims 3, 4)
- "credit card data" (claim 4)
- "time-varying magnetic field is used to perform point-of-sale transactions" (claims 8)
- "A mobile device comprising: circuitry to produce a time-varying magnetic field that mimics a swipe of a magnetic card; smartcard circuitry for performing transactions; and a processor coupled to the circuitry . . . wherein the mobile device comprise a mobile phone." (claim 9)

The Asserted Claims of the '156 Patent fail to satisfy the requirements of 35 U.S.C. § 112 because at least the following phrase lacks enablement:

- "A mobile device comprising: circuitry to produce a time-varying magnetic field that mimics a swipe of a magnetic card; a memory to hold transaction data; a

processor coupled to the circuitry . . . wherein the mobile device comprises a mobile phone." (claim 1)

- "circuitry to produce a time-varying magnetic field that mimics a swipe of a magnetic card" (claims 1, 9)
- "circuitry to produce a time-varying magnetic field that represents the transaction data" (claim 1)
- "a processor…to cause the circuitry to produce a time-varying magnetic field that represents the transaction data" (claims 1, 9)
- "wherein the mobile device comprises a mobile phone" (claims 1, 9)
- "a time-varying magnetic field that mimics the swipe of a magnetic credit card" (claims 2, 12)
- "financial data" (claims 3, 4)
- "credit card data" (claim 4)
- "time-varying magnetic field is used to perform point-of-sale transactions" (claims 8)
- "A mobile device comprising: circuitry to produce a time-varying magnetic field that mimics a swipe of a magnetic card; smartcard circuitry for performing transactions; and a processor coupled to the circuitry . . . wherein the mobile device comprise a mobile phone." (claim 9)

F. The '423 Patent

The Asserted Claims of the '423 Patent fail to satisfy the requirements of 35 U.S.C. § 112 because at least the following phrases are indefinite:

- "circuitry to produce a time-varying magnetic field that mimics a swipe of a magnetic card" (claims 1, 9, 15)
- "circuitry to enable use of single transaction account numbers" (claim 15)
- "circuitry to produce a time-varying magnetic field [to be produced] that represents a single transaction account number" (claims 1, 15)
- "a processor…to cause the circuitry to produce a time-varying magnetic field that represents a single transaction account number" (claim 1)
- "circuitry to produce a time-varying magnetic field" (claim 9)
- "the time varying magnetic field mimics a swipe of a magnetic credit card" (claims 2, 12)
- "financial data" (claims 3, 4)
- "credit card data (claim 4)
- "smartcard circuitry" (claims 5, 9, 16)

- "smartcard circuitry for performing transactions using single transaction account numbers" (claim 9)
- "financial transactions" (claim 11)
- "single transaction account numbers have a pre-defined sequence" (claims 13, 17)
- "single transaction account numbers comprise pre-assigned single-use transaction numbers" (claims 14, 18)

The Asserted Claims of the '423 Patent fail to satisfy the requirements of 35 U.S.C. § 112 because at least the following phrase lacks written description support:

- "A mobile phone comprising: circuitry to produce a time-varying magnetic field that mimics a swipe of a magnetic card; and a processor couple to the circuitry . . ." (claim 1)
- "circuitry to produce a time-varying magnetic field that mimics a swipe of a magnetic card" (claims 1, 9, 15)
- "a processor coupled to the circuitry to cause the circuitry to produce a time-varying magnetic field that represents a single transaction account number." (claim 1)
- "circuitry to produce a time-varying magnetic field that represents a single transaction account number" (claims 1, 9, 15)
- "the time varying magnetic field mimics a swipe of a magnetic credit card" (claims 2, 12)
- "time-varying magnetic field is used to perform point-of-sale transactions" (claim 8)
- A mobile phone comprising: circuitry to produce a time-varying magnetic field that mimics a swipe of a magnetic card; smartcard circuitry for performing transactions . . . and a processor coupled to the smartcard circuitry and the circuitry. . ." (claim 9)
- "smartcard circuitry for performing transactions using single transaction account numbers" (claim 9)
- "smartcard circuitry is configured to perform point-of-sale transactions" (claim 10)
- A mobile phone comprising: circuitry to produce a time-varying magnetic field that mimics a swipe of a magnetic card; circuitry to enable the use of single transaction account numbers . . . and a processor coupled to the circuitry. . ." (claim 15)
- "the processor configured to cause a time-varying magnetic field to be produced that represents a single transaction account number" (claim 15)

The Asserted Claims of the ’423 Patent fail to satisfy the requirements of 35 U.S.C. § 112 because at least the following phrase lacks enablement:

- “A mobile phone comprising: circuitry to produce a time-varying magnetic field that mimics a swipe of a magnetic card; and a processor couple to the circuitry . . .” (claim 1)
- “circuitry to produce a time-varying magnetic field that mimics a swipe of a magnetic card” (claims 1, 9, 15)
- “a processor coupled to the circuitry to cause the circuitry to produce a time-varying magnetic field that represents a single transaction account number.” (claim 1)
- “circuitry to produce a time-varying magnetic field that represents a single transaction account number” (claims 1, 9, 15)
- “the time varying magnetic field mimics a swipe of a magnetic credit card” (claims 2, 12)
- “time-varying magnetic field is used to perform point-of-sale transactions” (claim 8)
- A mobile phone comprising: circuitry to produce a time-varying magnetic field that mimics a swipe of a magnetic card; smartcard circuitry for performing transactions . . . and a processor coupled to the smartcard circuitry and the circuitry. . .” (claim 9)
- “smartcard circuitry for performing transactions using single transaction account numbers” (claim 9)
- “smartcard circuitry is configured to perform point-of-sale transactions” (claim 10)
- A mobile phone comprising: circuitry to produce a time-varying magnetic field that mimics a swipe of a magnetic card; circuitry to enable the use of single transaction account numbers . . . and a processor coupled to the circuitry. . .” (claim 15)
- “the processor configured to cause a time-varying magnetic field to be produced that represents a single transaction account number” (claim 15)

G. The ’174 Patent

The Asserted Claims of the ’174 Patent fail to satisfy the requirements of 35 U.S.C. § 112 because at least the following phrases are indefinite:

- “a time-varying magnetic field that represents the transaction data in the plurality of transactions” (claim 1)
- “network interface” (claim 1)

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- "transaction data" (claim 1, 8, 9)
- "downloadable to the mobile phone via a network" (claim 1)
- "time-varying magnetic field represents a point-of-sale transaction" (claim 2)
- "time-varying magnetic field represents an access transaction" (claim 3)
- "access transaction" (claim 3)
- "time-varying magnetic field represents a credit card transaction" (claim 4)
- "time-varying magnetic field emulates a swipe of a magnetic card" (claim 5)
- "downloaded transaction data is valid for a limited number of transactions" (claim 8)
- "downloaded periodically" (claim 8)
- "transaction data includes a transaction number used for each transaction of the plurality of transactions" (claim 9)

The Asserted Claims of the '174 Patent fail to satisfy the requirements of 35 U.S.C. § 112 because at least the following phrase lacks written description support:

- "A mobile phone comprising: a memory to holding transaction data . . . a current carrying conductor capable of producing a time-varying magnetic field . . . a network interface for connecting the mobile phone to a network . . . a drive to excite the current carrying conductor; and a processor coupled to control the driver." (claim 1)
- "a current carrying conductor capable of producing a time-varying magnetic field that represents the transaction data in the plurality of transactions" (claim 1)
- "a network interface for connecting the mobile phone to a network, wherein one or more parts of the transaction data are downloadable to the mobile phone via the network" (claim 1)
- "the time-varying magnetic field represents a point-of-sale transaction" (claim 2)
- "the time-varying magnetic field represents an access transaction" (claim 3)
- "the time-varying magnetic field represents a credit card transaction" (claim 4)
- "time-varying magnetic field emulates a swipe of a magnetic card" (claim 5)
- "downloaded transaction data is valid for a limited number of transactions and the one or more parts of the transaction data is downloaded periodically" (claim 8)
- "transaction data includes a transaction number used for each transaction of the plurality of transactions" (claim 9)

The Asserted Claims of the '174 Patent fail to satisfy the requirements of 35 U.S.C. § 112 because at least the following phrase lacks enablement:

- "A mobile phone comprising: a memory to holding transaction data . . . a current carrying conductor capable of producing a time-varying magnetic field . . . a network interface for connecting the mobile phone to a network . . . a drive to excite the current carrying conductor; and a processor coupled to control the driver." (claim 1)
- "a current carrying conductor capable of producing a time-varying magnetic field that represents the transaction data in the plurality of transactions" (claim 1)
- "a network interface for connecting the mobile phone to a network, wherein one or more parts of the transaction data are downloadable to the mobile phone via the network" (claim 1)
- "the time-varying magnetic field represents a point-of-sale transaction" (claim 2)
- "the time-varying magnetic field represents an access transaction" (claim 3)
- "the time-varying magnetic field represents a credit card transaction" (claim 4)
- "time-varying magnetic field emulates a swipe of a magnetic card" (claim 5)
- "downloaded transaction data is valid for a limited number of transactions and the one or more parts of the transaction data is downloaded periodically" (claim 8)
- "transaction data includes a transaction number used for each transaction of the plurality of transactions" (claim 9)

IV. DOCUMENT PRODUCTION ACCOMPANYING INVALIDITY CONTENTIONS

As required by P.R. 3-4(a), Samsung is concurrently producing documents labeled SAM-429_00036560 through SAM-429_00097474, and is concurrently making source code available for inspection, as documentation sufficient to show the operation of any aspects or elements of an Accused Instrumentality identified by iCashe in its P.R. 3-1(c) charts, to the extent such documents are within Samsung's possession, custody, or control.

Pursuant to P.R. 3-4(b), Samsung is producing each item of prior art identified pursuant to P.R. 3-3(a) which does not appear in the file history of the Asserted Patents—those items of prior art are Bates numbered as SAM-429-PA-00000001 through SAM-429-PA-00001325.

Subject to all reservation of rights and objections set forth herein, and/or after iCashe's identification of all accused devices with specificity, Samsung further reserves the right to

supplement its document production pursuant to the Scheduling Order and Federal Rules of Civil Procedure.

DATED: November 20, 2024 By: */s/ Alexander Middleton*

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CERTIFICATE OF SERVICE

I hereby certify that a true and correct copy of the foregoing document has been served via email to all counsel or record on this 20th day of November, 2024.

/s/ Alexander Middleton

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