UNITED STATES PATENT AND TRADEMARK OFFICE

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BEFORE THE PATENT TRIAL AND APPEAL BOARD

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SAMSUNG ELECTRONICS CO., LTD., and

SAMSUNG ELECTRONICS AMERICA, INC.,

Petitioners,

v.

ICASHE, INC.,

Patent Owner.

_____

Case IPR2025-00642

Patent No. 8,403,219

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DECLARATION OF HENRY N. DREIFUS IN SUPPORT OF PETITION FOR *INTER PARTES* REVIEW OF U.S. PATENT NO. 8,403,219

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I. INTRODUCTION

1. My name is Henry N. Dreifus and I am currently the Managing Director of Dreifus Associates Ltd., Inc. I have been retained on behalf of Samsung Electronics Co. Ltd. and Samsung Electronics America Inc. ("Samsung"), to provide my opinions on certain issues related to U.S. Patent No. 8,403,219 ("the '219 patent") in connection with the above-captioned *inter partes* review ("IPR") proceeding. In particular, I have been asked to provide my insights, analysis, and opinions regarding whether claims 1-6 of the '219 patent ("Challenged Claims") are anticipated by and obvious over the prior art references identified below.

2. I understand that the '219 patent is titled "Apparatus with Smartcard Circuitry Powered by a Mobile Device," names as inventors Siva G. Narendra, Thomas N. Spitzer, and Prabhakar Tadepalli, and, according to USPTO records, is currently assigned to iCashe, Inc. I have considered the '219 patent. I understand that the '219 patent has been provided as Ex. 1001.

3. I understand that the file history of the '219 patent has been provided as Ex. 1002. I have considered this file history, and I will refer to it as "the '219 File History."

4. I understand that the '219 patent is a continuation of U.S. Patent Application No. 13/304,663 ("the '663 Application"), which is a continuation of U.S. Patent Application No. 13/114,434, which is a continuation of U.S. Patent

Application No. 12/941,410, which is a continuation of U.S. Patent Application No. 12/539,369, which is a continuation of U.S. Patent Application No. 11/063,291 ("the '291 Application").

5. I understand that the '219 patent claims a priority date of February 22, 2005, the filing date of the '219 Patent Application. I have been asked to assume the Challenged Claims are entitled to this priority date. I have not been asked to opine on whether the Challenged Claims of the '219 patent are entitled to this priority date, and do not provide any opinion on that subject.

6. My analysis and conclusions set forth in this declaration are based on my educational background and experiences in the field (see Section II). I am qualified to opine concerning what a person of ordinary skill in the art would have known and understood during that time. Before February 22, 2005, my level of skill in the art was at least that of a person of ordinary skill. I am qualified to opine concerning what a person of ordinary skill in the art would have known and understood at the time of the '219 patent's purported invention. My analysis and conclusions herein are from the perspective of a person of ordinary skill in the art as of February 22, 2005.

7. As part of my independent analysis for this declaration, I have considered the following: the background knowledge/technologies that were commonly known to persons of ordinary skill in this art during the time before the

earliest claimed priority date for the '219 patent; my own knowledge and experiences gained from my work experience in the field of the '219 patent and related disciplines; and my experience in working with others involved in this field and related disciplines.

8. I have considered the following non-exhaustive list of references in preparing my declaration. I have been instructed to assume that each of these references qualifies as prior art.

- **U.S. Patent No. 5,943,624 ("Fox")** to Thomas M. Fox et al. ("Fox"), titled "Contactless Smartcard for Use in Cellular Telephone," filed on July 15, 1996 and published on August 24, 1999. I understand that a copy of this reference has been designated as Exhibit 1009. Throughout my declaration, references to Fox are to Exhibit 1009.
- **U.S. Patent Application Publication No. 2005/0015275 ("Takekawa")** to Hiroshi Takekawa et al. ("Takekawa"), titled "Information Processing Device And Information Processing Terminal," filed on July 14, 2004 and published on January 20, 2005. I understand that a copy of this reference has been designated as Exhibit 1020. Throughout my declaration, references to Fox are to Exhibit 1020.

9. I understand that there is a pending district court litigation between Petitioners and iCashe, Inc. ("Samsung Litigation") involving the '219 patent.

10. I am being compensated by Samsung at my standard hourly consulting rate of $500 for my time on this matter. My compensation is not dependent on the outcome of this proceeding or any other proceeding between the parties.

11. In forming my opinions, I have relied on the documents cited in this declaration and the documents identified in the attached Appendix B. These

documents comprise patents, file histories, printed publications, and other related documents. As discussed below, each document is a type that experts in my field would have reasonably relied upon when forming their opinions. Further, experts in my field would have had access to each document either through the applicable patent offices and/or well-known libraries, conferences, or publications in the field. My opinions are also based upon my personal and professional experience.

II. QUALIFICATIONS

12. I am qualified by education and experience to testify as an expert in the field of electronic devices used for transactions including mobile payments including magnetic stripe emulation and RF (Radio-Frequency) for mobile payment applications. The following overview of my background pertains to my qualifications for providing expert testimony in this matter.

13. I am the Founder and Managing Director of Dreifus Associates, Limited (DAL), an Identity technology and Personnel Assurance solutions development and integration organization established in 1991.

14. I have more than 35 years of experience in advanced card solutions including extensive project work on strategic engagements developing systems applying multiple types of card technologies ranging from magnetic, optical and intelligent (smart card) for financial, security, consumer marketing, and information applications.

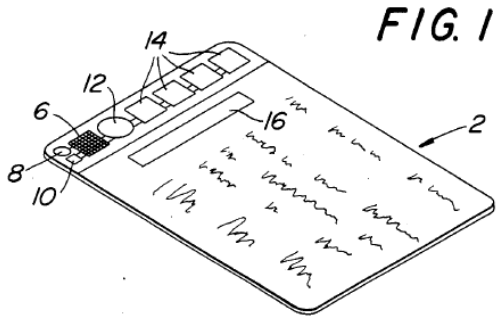
15. I received a Bachelor of Science in Computer Science and Engineering from the Moore School of Engineering at the University of Pennsylvania in 1982 where I was a member of the Engineering Student Council and Chairman of the Association of Computing Machinery (ACM) Chapter. I also obtained a Master of Business Administration degree from Washington University of St. Louis in 1988, where I was a member of the Beta Gamma Sigma Honor Society.

16. I have served as a recognized worldwide advisor in the card technology industry with a vision for the application of enabling technologies to solve business problems.

17. I was also a founding director of the Smart Card Industry Association and served as a delegate to the International Standards Organization (ISO) and the American National Standards Institute (ANSI) developing worldwide standards for smart (integrated circuit) cards.

18. My project assignments in smart card-based solutions include providing consulting and advisory work to various participants of the financial transaction and identification solutions supply chain ranging from the card manufacturers, system component manufacturers to system operators. This has included work for American Express, MasterCard International, Rand McNally Corporation, Visa, Arthur Blank & Company, United States Department of Defense, AT&T, and others.

19. I am the sole inventor of U.S. Patent No. 4,575,621 (the '621 patent), which issued on March 11, 1986. This patent is directed to a contactless portable electronic transaction card 2, for which I designed and wrote the initial device operating system, an example of which is provided in the figure below:



20. During my decades of industry experience, I have been involved in the development of many large-scale card programs including financial transaction and payment platforms, identification (ID) card projects, and I am well-versed in the types of cards, card personalization, and security features that are included in such cards. I have served as a senior project advisor and consultant in the development of need assessments and specifications for large-scale national card programs. Examples of large-scale card programs include:

- Supporting the framework and design for card platform products to incorporate (smart card) integrated circuit card-based solutions including the American Express Blue Card and American Express's participation in

the development of the ICAO contactless "ePassport" machine readable travel documents (MRTD) initiatives;

- The United States Department of Defense Common Access Card for Active Military and Civilian Employees and Geneva Conventions ID Card (which now serves as a basis for all Federal ID Cards (both contact and contactless) issued to Federal Employees across the US Government), including supporting the US Department of Defense representation to the GlobalPlatform;
- The National ID Card program for the Country of Jamaica;
- The National ID Card program for the Organization of Eastern Caribbean States (OECS) member countries; and
- The National ID Card program for the Sultanate of Oman.

21. My responsibilities in connection with these large-scale card programs included developing card specifications, drafting the technical portions of the request for proposals, proposal evaluations, technical acceptance (conformance) review, acceptance testing, and implementation as well as supporting roll outs of finished cards and systems.

22. This work included the planning, design and development of solutions for producing and issuing various types of cards and portable secure data carrier technologies incorporating integrated circuits, such as secure element chips.

23. One such project in the mid-1990's supported Rand McNally Corporation's DocuSystems Division for the feasibility, evaluation, and development of an integrated circuit (smart) card high speed manufacturing platform. This work included the design and development aspects of an integrated circuit card manufacturing line that would include the assembling and subsequent programming/personalization of cards.

24. I also co-authored the book Smart Cards: A Guide to Building and Managing Smart Card Applications, published by John Wiley & Sons.

25. A detailed record of my professional qualifications, including a list of publications, awards, and professional activities, is set forth in my curriculum vitae attached to this report as Appendix A.

26. Based on my experience and education, I believe that I am qualified to opine as to the knowledge and level of skill of one of ordinary skill in the art at the time of the alleged invention of the '219 patent (which I further describe below) and what such a person would have understood of the state of the art during that time. Based on my above-described experience in the field of electronic devices used for transactions including, e.g., mobile payment using magnetic stripe emulation and RF, and the acceptance of my publications in my field, I believe that I am qualified to be an expert with respect to the above-described area of the '219 patent.

III. LEGAL UNDERSTANDING

A. My Understanding of Claim Construction

27. I am not an attorney and offer no legal opinions, but in the course of my work, I have had experience studying and analyzing patents and patent claims from the perspective of a person skilled in the art.

28. I have been informed that patent claims are construed from the viewpoint of a person of ordinary skill in the art of the patent at the time of the alleged invention. I have been informed that patent claims generally should be interpreted consistent with their plain and ordinary meaning as understood by a person of ordinary skill in the art in the relevant time period (*i.e.*, at the time of the purported invention, or the so called "effective filing date" of the patent application), after reviewing the patent claim language, the specification, and the prosecution history (*i.e.*, the intrinsic record).

29. I have further been informed that a person of ordinary skill in the art must read the claim terms in the context of the claim itself, as well as in the context of the entire patent specification. I understand that in the specification and prosecution history, the patentee may specifically define a claim term in a way that differs from the plain and ordinary meaning. I understand that the prosecution history of the patent is a record of the proceedings before the U.S. Patent and Trademark Office and may contain explicit representations or definitions made

during prosecution that affect the scope of the patent claims. I understand that an applicant may, during the course of prosecuting the patent application, limit the scope of the claims to overcome prior art or to overcome an examiner's rejection, by clearly and unambiguously arguing to overcome or distinguish a prior art reference, or clearly and unambiguously disavowing claim coverage.

30. In interpreting the meaning of the claim language, I understand that a person of ordinary skill in the art may also consider "extrinsic" evidence, including expert testimony, inventor testimony, dictionaries, technical treatises, other patents, and scholarly publications. I understand this evidence is considered to ensure that a claim is construed in a way that is consistent with the understanding of those of ordinary skill in the art at the time of the claimed invention. For example, this can be useful for a technical term whose meaning may differ from its ordinary English meaning. I understand that extrinsic evidence may not be relied on if it contradicts or varies the meaning of claim language provided by the intrinsic evidence, particularly if the applicant has explicitly defined a term in the intrinsic record.

B. My Understanding of Anticipation

31. I understand that a patent claim is invalid as "anticipated" if all the limitations of the claim are present, either expressly or inherently, in a single prior art publication or patent.

32. I also understand that a prior art reference can disclose a claimed feature

because the feature is expressly described or because the feature is inherent in the disclosure. I understand that something is inherent in a prior art reference if the missing descriptive matter must necessarily be present, not merely probably or possibly present, and it would be so recognized by a person of ordinary skill in the art as of the priority date of the patent. I understand that it is acceptable to examine evidence outside of the prior art reference (i.e., extrinsic evidence) in determining whether a feature, while not expressly discussed in the reference, is necessarily present in it.

33. I have further been informed that where a reference discloses multiple embodiments, the reference should not be limited to a preferred embodiment. Instead, each disclosed embodiment may anticipate.

34. Moreover, I have been informed that as part of an anticipation analysis, it is proper to take into account not only specific teachings of the reference, but also the inferences that one skilled in the art would reasonably be expected to draw therefrom. A reference can anticipate a claim even if it does not expressly spell out all the limitations arranged or combined as in the claim, if a person of skill in the art, reading the reference, would at once envisage the claimed arrangement or combination.

C. My Understanding of Obviousness

35. I understand that a claim may be invalid if the subject matter described

by the claim as a whole would have been obvious to a hypothetical person of ordinary skill in the art in view of a prior art reference or in view of a combination of references at the time the claimed invention was made. Therefore, I understand that obviousness is determined from the perspective of a hypothetical person of ordinary skill in the art and that the asserted claims of the patent should be read from the point of view of such a person at the time the claimed invention was made. I further understand that a hypothetical person of ordinary skill in the art is assumed to know and to have all relevant prior art in the field of endeavor covered by the patent in suit.

36. I have been informed that there are two criteria for determining whether prior art is analogous and thus can be considered prior art: (1) whether the art is from the same field of endeavor, regardless of the problem addressed, and (2) if the reference is not within the field of the patentee's endeavor, whether the reference still is reasonably pertinent to the particular problem with which the patentee is involved. I have also been informed that the field of endeavor of a patent is not limited to the specific point of novelty, the narrowest possible conception of the field, or the particular focus within a given field. I have also been informed that a reference is reasonably pertinent if, even though it may be in a different field from that of the patentee's endeavor, it is one which, because of the matter with which it deals, logically would have commended itself to a patentee's attention in considering

their problem.

37. I have also been advised that an analysis of whether a claimed invention would have been obvious should be considered in light of the scope and content of the prior art, the differences (if any) between the prior art and the claimed invention, and the level of ordinary skill in the pertinent art involved. I understand as well that a prior art reference should be viewed as a whole.

38. I have also been advised that in considering whether a claimed invention would have been obvious over a combination of prior art references, I may assess whether there are apparent reasons to combine known elements in the prior art in the manner claimed in view of interrelated teachings of multiple prior art references, the effects of demands known to the design community or present in the marketplace, and/or the background knowledge possessed by a person of ordinary skill in the art. I understand that other principles may be relied on in evaluating whether a claimed invention would have been obvious, and that these principles include the following:

- A combination of familiar elements according to known methods is likely to be obvious when it does no more than yield predictable results;
- When a device or technology is available in one field of endeavor, design incentives and other market forces can prompt variations of it, either in the same field or in a different one, so that if a person of ordinary skill can implement a predictable variation, the variation is likely obvious;
- If a technique has been used to improve one device, and a person of ordinary skill in the art would recognize that it would improve similar

devices in the same way, using the technique is obvious unless its actual application is beyond their skill;

- An explicit or implicit teaching, suggestion, or motivation to combine two prior art references to form the claimed combination may demonstrate obviousness, but proof of obviousness does not depend on or require showing a teaching, suggestion, or motivation to combine;

- Market demand, rather than scientific literature, can drive design trends and may show obviousness;

- In determining whether the subject matter of a patent claim would have been obvious, neither the particular motivation nor the avowed purpose of the named inventor controls whether the claim is obvious;

- One of the ways in which a patent's subject can be proved obvious is by noting that there existed at the time of invention a known problem for which there was an obvious solution encompassed by the patent's claims;

- 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;

- "Common sense" teaches that familiar items may have obvious uses beyond their primary purposes, and in many cases a person of ordinary skill will be able to fit the teachings of multiple patents together like pieces of a puzzle;

- A person of ordinary skill in the art is also a person of ordinary creativity, and is not an automaton;

- A patent claim can be proved obvious by showing that the claimed combination of elements was "obvious to try," particularly when there is a design need or market pressure to solve a problem and there are a finite number of identified, predictable solutions such that a person of ordinary skill in the art would have had good reason to pursue the known options within his or her technical grasp; and

- One should be cautious of using hindsight in evaluating whether a claimed invention would have been obvious.

39. I further understand that, in making a determination as to whether the

claimed invention would have been obvious to a person of ordinary skill, the Board may consider certain objective factors if they are present, such as: commercial success of products practicing the claimed invention; long-felt but unsolved need; teaching away; unexpected results; copying; and praise by others in the field. These factors are generally referred to as "secondary considerations" or "objective indicia" of nonobviousness. I understand, however, that for such objective evidence to be relevant to the obviousness of a claim, there must be a causal relationship (called a "nexus") between the claim and the evidence, and that this nexus must be based on a novel element of the claim rather than something in the prior art. I also understand that even when they are present, secondary considerations may be unable to overcome primary evidence of obviousness (such as motivation to combine with predictable results) that is sufficiently strong.

IV. BACKGROUND OF THE TECHNOLOGY

40. The '219 patent is generally directed to an apparatus for use with a mobile phone, where the apparatus contains smartcard circuitry with a point-of-sale interface that is powered by the mobile phone. '219 patent, 3:52-62, 12:5-14.

41. But the concept of an apparatus with smartcard circuitry including a point-of-sale interface for use in a mobile phone was already known in the art. For example, Fox discloses cellular telephone 10 "incorporates the electronics" for implementing a "single semiconductor integrated circuit 45" (also referred to as

"smartcard 45"), including "smartcard logic function 42." Fox, 3:23-28, 3:46, Figs. 2-3. When used, "a specific transaction within the capability of smartcard logic function 42 may be executed, for example, a point-of-sale transaction, via a merchant's reader." Fox, 5:21-25. Fox's phone further includes a "battery and power conditioner 54" that supplies power to smartcard 45. Fox, 4:3-8, Fig. 2.

42. As I discuss below, the claims of the '219 patent are anticipated by and obvious over the prior art. Further, there were no technological barriers to combining these teachings from the prior art and a person of ordinary skill in the art would have been motivated to combine these teachings and would have understood that the combination would have yielded predictable results.

V. THE '219 PATENT

A. '219 Patent Overview

43. The '219 patent generally relates to an "intelligent electronic device" (e.g., "mobile phone") that internally communicates with an "electronic transaction card." '219 patent, Abstract, 2:16-35. The electronic transaction card includes smartcard circuitry to communicate with a point-of-sale terminal to perform transactions. '219 patent, 3:52-62, 12:5-14. "Electronic transaction card 104 may then be used with a magnetic stripe or smartcard based merchant point-of-sale terminal to effect a transaction." '219 patent, 3:56-59.

44. As shown in Figure 22, the electronic transaction card includes

"**magnetic/smartcard circuitry 2030.**" '219 patent, Fig. 22, 11:49-12:4. **Magnetic/smartcard circuitry 2030** "may include **circuits to produce time-varying magnetic fields or signals compatible with a smart card reader**." '219 patent, 11:8-10, Fig. 22. The electronic transaction device also includes "**volatile memory 2220**" storing "financial transaction data 2222." '219 patent, Fig. 22, 11:58-64. Fig. 23 shows that the electronic card contains a "**point-of-sale interface**" 2358. '219 patent, 12:5-14, Fig. 23.

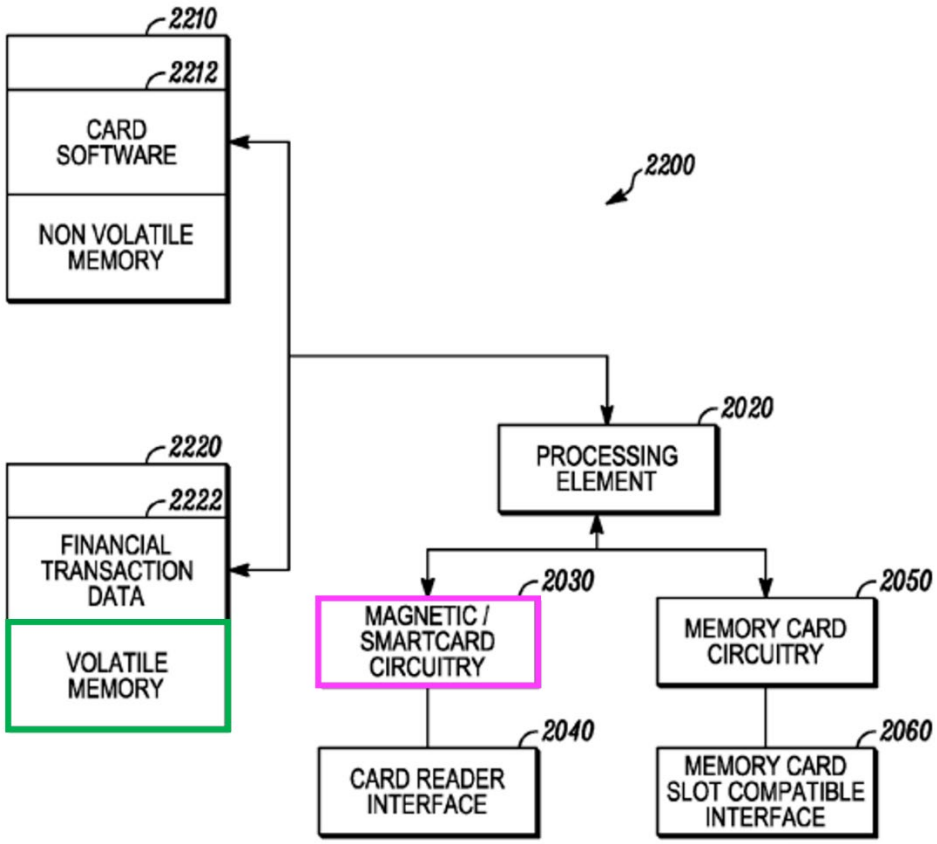


FIG. 22

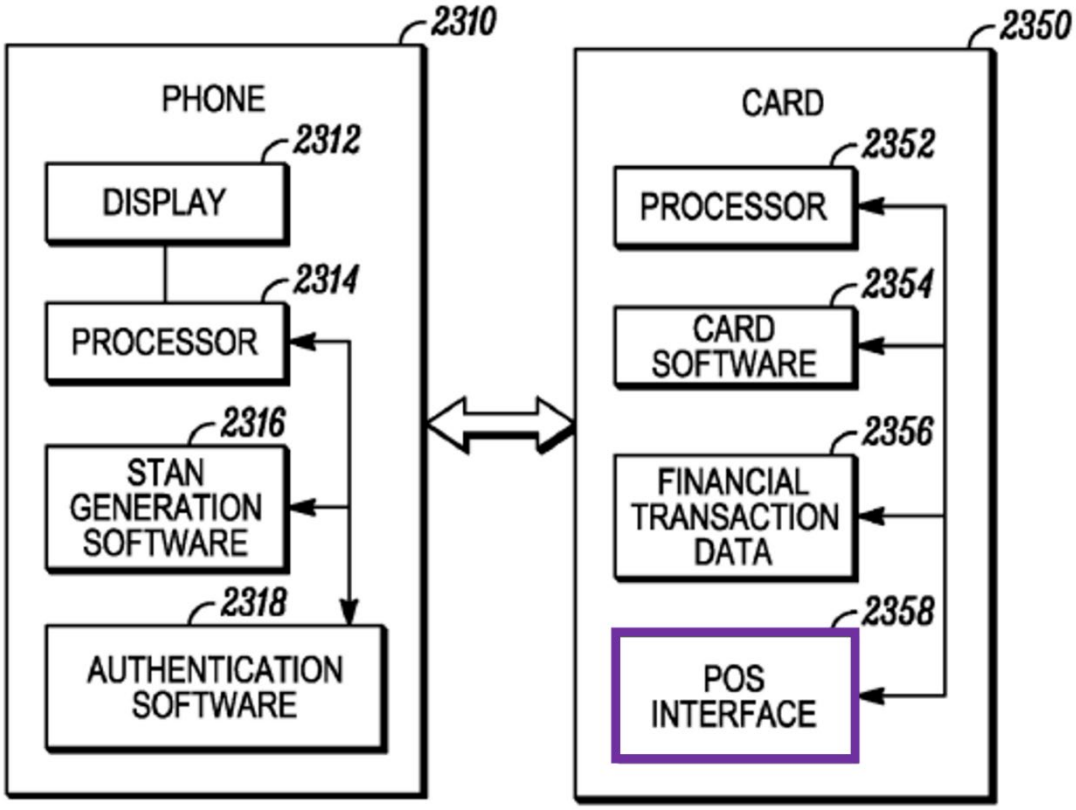


FIG. 23

B. The Prosecution History

45. In formulating my opinions, I also considered the contents of the prosecution history of the ’219 patent. *See* Ex. 1002.

46. The ’219 patent issued from U.S. Pat. App. 13/651,365 (“the ’365 Application”), filed October 12, 2012.

47. During prosecution of the ’365 Application, the Examiner rejected claims 1-20 on the grounds of nonstatutory double patenting over grandparent-patent claims 1-20 of U.S. Patent No. 8,091,786. Ex. 1002, 72. The Examiner found that

the ’786 identically recites Challenged Claims 1-6, except the preamble of the ’786 recites “an add-on card” and not “an apparatus.” *Id.* The Examiner concluded that the narrower “add-on card” anticipated the broader “apparatus” of Challenged Claims 1-6 and the corresponding elements are likewise specified in each respective specification. *Id.*

48. In response, Applicant filed a terminal disclaimer to overcome the nonstatutory obvious-type double patenting rejection over the grandparent patent. Ex. 1002, 84. Applicant did not make any claim amendments. *See id.* The claims were subsequently allowed on February 21, 2013, and the only reason for allowance identified was that the filed terminal disclaimer was “deemed sufficient to overcome the previously issued double patenting rejection.” Ex. 1002, 95, 100.

VI. LEVEL OF ORDINARY SKILL IN THE ART

49. In rendering the opinions set forth in this declaration, I was asked to consider the patent claims and the prior art through the eyes of a person of ordinary skill in the art at the time of the alleged invention. I understand that the factors considered in determining the ordinary level of skill in a field of art include the level of education and experience of persons working in the field; the types of problems encountered in the field, the teachings of the prior art, and the sophistication of the technology at the time of the alleged invention. I understand that a person of ordinary skill in the art is not a specific real individual, but rather is a hypothetical individual

having the qualities reflected by the factors above. I understand that a person of ordinary skill in the art would also have knowledge from the teachings of the prior art, including the art cited below.

50. I have been asked to assume that the Challenged Claims are entitled to the benefit of the February 22, 2005 filing date of the '291 Application filing date.

51. Upon consideration of these factors, and based on my knowledge and experience in the field and my review of the '219 patent and file history, I believe that a person having ordinary skill in the art in this matter would have had at least a Bachelor's degree in electrical engineering, computer engineering, computer science, or the equivalent thereof, and approximately two years of professional experience in the field of electronic devices used for transactions. Additional graduate education could substitute for professional experience, or significant experience in the field could substitute for formal education.

52. Based on my experiences, I have at least the skills of a person having ordinary skill in the art as well as a good understanding of the capabilities of a person having ordinary skill in the art at the time of the '365 Application's filing. To be clear, all of my opinions in this declaration are from the perspective of one of ordinary skill in the art as I have defined it here during the relevant timeframe.

VII. CLAIM CONSTRUCTION

53. I have been instructed that the Challenged Claims of the ’219 patent are to be given their ordinary and customary meaning as understood by one of ordinary skill in the art at the time of the alleged invention in light of the specification and the prosecution history pertaining to the patent. I have followed these principles in my analysis set forth in this document.

54. I understand that presently the parties have not proposed constructions for the ’219 patent in the Samsung Litigation.

VIII. GROUNDS OF UNPATENTABILITY

55. As I explain above in Section IV, the concept of using an electronic transaction card containing smartcard circuitry within a mobile phone to perform transactions was well-known in the art.

56. In this section, I will explain why the teachings or combinations of teachings from the following references anticipate or render obvious each of the Challenged Claims:

Name	Exhibit	Publication	Filed	Published/ Issued
Fox	1009	US5,943,624	6/15/1996	8/24/1999
Takekawa	1020	US2005/0015275	7/14/2004	1/20/2005

I have been instructed to assume that each of these references qualifies as prior art.

57. As I explain below, the Challenged Claims are invalid based upon the following prior art grounds:

- **Ground 1**: Challenged Claims 1-6 of the ’219 patent are anticipated and rendered obvious by Fox.
- **Ground 2**: Challenged Claims 1-6 of the ’219 patent are rendered obvious by Fox in view of Takekawa.

58. It is my opinion that Challenged Claims of the ’219 patent are unpatentable as I explain below. I note that in this discussion, I may focus on the particular language in the specific claims, but it should be understood that my analysis applies to the corresponding elements of all Challenged Claims containing identical or substantially identical language.

IX. SPECIFIC GROUNDS FOR CHALLENGE

59. As I explain above in Section IV, although the ’219 patent purports to have invented the concept of using an electronic transaction card containing smartcard circuitry within a mobile phone to perform transactions, such devices were well-known in the art. As I describe below, the cited prior art provides these teachings.

60. In this section, I explain why claims 1-6 of the ’219 patent are disclosed by Fox, and at least rendered obvious by the teachings of Fox, either alone or in combination with Takekawa. I note that, in this discussion, I may focus on the particular language in specific claims, but it should be understood that my analysis

applies to the corresponding limitations of all claims containing identical or substantially identical language.

A. GROUND 1: Fox (Claims 1-6)

1. Overview of Fox (Ex. 1009, U.S. Patent 5,943,624)

61. Fox discloses "cellular telephone 10," which includes a "single semiconductor integrated circuit 45" for incorporating a "smartcard function therein." Fox, Abstract, 2:60-61, 3:23-36, 4:43-56. The semiconductor integrated circuit includes smartcard circuitry to communicate with a "point-of sale (POS) system" to perform transactions. Fox, 5:1-12.

62. As shown in Figure 2, the "single semiconductor integrated circuit 45" includes "**smartcard RF interface 40**," "**smartcard logic function circuitry 42**," and "**antenna 26**," which are accessible by the mobile phone via "signal line 57." Fox, Fig. 2, Fig. 3, Fig. 5, 2:53-59, 3:23-26, 4:43-56. The "**antenna 26**" allows for the "transmission and reception of RF data." Fox, 2:53-59. The apparatus further comprises memory ("**RAM 43**," "**ROM 45**," and "**EEPROM 47**") which is accessible to the phone via "signal line 57." Fox, Fig. 2, Fig. 3, 3:35-48. The smartcard circuitry receives power from the "**battery and power conditioner 54**" within the mobile phone. Fox, Fig. 2, 3:66-4:8, 5:1-25. The "smartcard RF interface" can communicate with a reader such as a **point-of-sale** system to perform transactions. Fox, 1:66, 3:37, 5:1-25.

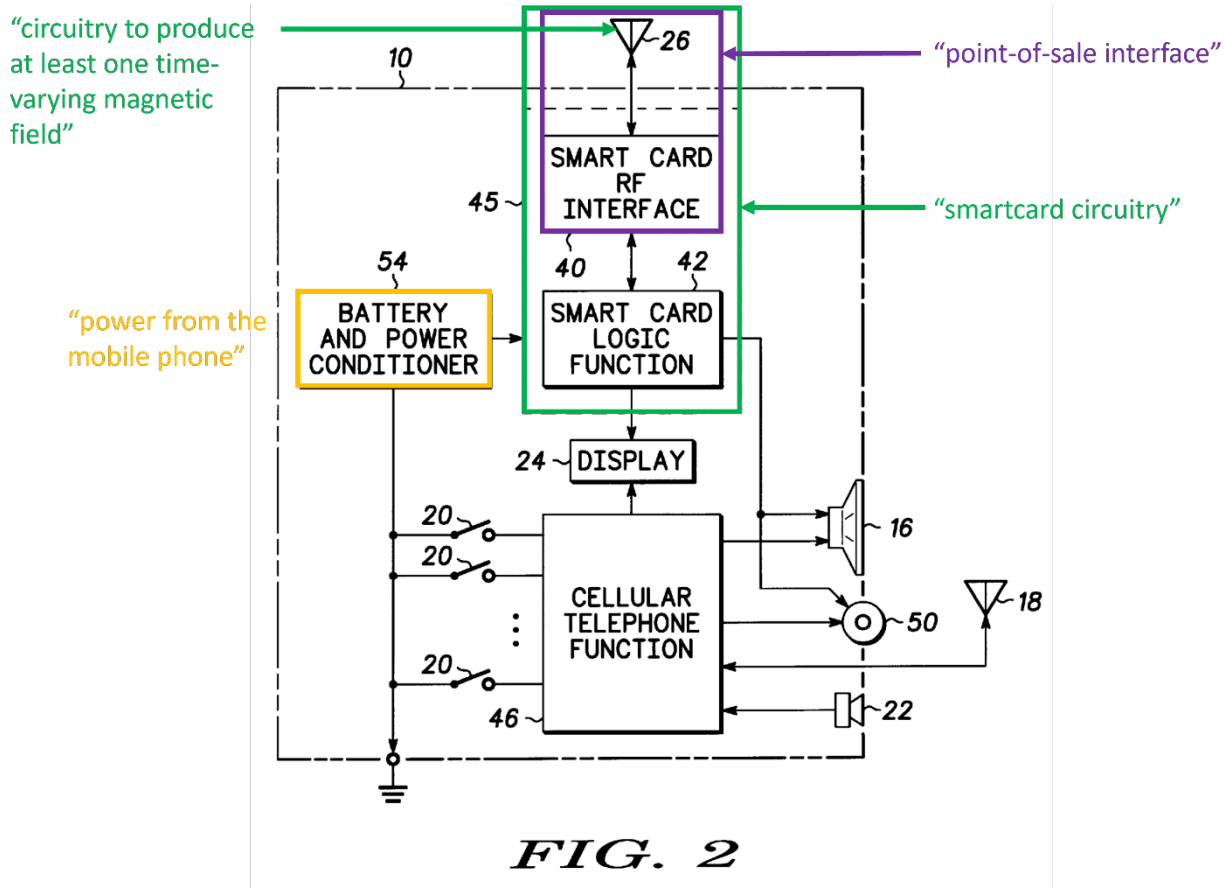


FIG. 2

2. Invalidity of Claims 1-6 Over Fox

63. As I discuss below, Claims 1-6 are disclosed and rendered obvious by Fox. In addition to my discussion in Section IX.A.1, the following discussion identifies example disclosures followed by bulleted excerpts from Fox that each disclose Claims 1-6.

a. Element [1.pre]

64. **Element [1.pre] recites "An apparatus with a compatible interface in a mobile phone."** This element is met by Fox.

65. **To the extent that the preamble is limiting, Fox discloses an apparatus** (*e.g.*, "single semiconductor integrated circuit 45"; "smartcard function

(45)") **with a compatible interface** (*e.g.*, "signal line 57") **in a mobile phone** (*e.g.*, "cellular telephone 10"). *E.g.*, Fox:

- **Fig. 2:**

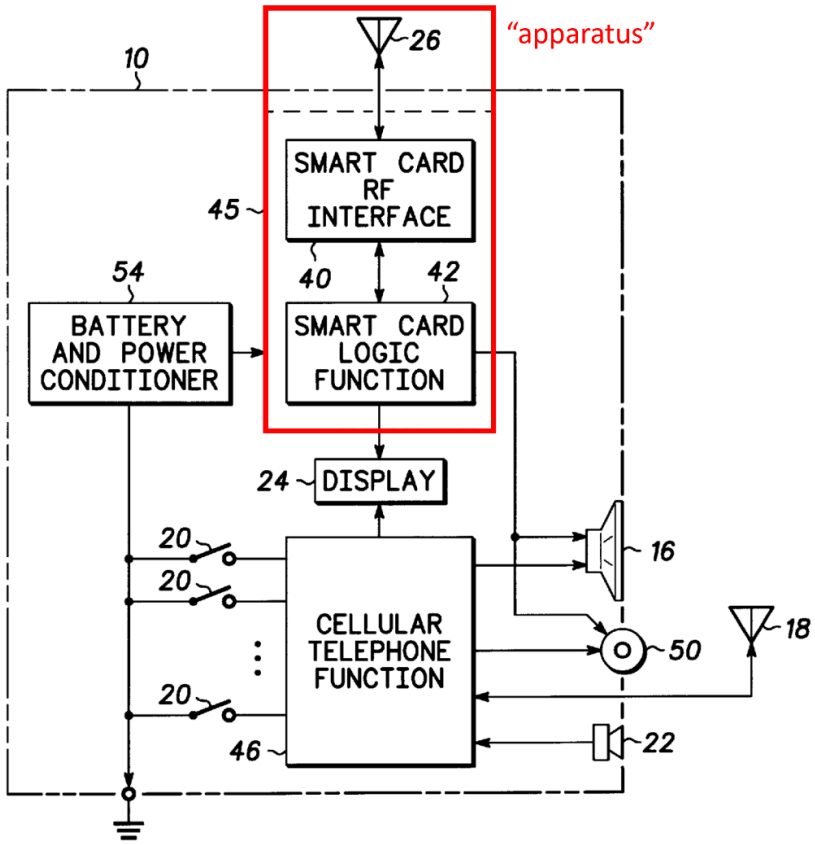


FIG. 2

- **Fig. 3:**

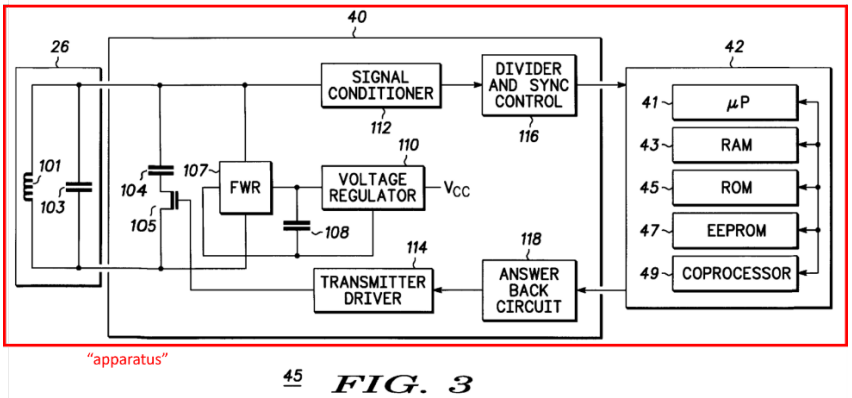


FIG. 3

- **Fig. 5:**

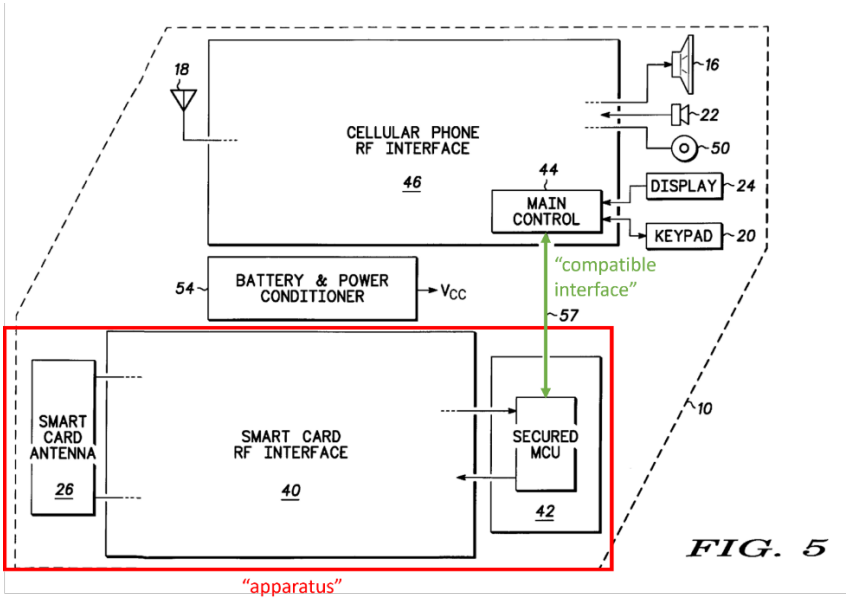


FIG. 5

- **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. The cellular telephone 10 also includes an RF interface (40) for wireless communication between the smartcard and an external reader. Further, by making use of the cellular telephone function, information associated with the smartcard function may be updated or modified via existing cellular telephone infrastructure.

- **3:23-26:** RF interface 40, smartcard circuitry 42 and cellular telephone circuitry 46 may be fabricated on ***a single semiconductor integrated circuit 45*** for achieving greater reliability and reducing overall cost.

- **3:25-46:** ***Referring now to FIG. 3, a more detailed block diagram is shown illustrating the electronic circuitry of antenna 26, smartcard RF interface 40 and smartcard circuitry 42. Smartcard circuitry 42 includes*** microprocessor unit (MPU) 41, random access memory (RAM) 43, read-only memory (ROM)45 and ***electrically erasable read-only memory (EEPROM) 47***, and coprocessor 200 for accomplishing various smartcard functions wherein MPU 41 executes instruction stored on ROM 45 and temporarily stores data on RAM 43 and ***wherein EEPROM 47 is a non-***

volatile memory which may be used for storing data identifying the uniqueness of smartcard 45.

- **4:43-56:** Referring to FIG. 5, a detailed block diagram illustrating the electronic circuitry of cellular telephone circuitry 46 of FIG. 4 and smartcard circuitry 42 of FIG. 3 combined to form a cellular telephone for implementing both cellular telephone and smartcard functions. It is understood that components shown in FIG. 5 that are identical to components shown in FIGS. 3 and 4 are identified by the same reference numbers. ***Signal line 57, which couples main control 44 of cellular telephone circuitry 46 to smartcard circuitry 42, provides a means for MPU 41 to communicate with main control (MPU) 44 for performing both cellular telephone and smartcard functions. Alternately, the functions of main control 44 and MPU 41 of smartcard logic function 42 may be combined into one single MPU.***

66. Fox discloses that cellular telephone 10 "incorporates the electronics" for implementing "a smartcard function (45)." Abstract. For example, Fox shows in Figure 3 that "antenna 26, smartcard RF interface 40 and smartcard circuitry 42" are part of "smartcard 45." 3:35-45. Fox also discloses that "[s]ignal line 57…couples main control 44 of cellular telephone circuitry 46 to smartcard circuitry 42," which provides an interface "means for MPU [(microprocessor unit)] 41 to communicate with main control (MPU) 44 for performing both cellular telephone and smartcard functions." 4:43-56, Figs. 2, 3, 5.[1]

[1] In my opinion, Fox's disclosure of a cellular telephone that self-contains an apparatus is consistent with iCashe's infringement contentions, which map "an apparatus" to a non-removable "NFC chip, i.e., an NXP SN110U V3 NFC and

67. In my opinion, to the extent that it is argued that it is required that the apparatus be removable, it would have been obvious to a person of ordinary skill in the art to make Fox's smartcard functionality removable to advantageously allow a user who purchases a new mobile device to use the functionality and information stored on the smartcard with the new mobile device. For example, U.S. Patent App. Pub. 2007/0026893 (filed on October 22, 2004) discloses that, when an IC card is "detachably connected with the mobile telephone terminal," "user information regarding the NFC function and user information stored in a mobile phone can be easily transferred and replaced." Ex. 1033, [0014]. In this regard, a person of ordinary skill in the art would have understood that "IC card" is interchangeable with "smartcard" and at minimum would have found it obvious that an IC card could execute the smartcard functionality disclosed in **Fox** given its overlapping functionality. For example, the terms "integrated circuit card" and "smart card" are consistently used interchangeably as alternatives for the same thing. *See, e.g.*, Ex. 1024 (U.S. Patent App. Pub. 2004/0146066 (filed on February 14, 2002)), [0001] ("The invention relates to a new type of electronic IC (integrated circuit) card (also known as a smart card or chip card)…"); Ex. 1025 (U.S. Patent App. Pub.

Secure Element chip ("SN110U") and its associated antenna." Ex.1014, Appx.E, 3-4.

2003/0168515 (filed on April 7, 2003 and published September 11, 2003)), [0003] ("The present invention relates generally to electronic devices, and more particularly to an electronic integrated circuit card, i.e., smart card…"); Ex. 1026 (U.S. Patent App. Pub. 2006/0056216 (filed February 16, 2004)), [0001] ("The invention relates to Intelligent portable objects commonly known as smart cards or Integrated circuit (IC) cards."). Additionally, in a 2002 technical article published by the well-known Communications of the ACM Journal (that would have been accessible to a person of ordinary skill in the art, e.g., through a library or a bookstore) titled "Smart Card Evolution," Katherine M. Shelfer and J. Drew Procaccino discuss that IC cards are frequently referred to as smartcards. Ex. 1019, 83 ("[T]he IC card, later dubbed the "smart card"").

b. Element [1.a]

68. **Element [1.a] recites "the apparatus including smartcard circuitry accessible by the mobile phone."** This element is met by Fox.

69. **Fox discloses the apparatus** (*e.g.*, "single semiconductor integrated circuit 45"; "smartcard function (45)") **including smartcard circuitry** (*e.g.*, "smartcard RF interface" 40, "smartcard logic function circuitry 42," and "antenna 26") **accessible by the mobile phone** (*e.g.*, accessible by "cellular telephone 10" via "signal line 57"). *E.g.*, Fox:

- **Fig. 2:**

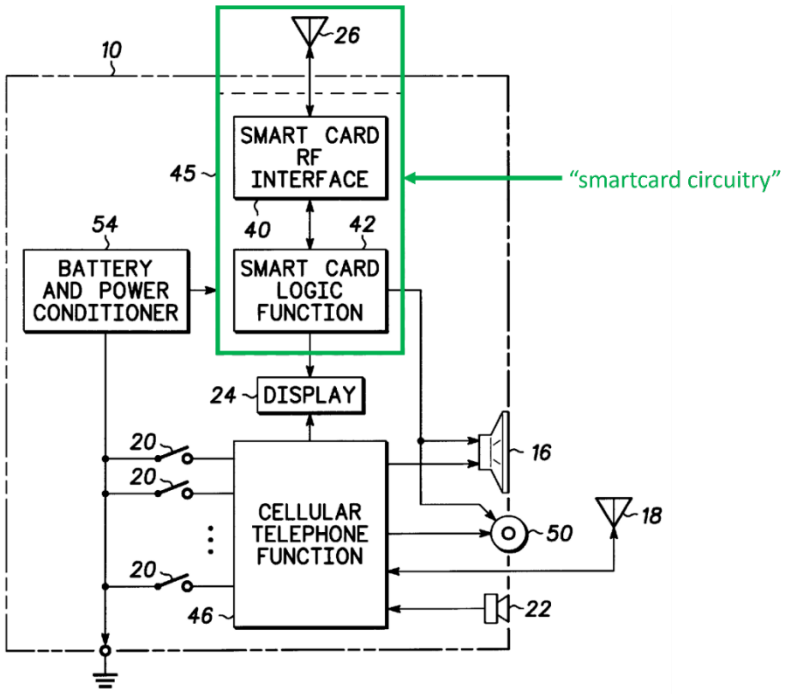


FIG. 2

- **Fig. 3:**

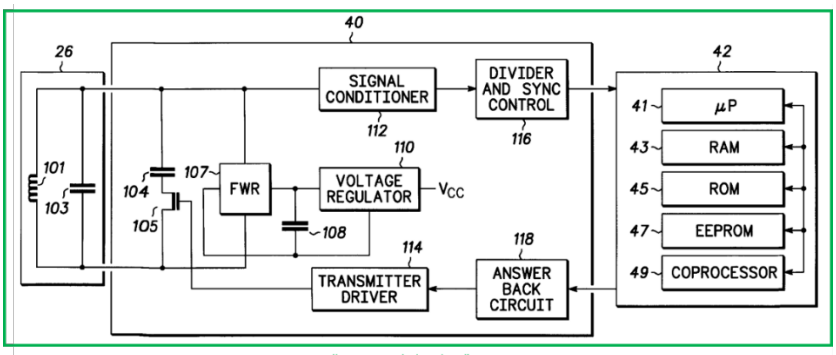


FIG. 3

- **Fig. 5:**

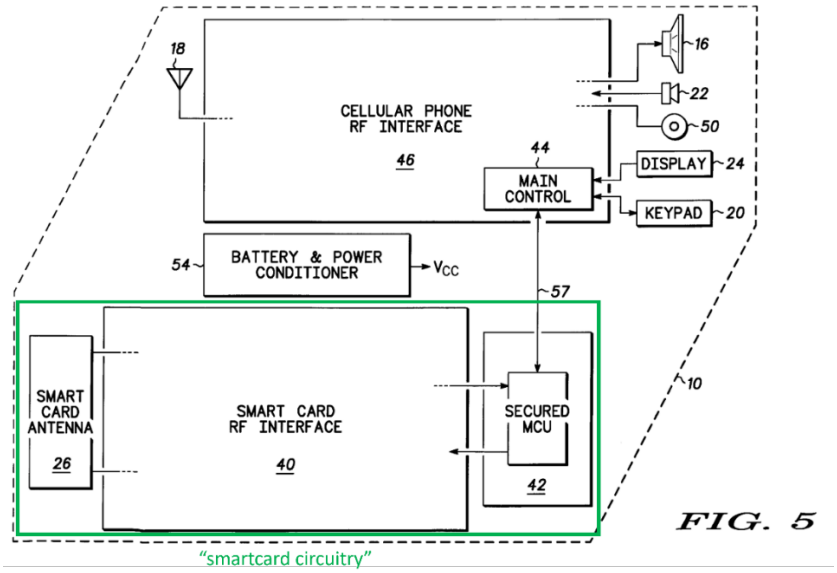


FIG. 5

- **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. The cellular telephone 10 also includes an RF interface (40) for wireless communication between the smartcard and an external reader. Further, by making use of the cellular telephone function, information associated with the smartcard function may be updated or modified via existing cellular telephone infrastructure.

- **2:53-59:** ***Cellular telephone 10 of FIG. 2 includes smartcard radio-frequency (RF) interface 40 coupled to antenna 26 for transmission and reception of RF data.*** The transmission/reception of RF data is utilized for performing and executing various smartcard functions while not suffering from the problems described earlier with respect to smartcard contact interfaces.

- **3:23-26:** "***RF interface 40, smartcard circuitry 42 and cellular telephone circuitry 46 may be fabricated on a single semiconductor integrated circuit 45*** for achieving greater reliability and reducing overall cost."

- **4:43-56:** Referring to FIG. 5, a detailed block diagram illustrating the electronic circuitry of cellular telephone circuitry 46 of FIG. 4 and smartcard circuitry 42 of FIG. 3 combined to form a cellular telephone for implementing both cellular telephone and smartcard functions. It is understood that components shown in FIG. 5 that are identical to

components shown in FIGS. 3 and 4 are identified by the same reference numbers. ***Signal line 57, which couples main control 44 of cellular telephone circuitry 46 to smartcard circuitry 42, provides a means for MPU 41 to communicate with main control (MPU) 44 for performing both cellular telephone and smartcard functions. Alternately, the functions of main control 44 and MPU 41 of smartcard logic function 42 may be combined into one single MPU.***

- **4:56-67:** Main control 44 of cellular telephone function 46 and smartcard logic function 42 provide appropriate signals to display 24 and speaker 16 for accomplishing cellular telephone and smartcard functions, respectively. For example, main control 44 may provide the currently-dialed telephone number on display 24 and may provide a signal to speaker 16 to generate a ringing sound upon receiving an incoming call. Moreover, ***smartcard logic function 42 may provide information associated with the smartcard functions, such as current balance, for display on display 24***, and may provide audible tone or mechanical vibrations during the smartcard transaction.

70. See my discussion of elements [1.pre] above (Section IX.A.2.a).

71. Fox further discloses that "single semiconductor integrated circuit 45" (also referred to as "smartcard 45") includes "smartcard RF interface 40," "smartcard logic function 42," and "antenna 26," which comprise circuitry for performing smartcard functionality. 3:23-26, 3:46, Figs. 2-3. As illustrated in Figure 5, "[s]ignal line 57, which couples main control 44 of cellular telephone circuitry 46 to smartcard circuitry 42, provides a means for MPU 41 to communicate with main control (MPU) 44 for performing both cellular telephone and smartcard functions." 4:43-56, Fig. 5. Moreover, main control 44 is coupled to smartcard circuitry 42 by signal line 57 to perform smartcard functions. 4:43-56. For example, smartcard logic function 42 may provide a signal to display 24 via main control 44 to display

information, such as a "current balance." 4:57-67.

c. Element [1.b]

72. **Element [1.b] recites "the smartcard circuitry including a point-of-sale interface to communicate with a point-of-sale terminal."** This element is met by Fox.

73. **Fox discloses the smartcard circuitry** (*e.g.*, "smartcard RF interface" 40, "smartcard logic function circuitry 42," and "antenna 26") **including a point-of-sale interface** (*e.g.*, "smartcard RF interface 40" and "antenna 26") **to communicate with a point-of-sale terminal** (*e.g.*, "point-of-sale (POS) system"). *E.g.*, Fox:

- **Fig. 2:**

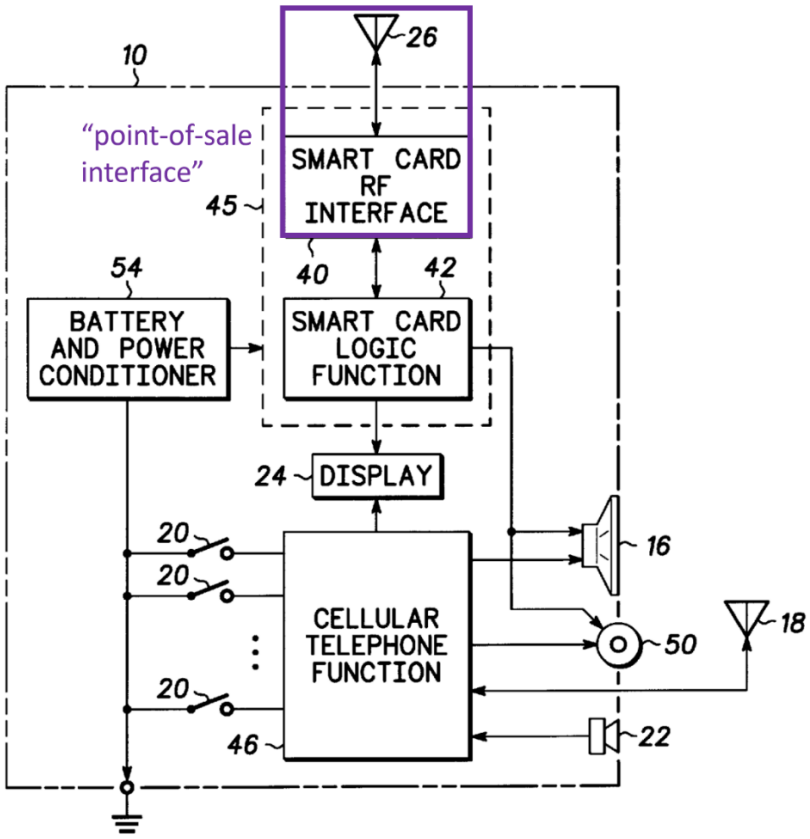


FIG. 2

- **Fig. 3:**

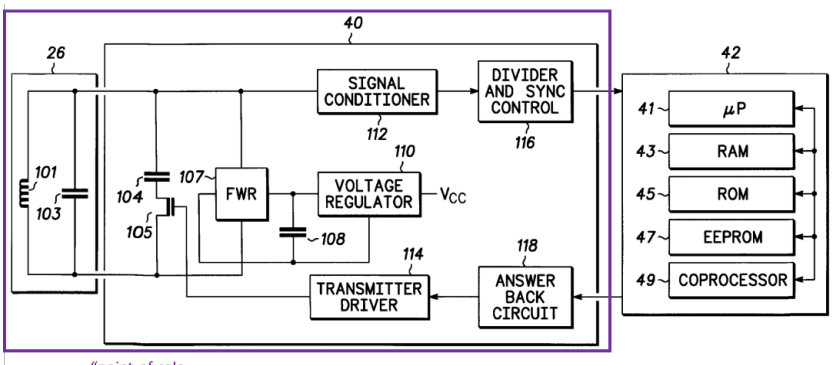


FIG. 3

- **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. ***The cellular telephone***

10 also includes an RF interface (40) for wireless communication between the smartcard and an external reader. Further, by making use of the cellular telephone function, information associated with the smartcard function may be updated or modified via existing cellular telephone infrastructure.

- **2:53-59:** ***Cellular telephone 10 of FIG. 2 includes smartcard radio-frequency (RF) interface 40 coupled to antenna 26 for transmission and reception of RF data.*** The transmission/reception of RF data is utilized for performing and executing various smartcard functions while not suffering from the problems described earlier with respect to smartcard contact interfaces.

- **2:60-63:** ***Interface 40 is coupled to smartcard logic function circuitry 42*** (or simply smartcard circuitry), whereby smartcard circuitry 42 includes electronics, as shown in more detail in FIG. 3, f***or performing various smartcard functions.***

- **3:35-48:** Referring now to FIG. 3, a more detailed block diagram is shown illustrating the electronic circuitry of antenna 26, ***smartcard RF interface 40*** and smartcard circuitry 42. ***Smartcard circuitry 42 includes*** microprocessor unit (MPU) 41, random access memory (RAM) 43, read-only memory (ROM)45 and ***electrically erasable read-only memory (EEPROM) 47***, and coprocessor 200 for accomplishing various smartcard functions wherein MPU 41 executes instruction stored on ROM 45 and temporarily stores data on RAM 43 and ***wherein EEPROM 47 is a non-volatile memory which may be used for storing data identifying the uniqueness of smartcard 45***.

- **5:1-12:** Generally, ***the smartcard function within cellular telephone 10 is interrogated or updated by a smartcard infrastructure using an RF field that is received by the integral smartcard antenna 26*** whereby antenna 26 may be the same or separate from antenna 18 associated with the cellular telephone function. Likewise, data from the smartcard is also transferred to the infrastructure using the same antenna. For example, ***a smartcard infrastructure may be an external system such as an RF card reader associated with a banking institution for performing ATM transactions, or a point-of-sale (POS) system associated with a merchant for performing a sales transaction***.

- **5:13-25:** ***When a user desires to initiate a smartcard function with a corresponding RF reader, the user may, for example, cause cellular telephone 10 to come into the RF power range associated with RF interface 40 so that communication between the reader and cellular telephone 10 may be facilitated***. At that point, some initial handshaking may be performed and the reader may then prompt the user to enter a PIN, via selector buttons 20, to ensure that the proper person is in possession of cellular telephone 10. ***From there, a specific transaction within the capability of smartcard logic function 42 may be executed, for example, a point-of-sale transaction, via a merchant's reader, or the transfer of funds, via an automated teller machine (ATM).***

74. See my discussion of elements [1.a] above (Section IX.A.2.b).

75. Fox further discloses that the smartcard function fabricated on the "single semiconductor integrated circuit 45 includes a "smartcard RF interface 40," and "antenna 26." 3:35-48, 2:60-63, Figs. 2-3. Smartcard (RF) interface 40 coupled to antenna 26 are used "for transmission and reception of RF data" for "performing and executing various smartcard functions." 2:53-59.

76. **Fox** discloses smartcard RF interface 40 and antenna 26 interact with a point-of-sale terminal. For example, **Fox** discloses that, during operation, "the smartcard function within cellular telephone 10 is interrogated…by a smartcard infrastructure using an RF field that is received by the integral smartcard antenna 26." 5:1-5. The "smartcard infrastructure" is, for example, "an RF card reader associated with…a point-of-sale (POS) system associated with a merchant for performing a sales transaction." 5:8-12. When the user wants to interact with the reader, the user "cause[s] cellular telephone 10 to come into the RF power range

associated with RF interface 40 so that communication between the reader and cellular telephone 10 may be facilitated." 5:13-25. "From there, a specific transaction within the capability of smartcard logic function 42 may be executed, for example, a point-of-sale transaction, via a merchant's reader." 5:21-25.

d. Element [1.c]

77. **Element [1.c] recites "wherein the point-of-sale interface receives power from the mobile phone."** This element is met by Fox.

78. **Fox discloses the point-of-sale interface** (*e.g.*, "smartcard RF interface 40" and "antenna 26") **receives power from the mobile phone** (*e.g.*, receives power from "battery and power conditioner 54"). *E.g.*, Fox:

- **Fig. 2:**

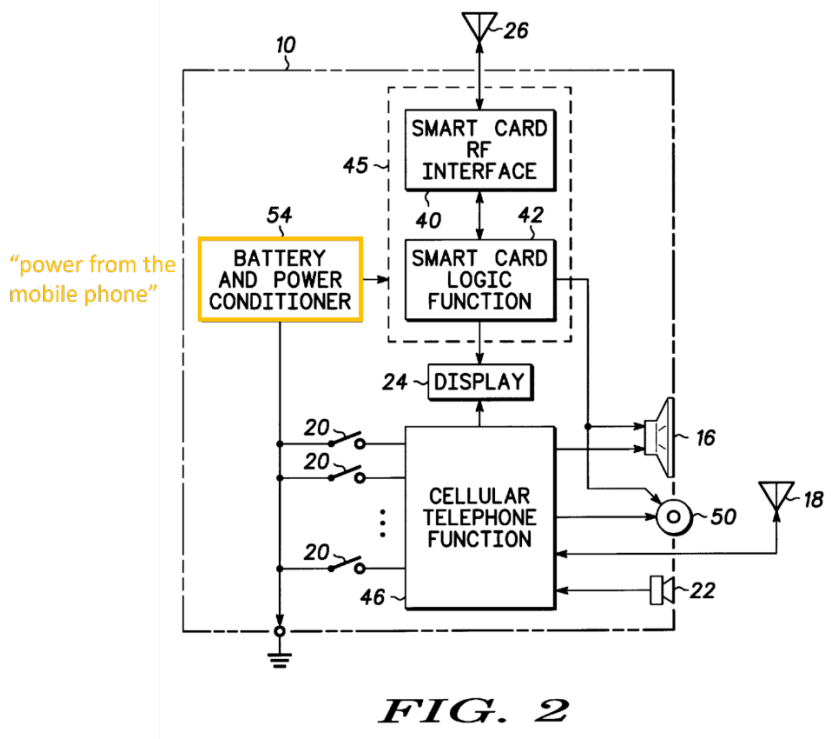


FIG. 2

- **4:3-8:** Referring now to FIG. 4, a more detailed block diagram is shown illustrating the electronic circuitry of cellular circuitry 46 and battery and power conditioner 54 of FIG. 2. ***Cellular telephone circuitry 46 is powered via battery and power conditioner 54*** which comprises a battery 130 and a power control 132.

79. See my discussion of elements [1.pre] and [1.b] above (Sections IX.A.2.a and c).

80. As illustrated in Figure 2, Fox further discloses "battery and power conditioner 54" provides power to various components in the phone, including smartcard 45 (including the smartcard RF interface 40 and antenna 26) and cellular telephone circuitry 46. Fig. 2. Fox further explains battery and power conditioner 54 "comprises a battery 130 and a power control 132," and illustrates that the power is provided by battery 130 via the power control 132. 4:3-8, Fig. 4.

81. As such, in my opinion, a person of ordinary skill in the art would have understood, or at minimum found it obvious, that Fox's smartcard RF interface 40 and antenna 26 receive power from the cellular telephone 10 via the "power control 132" to advantageously power the components. For example, U.S. Patent No. 6,012,634 (issued January 11, 2000) discloses the "interconnection" of a "smart memory card" and "cellular telephone" with "five conductors," including "a power regulated voltage level and . . . ground," and a "power conductor . . . [to] communicate with the processor for a smartcard compatible device." Ex. 1039, 3:17-34.

e. Claim 2

82. **Claim 2 recites "The apparatus of claim 1 wherein the point-of-sale interface comprises circuitry to produce at least one time-varying magnetic field."** This element is met by Fox.

83. See my discussion of the elements of claim 1 above (Sections IX.A.2.a-d). **Fox discloses the apparatus of claim 1 wherein the point-of-sale interface** (*e.g.*, "smartcard RF interface 40 coupled to antenna 26") **comprises circuitry** (*e.g.*, "answer back circuit 118," "transmitter driver 114" and "antenna 26") **to produce at least one time-varying magnetic field** (*e.g.*, "transmission and reception of RF data"). *E.g.*, Fox:

- **Fig. 2:**

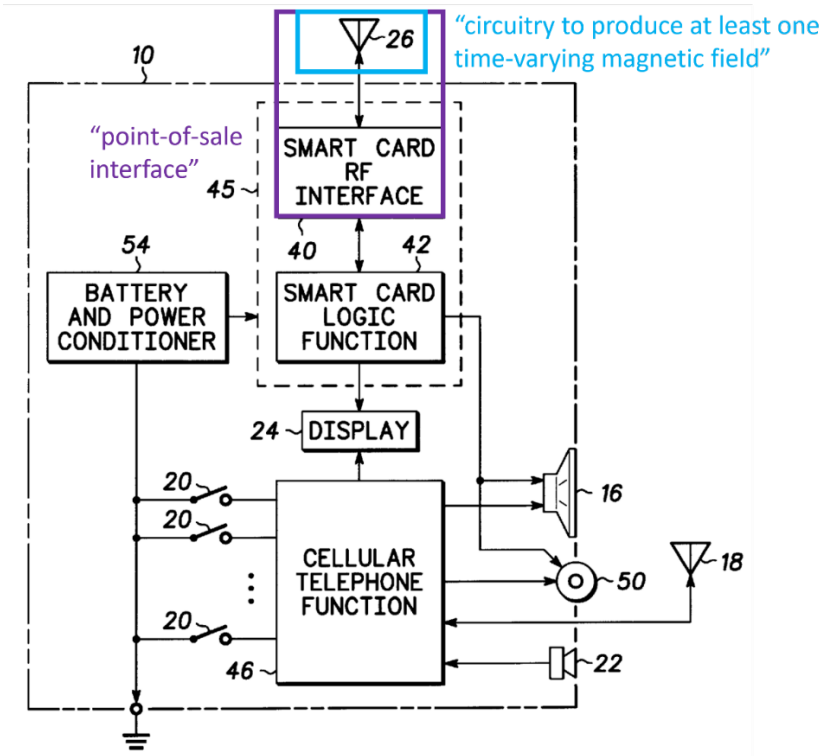


FIG. 2

- **2:53-59:** ***Cellular telephone 10 of FIG. 2 includes smartcard radio-frequency (RF) interface 40 coupled to antenna 26 for transmission and reception of RF data.*** The transmission/reception of RF data is utilized for performing and executing various smartcard functions while not suffering from the problems described earlier with respect to smartcard contact interfaces.

- **3:49-59:** Smartcard antenna 26 may take the form, for example, of capacitor 103 and a wire such as inductor 101. These two components form a tuned circuit that is resonant at the desired frequency of information and/or power transmission into the smartcard. ***The resonance is modified by the capacitor 104 and FET switch 105 under control of the logic function 42 via the answer back circuit 118 and transmitter driver 114, when information is transmitted out of the smartcard. The answer back circuit 118 receives the digital message from 42, formats and encodes it for RF transmission***.

84. See my discussion of element [1.b] above (Section IX.A.2.c).

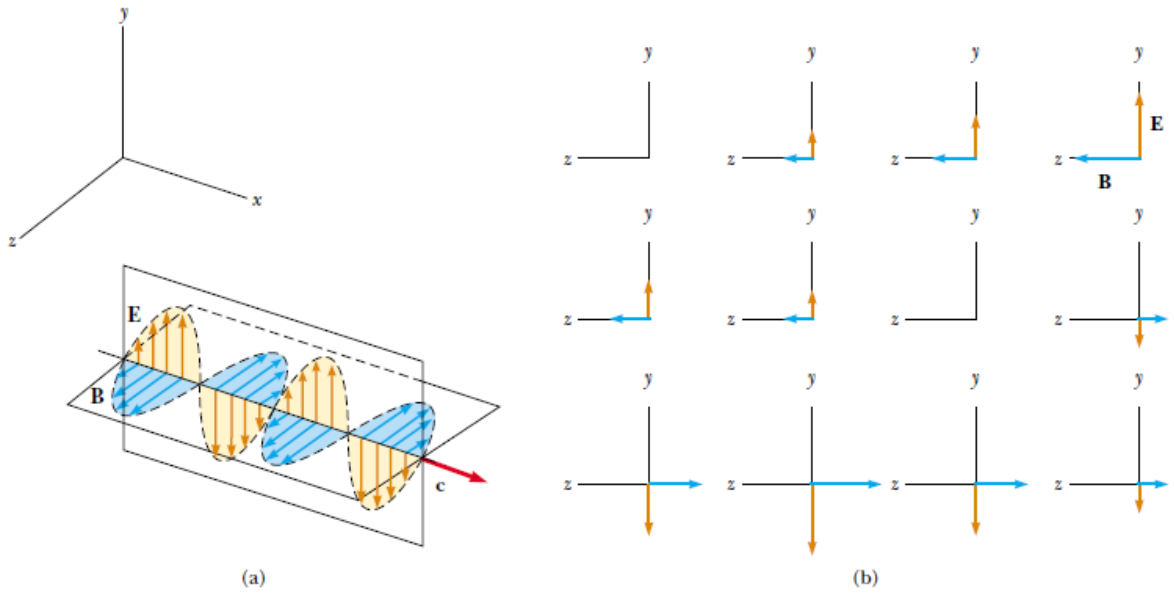
85. As shown in Figure 3, Fox discloses that "cellular telephone 10 of FIG.

2 includes smartcard radio-frequency (RF) interface 40 coupled to antenna 26 for transmission and reception of RF data." 2:53-59. The smartcard RF interface 40 includes an answer back circuit 118 that receives a message from smartcard logic function 42, formats and encodes it for RF transmission, and provides the signal to transmitter driver 114 to drive the antenna 26. 3:53-59.[2]

86. In my opinion, a person of ordinary skill in the art would have understood that Fox's disclosure of RF data that is transmitted and received creates a time-varying magnetic field. For example, the 1st edition of "RFID Handbook" (a well-known reference for smartcard and RFID applications published in 1999, which was readily available in bookstores and libraries) explains that RFID systems use electromagnetic fields, which include a "magnetic field" that "varies over time." Ex. 1034, 53, 102. Similarly, the 6th edition of "Physics for Scientists and Engineers" (a physics textbook published in 2004, which was readily available in bookstores and libraries), describes radio waves and other electromagnetic waves. These books describe that an RF transmission creates a time-varying magnetic field. This is

[2] This is consistent with iCashe's infringement contentions, which identify the transmission of a 13.56 MHz RF signal as a time-varying magnetic field. Ex. 1014, Appx.E, 61 ("The NFC antenna element produces a time-varying magnetic field, i.e., a 13.56 MHz alternating current.").

because radio waves are a form of electromagnetic wave that operates at particular frequencies. *See* Ex. 1034 at 53; *see also* Ex. 1040 at 198. Electromagnetic waves consist of perpendicular electronic and magnetic fields that are coupled to each other and that vary over time. Ex. 1040 at 1070-71; *see also* Ex. 1034 at 102 (explaining that electromagnetic waves are a chain of time-varying electronic and magnetic fields). In the illustration below of an electromagnetic wave traveling in the x-direction, "E" is the time-varying electric field (in the y-direction) and "B" is the time varying magnetic field (in the z-direction):



Ex. 1040 at 1071, Fig. 34.3 (illustrating in (a) the wave at an instant in time moving with velocity c, and (b) a time sequence of the electric and magnetic field vectors at a fixed position in the yz-plane).

f. Claim 3

87. **Claim 3 recites "The apparatus of claim 2 further comprising**

memory accessible by the mobile phone." This element is met by Fox.

88. See my discussion of the elements of claims 1 and 2 above (Sections IX.A.2.a-e). **Fox discloses the apparatus further comprising memory** (*e.g.*, "RAM 43," "ROM 45," and "EEPROM 47") **accessible by the mobile phone** (*e.g.*, accessible by "main control 44" of "cellular telephone 10" via "signal line 57"). *E.g.*, Fox:

- **Fig. 2:**

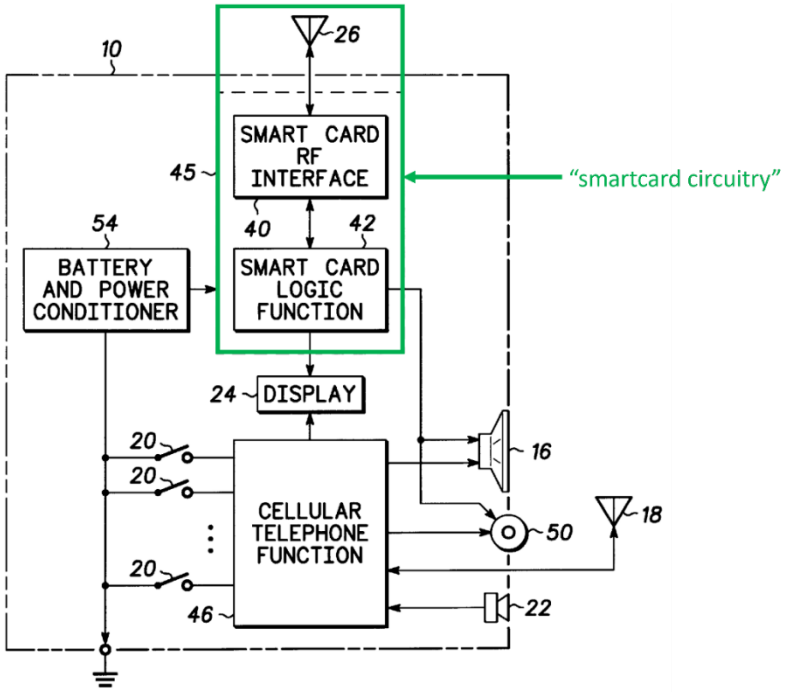
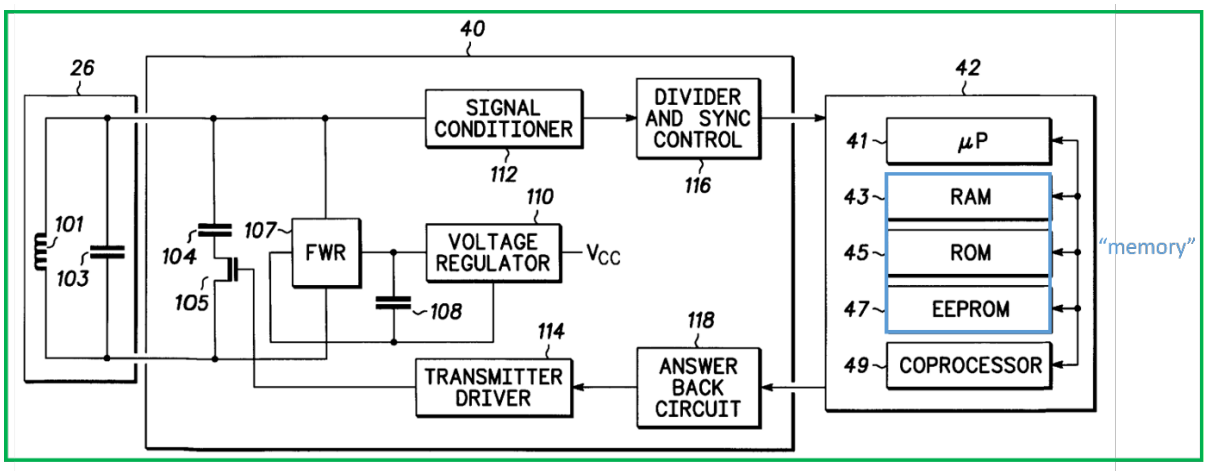


FIG. 2

- **Fig. 3:**



45 FIG. 3

- **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. The cellular telephone 10 also includes an RF interface (40) for wireless communication between the smartcard and an external reader. Further, by making use of the cellular telephone function, information associated with the smartcard function may be updated or modified via existing cellular telephone infrastructure.

- **3:23-26:** RF interface 40, ***smartcard circuitry 42*** and cellular telephone circuitry 46 may be fabricated on ***a single semiconductor integrated circuit 45*** for achieving greater reliability and reducing overall cost.

- **3:35-48:** Referring now to FIG. 3, a more detailed block diagram is shown illustrating the electronic circuitry of antenna 26, smartcard RF interface 40 and smartcard circuitry 42. ***Smartcard circuitry 42 includes microprocessor unit (MPU) 41, random access memory (RAM) 43, read-only memory (ROM) 45 and electrically erasable read-only memory (EEPROM) 47***, and coprocessor 200 for accomplishing various smartcard functions wherein MPU 41 executes instruction stored on ROM 45 and temporarily stores data on RAM 43 and wherein EEPROM 47 is a non-volatile memory which may be used for storing data identifying the uniqueness of smartcard 45. And wherein coprocessor 49 executes security

algorithms used to verify the identity of the smartcard and the smartcard infrastructure.

- **5:39-43:** For example, cellular telephone function 46 may access, via the cellular telephone infrastructure, ***a banking institution while main control 44 communicates with MPU 41 for allowing electronic cash to be downloaded onto the smartcard***.

- **5:48-60:** By now it should be apparent that a novel cellular telephone has been provided that incorporates the electronics for implementing both a cellular telephone function and a smartcard function. This allows the smartcard electronic circuitry 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. The cellular telephone also includes an RF interface for wireless communication between the smartcard and an external reader. Further, by making use of the cellular telephone function, ***information associated with the smartcard function may be updated or modified via existing cellular telephone infrastructure***.

89. See my discussion of element [1.pre] above (Section IX.A.2.a).

90. Fox further discloses that the "smartcard 45" includes "smartcard circuitry 42" (also referred to as "smartcard logic function 42" in Figure 2). Abstract, 3:23-26, Figs. 2, 3. Fox discloses that smartcard logic function 42 includes memory. Figs. 2, 3, 3:35-48. Specifically, as shown in annotated Figure 3 below, smartcard logic function 42 includes random access memory ("RAM 43"), read-only memory ("ROM 45") and electrically erasable read-only memory ("EEPROM 47"). Figs. 2-3, 3:35-48. Fox further discloses that "information associated with the smartcard function may be updated or modified via existing cellular telephone infrastructure." 5:48-60. The purpose of memory is to store information, and thus, the information associated with the smartcard function would be understood to be stored in memory,

and that information would be accessed to be updated or modified by the cellular function 46 in the phone based on information received over a cellular telephone network. Moreover, Fox discloses that "cellular telephone function 46 may access, via cellular telephone infrastructure, a banking institution while main control 44 communicates with MPU 41 for allowing electronic cash to be downloaded onto the smartcard." Fox, 5:39-43. When downloading information onto the smartcard, the MPU 41 would take the information obtained over the cellular network and would access the memory (either directly or via the coprocessor 49 or microprocessor 41) so as to store the information in the memory of the smartcard. In view of these disclosures, a person of ordinary skill in the art would have understood that the memory within smartcard function 45 is accessible by cellular telephone 10 (either directly or via MPU 41).

g. Claim 4

91. **Claim 4 recites "The apparatus of claim 1 wherein the point-of-sale interface includes circuitry compatible with a hybrid smartcard reader."** This element is met by Fox.

92. See my discussion of the elements of claim 1 above (Sections IX.A.2.a-d). **Fox discloses that the point-of-sale interface** (*e.g.*, "smartcard radio frequency (RF) interface 40 coupled to antenna 26") **includes circuitry compatible with a hybrid smartcard reader** (*e.g.*, external "RF card reader" that is compatible with

both contact-based and contactless transmissions). *E.g.*, Fox:

- **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. ***The cellular telephone 10 also includes an RF interface (40) for wireless communication between the smartcard and an external reader.*** Further, by making use of the cellular telephone function, information associated with the smartcard function may be updated or modified via existing cellular telephone infrastructure.

- **1:9-30:** Smartcards are fast becoming the common media to transfer information of many types relative to banking, transportation, subscriber, health, identification, etc. Typically, smartcards are housed within a plastic card, taking the form and size, for example, of a plastic credit card. Such smartcards include a microcomputer having some form of memory for storing and processing data. When a transaction within the capability of the smartcard is to be performed, the smartcard interacts with an external system which may be, for example, an automated teller machine, a merchant's point of sale system, etc. ***In performing such a transaction, typically the smartcard is inserted into a card reader associated with the external system through which electrical contact is made between the card reader and the smartcard. However, such systems requiring the smartcard to come into contact with the external system suffer from the disadvantages that the smartcard must be physically inserted into the external reader***, the contacts between the smartcard and the external reader must be aligned for proper signal transfer, and the contacts may become worn or dirty thereby causing unreliability through signal degradation or signal interruption.

- **2:10-29:** "Referring to FIG. 1, a pictorial diagram is shown illustrating the conceptual idea of incorporating a smartcard and its associated functions within cellular telephone 10. Cellular telephone 10 includes cellular telephone circuitry and smartcard circuitry (shown in block form in FIG. 2 and in detailed block form in FIGS. 3 and 4) for performing both a cellular telephone function and a smartcard function. The circuitry for accomplishing the smartcard function includes an RF interface and smartcard logic function circuitry. ***The RF interface provides a***

contactless interface between the smartcard logic function circuitry in telephone 10 and an external reader/system. This integration of a contactless smartcard into a cellular telephone function provides ease of use of the smartcard, enhanced security from theft or loss, the ability to read and access information stored within the smartcard by utilizing the cellular telephone display for displaying available smartcard functions, and the ability to update/change information stored within the smartcard by utilizing the cellular telephone functions to electronically communicate with an external system."

- **2:53-59:** Cellular telephone 10 of FIG. 2 includes smartcard radio-frequency (RF) interface 40 coupled to antenna 26 for ***transmission and reception of RF data***. The transmission/reception of RF data is utilized ***for performing and executing various smartcard functions while not suffering from the problems described earlier with respect to smartcard contact interfaces***.

- **5:1-12:** Generally, the smartcard function within cellular telephone 10 is interrogated or updated by a smartcard infrastructure using an RF field that is received by the integral smartcard antenna 26 whereby antenna 26 may be the same or separate from antenna 18 associated with the cellular telephone function. Likewise, data from the smartcard is also transferred to the infrastructure using the same antenna. ***For example, a smartcard infrastructure may be an external system such as an RF card reader associated with a banking institution for performing ATM transactions, or a point-of-sale (POS) system associated with a merchant for performing a sales transaction.***

- **5:13-25:** When a user desires to initiate a smartcard function with a corresponding RF reader, the user may, for example, cause cellular telephone 10 to come into the RF power range associated with RF interface 40 so that communication between the reader and cellular telephone 10 may be facilitated. At that point, some initial handshaking may be performed and the reader may then prompt the user to enter a PIN, via selector buttons 20, to ensure that the proper person is in possession of cellular telephone 10. From ***there, a specific transaction within the capability of smartcard logic function 42 may be executed, for example, a point-of-sale transaction, via a merchant's reader, or the transfer of funds, via an automated teller machine (ATM).***

93. As I discussed above for element [1.b], Fox discloses that its smartcard

RF interface is compatible with an external "RF card reader." *See* [1.b] (Section IX.A.2.c) above. Moreover, as discussed in [1.b], smartcard RF interface 40 coupled to antenna 26 act as an interface for a point of sale terminal in the form of an "RF card reader."

94. In my opinion, a person of ordinary skill in the art would have understood, or at minimum found it obvious, that Fox's "smartcard RF interface 40" and "antenna 26" are compatible with a hybrid smartcard reader because a hybrid smartcard reader is a versatile reader compatible to process transactions using different types of smartcard communications. For example, U.S. Patent No. 6,402,033 (issued June 11, 2002) discloses "the reader/writer can be a hybrid reader, i.e. it can read both magnetic cards and smart cards." Ex. 1021, 2:28-30. Additionally, U.S. Patent No. 6,138,916 (issued October 31, 2000) discloses "a hybrid reader that can read magstripe cards as well as smart cards." Ex. 1022, 4:43-44. Lastly, U.S. Patent App. Pub. 2005/0165784 (filed on May 24, 2004) discloses "[h]ybrid reader 240 includes a magnetic stripe reader 241 in communication with magnetic control and decode circuit 242 and smart card reader/writer 243 in communication with smart card control and decode circuit 244." Ex. 1023, [0050].

h. Claim 5

95. **Claim 5 recites "The apparatus of claim 1 further comprising memory accessible by the mobile phone."** This element is met by Fox.

96. See my discussion of the claims 1 and 3 above (Sections IX.A.2.a-d and f).

i. Claim 6

97. **Claim 6 recites "The apparatus of claim 1 further including software to be installed on the mobile phone."** This element is met by Fox.

98. See my discussion of the elements of claim 1 above (Sections IX.A.2.a-d). **Under the Patent Owner's interpretation, Fox discloses software** (*e.g.*, "program control") **to be installed on the mobile phone** (*e.g.*, "cellular telephone").[3] *E.g.*, Fox:

- **Fig. 4:**

[3] Patent Owner's infringement contentions in the Texas Case equate software to be installed on the mobile device and software preloaded on the mobile device—Patent Owner identifies a "software to be installed on the mobile phone" as "application software…preloaded…to the [mobile phone]," and points to software that is directly installed on the device, and not obtained from the alleged "apparatus." *See* Ex. 1014, Appx.E, 76-77.

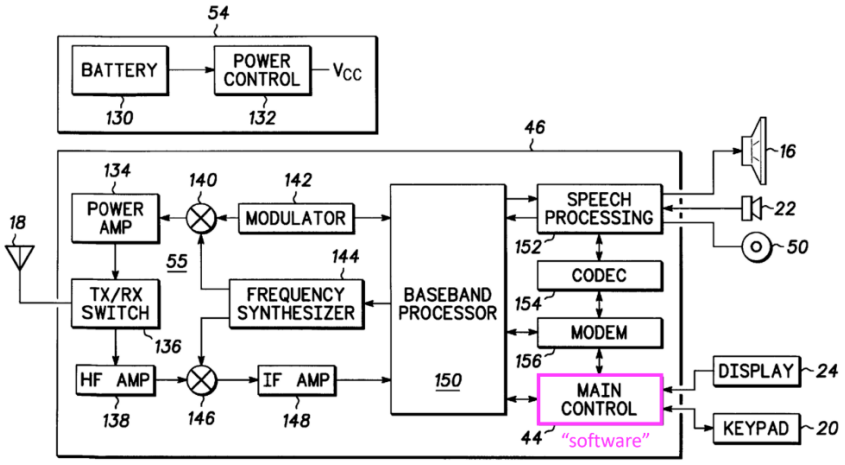


FIG. 4

- **Fig. 5:**

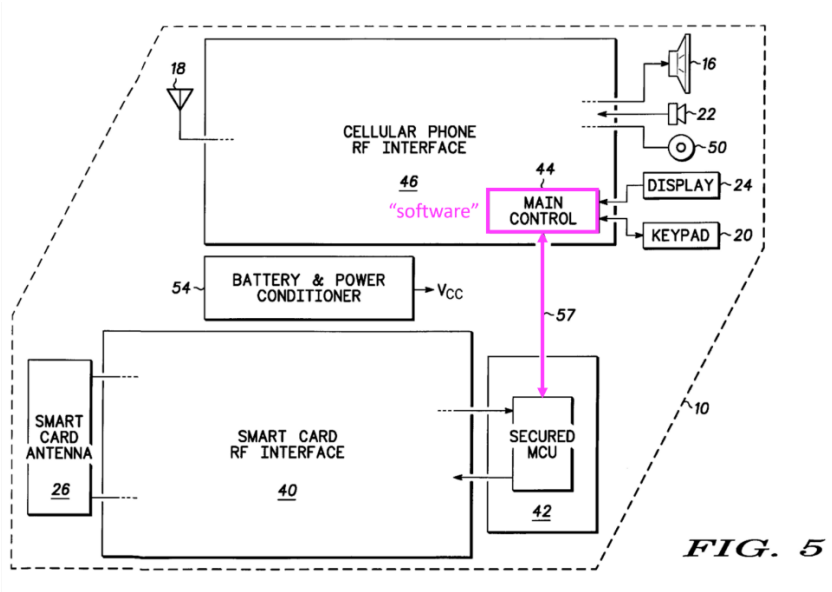


FIG. 5

- **Abstract:** A ***cellular telephone (10) incorporates the electronics*** for implementing both a cellular telephone function (46) and a ***smartcard function (45)***.

- **4:27-29:** Main controller 44 comprises an ***MPU for executing and performing under program control various cellular telephone functions***.

- **4:49-53:** Signal line 57, which couples main control 44 of cellular telephone circuitry 46 to smartcard circuitry 42, ***provides a means for MPU 41 to communicate with main control (MPU) 44 for performing***

both cellular telephone and smartcard functions. Alternately, the functions of main control 44 and MPU 41 of smartcard logic functions 42 may be combined into one single MPU.

99. See my discussion of element [1.pre] above (Section IX.A.2.a).

100. As discussed above for [1.pre], Fox discloses cellular telephone 10, which further includes "main controller 44," comprising "an MPU for executing and performing under program control various cellular telephone functions." Abstract, 4:27-29, Fig. 4. In my opinion, a person of ordinary skill in the art would have understood that the program control of cellular telephone 10 is software. *See, e.g.*, Microsoft Press Computer Dictionary (2nd ed., 1993) (which I understand has been identified as Ex. 1016, and would have been accessible to a person of ordinary skill in the art, e.g., through a library or a bookstore) at 365 (defining "Software" as "Computer programs; instructions that cause the hardware-the machines-to do work."). Thus, where Fox notes that the MPU executes under "program control," this would have been understood to be under software control. Fox, Abstract, 4:27-29.

B. GROUND 2: Fox in view of Takekawa (Claims 1-6)

101. To the extent further disclosure is required for "an apparatus" (all claims) and for "an apparatus including software to be installed on the mobile phone" (claim 6), Takekawa discloses an apparatus (*e.g.*, "IC card") including software to be installed on a mobile phone (*e.g.*, "application…installed to the information

processing terminal," such as "a portable telephone"). [0080], [0081].

102. Takekawa discloses a processing device, such as an integrated circuit ("IC") card, that is inserted into a phone, and has software that is installed on the phone. Takekawa, [0080]-[0081], [0083], Fig. 1. In my opinion, a person of ordinary skill in the art would have understood that "IC card" is interchangeable with "smartcard" and at minimum would have found it obvious to use a smartcard given its similar functionality to the extent it is argued that there is a difference between the two.[4] This software is used by the phone to initiate communication with the IC

[4] For example, the terms "integrated circuit card" and "smart card" are consistently used as alternatives for the same thing. *See, e.g.*, Ex. 1024, [0001] ("The invention relates to a new type of electronic IC (integrated circuit) card (also known as a smart card or chip card)…"); Ex. 1025, [0001] ("The present invention relates generally to electronic devices, and more particularly to an electronic integrated circuit card, i.e., smart card…"); Ex. 1026, [0001] ("The invention relates to Intelligent portable objects commonly known as smart cards or Integrated circuit (IC) cards."). Additionally, in a 2002 technical article published by the well-known Communications of the ACM Journal (that would have been accessible to a person of ordinary skill in the art, e.g., through a library or a bookstore) titled "Smart Card Evolution," Katherine M. Shelfer and J. Drew Procaccino discuss that IC cards are

Card. Takekawa, [0084].

103. Fox and Takekawa are analogous art, in the same field as the '219 patent, which includes electronic devices for performing transactions, and are reasonably pertinent to problems addressed by the named inventors of the '219 involving the use of electronic devices to securely perform transactions. '219 patent, 1:6-24, 4:61-5:8, 5:26-34, 6:3-21; Fox, 1:5-8, 2:10-29, 3:49-59, 4:43-56, Fig. 3; Takekawa, [0002], [0004], [0107]-[0110], Fig. 9.

104. In my opinion, a person of ordinary skill in the art would have been motivated to apply Takekawa's teaching of using a removable smartcard to Fox's smartcard device to advantageously allow a user to switch the smartcard device between devices. For example, a person of ordinary skill in the art would have understood that when a user purchases a new phone, the user may desire to switch their smartcard device from their old phone to a new phone so that the user can continue to access the information that is on their smartcard. For example, U.S. Patent App. Pub. 2007/0026893 (filed October 22, 2004) discloses that an "IC card may be…detachably connected with the mobile telephone terminal" such that, "even when a new mobile phone equipped with the NFC function is purchased, user

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frequently referred to as smartcards. Ex. 1019, 83 ("[T]he IC card, later dubbed the "smart card"").

information regarding the NFC function and user information stored in a mobile phone can be easily transferred and replaced." Ex. 1033, [0014], [0020].

105. In my opinion, a person of ordinary skill in the art would have found that using a removable smartcard in Fox's phone to be straightforward. Fox teaches that its smartcard 45 communicates with the main processor of the phone through a signal line. Fox, 4:49-53. A person of ordinary skill in the art would have been aware of detachable signal line connections, for example, in a SIM card slot typically found in phones, which was a well known mechanism for connecting smartcards to phones. For example, U.S. Patent App. Pub. 2007/0026893 (filed October 22, 2004) further discloses an IC card that is "integrated with a SIM card detachably connected with the mobile telephone terminal" Ex. 1033, [0014].

106. Moreover, in my opinion, a person of ordinary skill in the art would have been motivated to apply Takekawa's teaching of installing software on a phone with a removeable smartcard to Fox's mobile phone. For example, Takekawa discloses that software installed on the phone is used to allow communication between the phone's processor and the smartcard processor. Takekawa, [0084] (discloses that "terminal application program 31 which is loaded to the information processing terminal 30 is initiated so as to commence a communication with the card application program 11" on the IC card). A person of ordinary skill in the art would have been further motivated to apply Takekawa's teaching of installing software on

a phone with a removeable smartcard to Fox's mobile phone because software installation on a phone via smartcard insertion promotes the smartcard's ease of use, bolsters security, and facilitates accessibility for the user in contactless transactions. Takekawa, [0016], [0018], [0083], [0196]; Fox, 1:9-14, 2:21-29. For example, Takekawa's smartcard, when inserted into the phone, causes the phone "to execute a process operation and to realize secure processing functions of various services." [0083]. This allows software to be installed on the phone "in an easy manner, while the user need not perform the operation for acquiring the application program from the external source." [0196].

107. In my opinion, a person of ordinary skill in the art would have been further motivated to apply Takekawa's teachings of installing software on a phone with a removeable smartcard to advantageously simplify the process of installing the software on the phone. For example, a person of ordinary skill in the art would have recognized that installing software directly from a removable smartcard onto a phone would have avoided the need to separately obtain the software because it would come from the device as soon as it is inserted into the phone. Takekawa, [0016], [0018]. In the context of transmitting financial data (*see* Fox, 5:8-12), the smartcard device would advantageously provide the software needed to the phone without "acquiring an application program from an external source." Takekawa, [0016]. This avoids incorrect or improper installation by the user, a critical issue which leads

to limited operability and potential violations of license agreements. Takekawa, [0012], [0015]. This would also make it easier to provide the smartcard in a form that would be easily added by a user to an existing phone without the need to separately obtain the necessary software to allow the smartcard device to interoperate with the phone. Takekawa, [0016], [0018], [0044].

108. In my opinion, a person of ordinary skill in the art would have found that storing software on the smartcard device for installing the software on a phone to be straightforward. For example, a person of ordinary skill in the art would have recognized that smartcards are configured with sufficient storage capacity for storing application software, and their ability to store, retrieve, and transmit data makes them an optimal conduit to for installing software onto a mobile phone. *See, e.g.*, L. A Mohammed et al., Smart Card Technology: Past, Present, and Future (2004) (which I understand has been identified as Ex. 1027, and would have been accessible to a person of ordinary skill in the art, e.g., through a library or a bookstore), Abstract (describing smartcards as "secure portable storage devices used for several applications especially security related ones involving access to system's database either online or offline"); Uwe Hansmann et al., Smart Card Application Development Using Java (July 2002) (published by the well-known Springer Berlin, Heidelberg, which I understand has been identified as Ex. 1015, and would have been accessible to a person of ordinary skill in the art, e.g., through a library or a

bookstore), 18 (noting that smart cards "allow storing additional application code." Moreover, the process of installing software from an inserted device was well known. For example, U.S. Patent App. Pub. 2004/0214560 (filed May 18, 2004) discloses a "computer readable medium," such as a "removable storage medium" to "provide computer executable code (e.g., software and computer programs) to the computer system" as the "means for providing executable code, programming instructions, and software to the computer system." Ex. 1038, [0087].

109. Accordingly, a person of ordinary skill in the art would have had a reasonable expectation of success applying Takekawa's teachings to Fox's telecommunications device, and would have known such a combination (yielding the claimed limitations) would predictably work and provide the expected functionality.

X. SECONDARY CONSIDERATIONS

110. The Challenged Claims of the '219 patent are anticipated and rendered obvious by the grounds I discussed above. In my opinion, the strength of the obviousness grounds that I discuss above cannot be overcome by any alleged objective indicia.

111. There is no evidence in the '219 patent's prosecution history or elsewhere supporting any secondary considerations arguments, or evidence of any nexus to any particular claim of the '219 patent. *See generally* '219 File History. As

demonstrated by the prior art discussed above, any purported solutions to problems or unexpected results in the ’219 patent were already well known. *Id.*

112. To the extent that Patent Owner contends that the accused products in the pending district court case are infringing and thus demonstrate commercial success, such allegations would not provide any indication that the Claims are non-obvious. Such assertions would not demonstrate that Samsung’s products infringe, let alone show any nexus between any alleged commercial success and the Claims, or that any alleged success is due to an allegedly claimed component instead of the many unclaimed features of the accused products.

113. To the extent Patent Owner asserts the existence of any additional secondary considerations in its responses, or presents additional evidence or arguments, I reserve my right to address any such evidence.

XI. CONCLUSION

114. In summary, I have concluded that the Challenged Claims are anticipated by and rendered obvious over the prior art references as I discussed above. Specifically, in my opinion, for at least the reasons above, the Challenged Claims of the ’219 patent anticipated and obvious.

115. To the extent it is argued that any further disclosure is required for an element in the Challenged Claims that I have identified as being disclosed, a person of ordinary skill in the art would certainly have found that element obvious to include

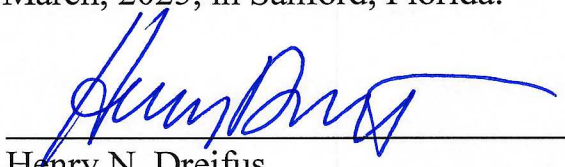
based on the sample explicit disclosure or inherent disclosures and analysis I have identified above.

116. I reserve the right to supplement my opinions in the future to respond to any arguments that Patent Owner or its expert(s) may raise and to take into account new information as it becomes available to me.

117. In signing this declaration, I recognize that the declaration will be filed as evidence in a contested case before the Patent Trial and Appeal Board of the United States Patent and Trademark Office. I also recognize that I may be subject to cross-examination in the case and that cross-examination will take place within the United States. If cross-examination is required of me, I will appear for cross-examination within the United States during the time allotted for cross-examination.

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

119. Executed this 10th day of March, 2025, in Sanford, Florida.



Henry N. Dreifus

APPENDIX A

HENRY N. DREIFUS

Chief Executive Officer
Dreifus Associates, Ltd., Inc.
1899 Lake Markham Preserve Trail
Sanford, Florida 32771
(407) 585 2840 telephone * (407) 256 8967 mobile
Henry.Dreifus@Dreifus.com

BACKGROUND

Founder and Managing Director of Dreifus Associates, Limited (DAL), an Identity technology and Personnel Assurance solutions development and integration organization. Accomplishments include holding a key patent on advanced smart cards and portable electronic transaction technology. Mr. Dreifus has more than 25 years of experience in the field including extensive experience on strategic engagements using all types of card technologies ranging from magnetic, optical and intelligent (smart card) for financial, security, consumer marketing and information applications. He is a recognized world expert in the card technology industry and provides vision for the application of enabling technologies to solve business problems. He is also a founding director of the Smart Card Industry Association and is a delegate to the International Standards Organization (ISO) and the American National Standards Institute (ANSI) developing worldwide standards for the smart card.

CURRENT BOARD POSITIONS

Wolverine Industries (formerly Wolverine Tube), Vice Chairman.

Institute for State Effectiveness (Non-profit).

Keel Digital.

Lucinity (Board Observer).

Preceptor Capital (Co-founder/Managing Partner).

Blokko (Advisory).

Bluerock Systems (Advisory).

FORMER BOARD POSITIONS

United States Department of Defense Business Board.

Domenici-Rivlin Debt Reduction Task Force, Senior Subject Matter Advisor.

Updated December 2024.

RDM Corporation (TSE: RC), sold to Deluxe Corporation (NYSE: DLX).

TelaDoc Corporation (NYSE: TDOC).

One Networks Corporation (d/b/a FINEXIO).

Viewzi Corporation.

Empire Financial Holding Corp. (AMEX: EFH).

Tranzfinity Corporation (Advisory).

Micromem Corporation (TSX, NASDAQ OTC: MMTIF).

Executives Without Borders (Advisory, Non-Profit).

Solution Design Group (Advisory).

Hypercom (Advisory) sold to Equinox.

AudeSi Technologies, sold to Wind River.

PROFESSIONAL EXPERIENCE

1991-Current

Founder/CEO of DAL, a specialty innovative consultancy and solutions integration company specializing in innovative low-cost solutions. Key clients include:

ZWIPE – Support development and design team for next generation integrated biometric enabled financial transaction card solutions for payment and ID access control applications. Scope includes development of intellectual property.

eBay / STUBHUB – Subject matter advisor supporting intellectual property and patent portfolio protection for e-commerce.

VALID SA – Supporting the leading Brazilian Electronic Identification and Security Solutions provider entry into the US market to a combined acquisitive and organic growth pathway. Drove the successful accretive acquisition of 9 US operating companies into the VALID SA portfolio, senior advisor – global strategy development.

VERAYO CORP – Supporting the development of next generation identification and security solutions based on uniquely identifiable features of semiconductors (Siometrics) and other advanced applications.

STATE OF INDIANA – Development of requirements, drafting and issuing/management for a statewide RFP for a debit/stored-value cashless electronic benefits distribution system for all state citizens. Program supports delivery of over $1 billion in benefits for unemployment, child support and other services.

SIEMENS AG – Leading the development team for accelerated product introduction of next generation capabilities for Infrastructure Logistics and Mobility business units. Work includes the product development, market identification and innovation including go-to-market execution of business and early-sale strategies with focus on US market introduction of global solutions.

OFFICE OF THE PRIME MINISTER, GOVERNMENT OF JAMAICA – Project executive leading best practices team of technical, data security, business processes improvement to architect and design a National Identification System to improve the identity assurance of all Jamaicans. The project includes assessments of key Identification processes including Passport, Civil Registries, Immigration/Naturalization and other stakeholders.

ORGANIZATION OF EASTERN CARRIBBEAN STATES (OECS) – Supporting the governments of the Commonwealth of Dominica, St. Lucia, St. Vincent and the Grenadines and Grenada for the needs assessment and design of a multi-application, multi-national citizen services card to include the delivery electronic government services, border crossing and other applications in support of the development of an Economic Union of the Island nations under a World Bank funded E-government/regional integration initiative.

MICROMEM CORPORATION – Lead strategic review of emerging nano-technology effort to perfect high-density magnetic memory and nano-senor arrays for large scale applications. Developed and refined market analysis pathways and initial channel partners. Our team is providing ongoing support the Board of Directors and the Technology committee in directing investment and initial product/market segmentation.

INTERNATIONAL POS MANUFACTURER – Developed next generation strategy and direction for the evolution of point-of-sale transaction card industry.

VISA USA/VISA INTERNATIONAL – Expert smart card witness in Department of Justice antitrust lawsuit. The team developed and provided smart card innovation and deployment expert testimony in the antitrust lawsuit in the United States.

DEPARTMENT OF VETERANS AFFAIRS – Lead team effort for the Secretary of the DVA to develop the VA into a Model Agency building a "Gold Standard" for data privacy and information protection after the May 2006 loss of a laptop containing all Veterans and Active-Duty Military personal information. Our team directly supported the Cabinet Secretary and the senior leadership team in building and implementing a best-practice sustainable outcome.

INTERNATIONAL BANK CARD COMPANY – Supported the market research and development and license distribution of an electronic purse system for selected markets. Defined market and commercial relationships and developed business agreements.

ETI S.A. – Reviewed national framework/strategy for the **Republic of Chile** for rollout of an enhanced smart card identification and access program for the country's banks and national telecom operator (CTC) for Chile.

SULTANATE OF OMAN – Provided third party independent review of the proposed smart card based national identification card being administered by the Royal Oman Police. Evaluated the proposed solutions and provided guidance/recommendations for implementation.

VIISAGE TECHNOLOGIES, INC. – Supported development of overall ID protection strategy and business enabling. Evaluated and developed market-enabling scenarios.

FUJI PHOTO FILM CORPORATION – Developed baseline strategy for entry into the ID management.

THESEUS LOGIC – Developed market entry strategy for next generation "clockless" microprocessors and security logic for smart card and advanced credentials for the identification markets.

INTERNATIONAL TRANSACTION CARD COMPANY – Developed market strategy for next step card technology platform and business approach for multi-function/multi-application card programs.

UNITED STATES DEPARTMENT OF DEFENSE – Numerous Projects including:

- Project advisor for Study Committee, United States Department of Defense, Office of the Secretary of Defense for advanced identification cards and technologies (AIT).
- Project manager for development of US Navy smart card baseline study for deployment of smart cards for multiple applications in the US DoD.
- Office of Secretary of Defense Advisor to Senior Steering Group (SSG) for policy and planning (including appropriations, budgeting, cost/evaluation) for DOD implementation of smart cards.
- Defense Manpower Data Center (DMDC) project manager to evaluate implementation strategies for smart card issuance and life-cycle management for smart cards for uniform, civilian and contractor personnel.
- Department of Defense – principal architect for the Common Access Card (CAC).
- US Navy Chief Information Officer (CIO) planning and strategy development for enabling smart card for use as secure token for public key infrastructure (PKI).
- Strategy and development of new next generation social media tools and technologies for non-kinetic constructive engagement.

WESTERN GOVERNORS' ASSOCATION (WGA) HEALTH PASSPORT PROJECT – Developed smart card-based health passport multi-application system for management of health and entitlement benefits for Wyoming, Nevada and Montana. System supports immunization, WIC, Food Stamp, head start and other programs.

INTERNATIONAL CREDIT CARD ASSOCIATION – Project support to establish business economics, technical pathways and strategy to introduce chip-based credit cards to member-owned association of banks and financial institutions. Developed, reviewed and supported technical and business requirements for introduction of chip cards for credit card and other value-added applications for world markets for board-level go/no-go decision.

NAVIGY – Performed independent market research study to evaluate the feasibility of new transactional methods for the health insurance/claims processing industry. Navigy is a joint-venture development arm of the Blue Cross federated state associations.

EASTMAN KODAK COMPANY – Explored business strategy/development of access security identification technology and integration into card authentication products.

INTERNATIONAL SECURITY ACCESS CARD AND SYSTEM MANUFACTURER – Developed business model and strategy/roadmap for access card technology including outsourcing options. Planning and implementation of road map for next-generation access card technology for tiered site security/access control applications including multi-application card services.

MULTINATIONAL CHIP CARD IC MANUFACTURER – Developed market research and demand estimates by industry for USA smart card requirements. Constructed card adoption models based on industry triggers by market segment. Provided detailed market potential estimates by major markets.

RAND MCNALLY CORPORATION – Developed market research and strategy for building next-generation products for DocuSystems Group, the media supplier for the airline and transportation industries. Team provided project resource planning and management oversight to new generation product line.

NATIONAL BANKING GROUP & NATIONAL TELEPHONE COMPANY – (Numerous projects) Developed national electronic commerce platform and implementation strategy for supporting electronic transactions based on smart card technology. Developed scenarios and planning to integrate existing card platforms into the national platform road map.

NORTHERN TELECOM, LTD. – (Numerous assignments) Ongoing project efforts for entry into advanced card-enabled business including next-generation public telephones (payphones), Internet opportunities, competitive analysis and market research.

NATIONAL GOVERNMENT INTER-BANKING ORGANIZATION – Advisor to executive management of the seven primary banks and monetary authority to study the feasibility and implementation of a multi-services common stored value/benefit card country-wide. Project involved the review of alternative technologies and systems, with particular attention to fraud and security procedures. System design and pilot development for pre-payment cards to be used and accepted as electronic money throughout the country.

MEDICAL SOFTWARE COMPANY – Project advisor for development of a card based electronic medical record for long-term management and tracking for patients. Pilot project involved heart transplant patients and individuals who receive medical implants (pacemakers, heart valves, artificial limbs, and other critical medical devices). Scope of project included development of the card strategy, technology selection and supplier selection.

INTERNATIONAL BANK CARD TRANSACTION PROCESSING COMPANY – Strategy and market development consultants to develop additional market share and next-generation products. Scope covers the SVC “chip-card” electronic purse application along with enhanced electronic money services.

MAJOR TELEPHONE OPERATING COMPANY – Supported the development of the market and business case for advanced card project. Built the business model and provided competitive and strategy support for venture.

DUTCH POST, TELEPHONE, & TELEGRAPH (PTT Post) – Business advisor to senior leadership team to privatize a major European PTT. Provided support in development and implementation of the strategic, competitive and tactical utilization of key assets including subscriber services. Project also focused the Postal other non-telecommunications uses and services of the capabilities and infrastructure.

MAJOR TELECOMMUNICATIONS EQUIPMENT MANUFACTURER – (Numerous projects) Project director to develop and install a credit card and smart card-based pay telephone including the infrastructure systems software, management and control procedures and security procedures. System design included the development of central office management and monitoring equipment, processes and procedures. The team explored development and market feasibility assessment of web-based access products (versus dial-tone based products).

MAJOR CARD MANUFACTURER – Advisor to the senior management on the strategy and pathways to develop new card-based products. The team is currently providing ongoing market assessment and market research on developing markets and applications.

EQUIPMENT MANUFACTURER – Project leader to develop a new set of products for the development and manufacturing of embedded smart card-based equipment for the professional, consumer and retail markets.

INTERNATIONAL CARD ASSOCIATION – Market readiness assessment of infrastructure to deploy and convert to smart cards from magnetic stripe cards. Studied feasibility and industry readiness and steps required to convert to smart card-based transactions.

MAJOR MULTINATIONAL FINANCIAL INSTITUTION – Card technology advisor for the development of an off-line secure corporate-treasury authorization system using advanced electronic cards. The project team determined alternative scenarios, economics and technology selection.

SIEMENS AG, INFINEON TECHNOLOGIES – Project director for market research and development of next-generation IC technology for chip cards. Project developed market research and forecasting for current and future generation applications. Developed focus group reviews for assessing product features, costs, capabilities and application requirements. Markets included set top box/conditional access, identification and security, telecommunications, banking, healthcare and government/defense.

OKI ELECTRIC COMPANY, LIMITED – Project advisor developing entry scenarios for portable electronic transaction systems. Development included work on electronic wallet and other hand-held portable delivery systems for electronic purse cards and other applications.

REMOTE MEMORY TELEPHONE CARD PROVIDER – Project consultant to establish and review business case for remote 1-800 memory telephone long-distance calling services. Developed and reviewed business case economics, systems, tariff and legal aspects as well as formulated growth and alliance plans.

COMMONWEALTH SECURITIES, INC. – Due diligence and market research to establish market potential and forecasts for pre-payment card utilization for Americas (North, Central and South) and Europe (East and West).

1988-1991

As the manager of the worldwide card technology practice for Andersen Consulting (now Accenture), Mr. Dreifus established and directed the worldwide Advanced Card Systems consultancy, developed a partnership-wide training program for designing and building systems based on advanced card technologies. Practice covered all card technologies from magnetic stripe, optical memory card, integrated circuit (smart) through radio frequency identification (RFID) cards.

Projects and clients included:

STATE OF WYOMING EBT FEASIBILITY STUDY – Project director for a study to explore the feasibility of using electronic benefit transfer (EBT) technology in the following programs:

- Aid for Dependent Children (AFDC)
- Women, Infants and Children (WIC)
- Food Stamps
- Medicaid Eligibility (Title XIX)

The project objective determined the viability of combining all programs onto a single information card.

MAJOR OVERSEAS BANK – Technical manager for the development of an off-line multi-services banking product to be launched Q4 '91.

MAJOR FINANCIAL INSTITUTION – Advisory manager for the development of an innovative smart card based commercial payment system.

ASIA/PACIFIC NATIONAL GOVERNMENT – Advisory manager to cabinet committee for the evaluation of alternative distribution methods for social welfare, health and other services through advanced technologies.

EUROPEAN GOVERNMENT DEPARTMENT OF SOCIAL SECURITY – Acted as quality assurance reviewer for the study of using Smart Cards to distribute social security benefits. Existing benefit payment systems were reviewed, and the feasibility of alternative distribution methods was examined.

DUTCH POST, TELEPHONE, & TELEGRAPH (PTT Post) – Participated with in development of courses of action and alternatives for the consideration of privatization of the PTT. Additionally, advised PTT management on the cost, benefits and opportunities for introducing smart cards (pre and post payment). Project work included definition of projects to design and implement country-wide smart card-based systems. Lead manager for this project.

STATE OF TENNESSEE – Advised the Department of Corrections on the feasibility and options for electronic tracking of inmates at correctional institutions. The project team explored the use of non-contact radio frequency identification tags for inmates and employees.

MIDLAND BANK (U.K.) – Technical advisor to the project team developing long-range information technology strategies post-1992. Project work included the review of banking automation products from ATMs through smart cards.

1992 SUMMER OLYMPIC GAMES/BANCO ESPANOL DE CREDITO – Developed overall strategy and feasibility for introducing and using a multi-service smart card at the 1992 Olympics for use by members of the Olympic family to include ticketing, cashless payment and security.

MAJOR LOCK MANUFACTURER – Conducted project development, planning and review for smart card based electronic stand-alone lock and related equipment. Led the evaluation of candidate market segment

requirements, smart card technology alternatives and system/product characteristics.

MAJOR RETAIL ENERGY COMPANY – Technical advisor for the development of future in-store retail automation systems.

MAJOR TELECOMMUNICATIONS COMPANY – Advised in the strategy for product development and distribution of smart card-based services. Study included the review of existing and new markets for smart card applications.

MULTINATIONAL FINANCIAL INSTITUTION – Advisory manager for the development of a cross-border banking system for high-net-worth individuals as they travel around the world.

1983-1988

Independent consultant and principal of a research and development company in smart cards and related transaction technology. Major projects included:

CITICORP – Responsible for assisting the bank in designing and planning corporate business strategies for various divisions.

- Developed strategic and tactical plans for the voice and data networks, contingency/recovery planning and network security for the North American Finance Group,

- Provided review and evaluation for business and technical requirements for the design and implementation of an expert system to automate the worldwide individual bank.

COMMITTEES AND SOCIETIES

Smart Card Industry Association **–** Founding director and member of the executive committee.

Health Care Work Group **–** Participating member in the Smart Card Forum's task force developing the national position on smart cards for health care services.

Smart Card Applications and Technologies (SCAT) Program Committee member, 1986-1990.

ANSI X3.B10 WG1 Integrated Circuit (Smart) Card standards committee. Committee Secretary 1986.

ANSI X3.B10 participating member for card related standards.

ANSI X9.A6 participating technical expert for the review of financial standards for integrated circuit (smart) cards.

ISO Technical Advisor to TC 97/SC 17 for development of international interchange standards for integrated circuit (smart) cards.

EDUCATION

Master of Business Administration, Washington University, St. Louis.
Beta Gamma Sigma honor society.

Bachelor of Science in Computer Science and Engineering, Moore School of Engineering, University of Pennsylvania. Member of the Moore School Student Council and ACM chapter chairman.

U.S. PATENT

Portable Electronic Transaction Device and System Therefor, an integrated smart card-based computer system. U.S. Patent # 4,575,621.

PUBLICATIONS & PRESENTATIONS

Mr. Dreifus has authored and presented numerous papers on the utilization of advanced technologies around the world. He coauthored the book *Smart Cards: A Guide to Building and Managing Smart Card Applications*, published by John Wiley & Sons. He is a noted speaker on several topics:

- Application of advanced card technologies
- Public telecommunications
- Electronic benefits transfer (EBT)
- Cyber and Data security
- Large scale identification

In addition, Mr. Dreifus has presented expert testimony to the U.S. Congress including assisting in developing the first landmark Federal anti-computer crime legislation, the Computer Fraud and Abuse Act.

Summary of Henry N. Dreifus Expert Witness Client Support

Type of Matter:	**Payment Patent Infringement**
Law Firm:	Ropes & Gray
Case Name:	iCashe vs. **Samsung**
Services Provided:	Research, analysis and evaluation of patent invalidity for mobile payment using magnetic stripe emulation and RF, research, analysis
Disposition:	Ongoing
Date:	2025

Type of Matter:	**E-Purse Funding and Payment Patent Infringement**
Law Firm:	Joint Defense: DLA Piper LLP, Ropes & Gray, et. al.
Case Name:	RFCyber vs. **Walmart,** Volkswagen, Shell Oil Products (Equilon Enterprises), Starbucks, Costco, Kroger, Electrify America
Services Provided:	Research, analysis
Disposition:	Pending (joint defense consolidation)
Date:	2024

Type of Matter:	**Payment Tokenization Patent Infringement**
Law Firm:	Wilson Sonsini Goodrich & Rosati
Case Name:	Cortex MCP, Inc. vs. **VISA**
Services Provided:	Research, analysis and evaluation of payment using tokens/tokenization, claim construction expert reports.
Disposition:	Case stayed due to IPR
Date:	2024

Type of Matter:	**Trade Secret Misappropriation**
Law Firm:	Quinn Emanual
Case Name:	Mad Mobile Inc. vs. **Meijer Stores**
Services Provided:	Research, analysis and evaluation of retail POS transaction payment processing modernization and business framework, expert declarations, rebuttal, deposition, arbitration testimony.
Disposition:	Favorably settled for the client.
Date:	2023 – 2024

Type of Matter:	**Patent Infringement and Validity for Self-Service Payment Vending**
Law Firm:	Wilson Sonsini Goodrich & Rosati
Case Name:	**Payrange** vs. CSC
Services Provided:	Research, analysis and evaluation of patents and evaluation analysis of infringement by CSC's POS transaction system hardware and software.
Disposition:	Favorably settled for client.
Date:	2024

Type of Matter:	**Payment Cards retail processing transactions framework dispute**
Law Firm:	Jones Day
Case Name:	4699 Investment Corporation vs. **Marathon Petroleum Corporation, LP**
Services Provided:	Research, analysis and evaluation of retail POS transaction payment processing system and business framework, expert report.
Disposition:	Favorably settled for client
Date:	2023

Type of Matter:	**Patent Validity and Infringement regarding NFC contactless and Secure Electronic Transactions**
Law Firm:	Ropes & Gray
Case Name:	Aire Technology vs. **Apple Computer Corp.**
Services Provided:	Analysis of prior invalidating art, non-infringement
Disposition:	Favorably settled for client
Date:	2022

Type of Matter:	**Patent Validity and Infringement regarding Mobile Wallet Application**
Law Firm:	DLA Piper, LLP
Case Name:	Fintiv vs. **Apple Computer Corp.**
Services Provided:	Research and analysis of prior invalidating art, non-infringement, and preparation, drafting and submission of expert reports, technological comparability rebuttal, depositions.
Disposition:	Summary Judgement in favor of client
Date:	2020

Type of Matter:	**Trade Secret Misappropriation**
Law Firm:	Kutack Rock, LLP
Case Name:	**Chase Global Services** vs. Protech Solutions
Services Provided:	Analysis of trade secret misappropriation / preparation and submission of expert report, deposition.
Disposition:	Case stayed due to the pandemic
Date:	2020

Type of Matter:	**Patent Validity and Infringement regarding multi-function card**
Law Firm:	Fish & Richardson
Case Name:	Alexsam vs. **CIGNA et. al.**
Services Provided:	Analysis of prior invalidating art, non-infringement and preparation / submission of expert report, deposition.
Disposition:	Summary Judgement in favor of client
Date:	2020-2021

Type of Matter:	**Smart Card Personalization**
Law Firm:	Stinson LLP
Case Name:	Entrust Datacard vs. **Zeiser GmbH, et. al.**
Services Provided:	Analysis of prior invalidating art and preparation / submission of expert report, deposition.
Disposition:	Settled in favor of client
Date:	2019

Type of Matter:	**Co-Branded Credit Card implementation**
Law Firm:	Williams, Porter, Day & Neville, P.C.
Case Name:	**BLACK CARD** vs. Visa USA
Services Provided:	Review and analysis of payment specifications and standards for issuing and operating a co-branded credit card for affluent cardholders. conformance of product to payment card industry specification and requirements. Provided research, analysis and expert report.
Disposition:	Adjudged
Date:	2017

Type of Matter:	**Patent Validity regarding Electronic Passports and Travel Documents**
Law Firms:	Stephen Norman Weiss and Fleit Gibbons Gutman Bongini & Bianco PL
Case Name:	United States Department of Justice v. **Iris Corporation Behrad**
Services Provided:	Research, analysis, submission of an expert report, deposition.
Disposition:	IPR challenge terminated in favor of client
Date:	2016

Type of Matter:	**Evaluation and Analysis of Payment Card Solutions for Financial Services**
Law Firm:	Snell & Wilmer
Case Name:	FiTeq vs. **Venture Corporation**
Services Provided:	Review and analysis of conformance of product to payment card industry specification and requirements. Provided expert reports, deposition, court testimony.
Disposition:	Adjudged favorably for the client
Date:	2014-2017

Type of Matter:	**Patent Infringement and Validity of Advanced Security Features of Driver Licenses**
Law Firm:	Morgan, Lewis & Bockius
Case Name:	**MorphoTrust** v. CBN Secure Technologies
Services Provided:	Research, analysis of rebuttal positions for patent validity, submission of expert report.
Disposition:	Settled in favor of client
Date:	2016

Type of Matter:	**Patent Validity and Infringement regarding Electronic Wireless Payment**
Law Firm:	Paul Hastings
Case Name:	**eBay** v. Purple Leaf Holdings
Services Provided:	Search and analysis of prior invalidating art, preparation / submission of expert report in support of a Petition before the PTAB for review.
Disposition:	PTAB Decision to institute; favorably settled for client
Date:	2014-2016

Type of Matter:	**Patent Validity and Infringement regarding Near Field Communications (NFC) Smart Cards**
Law Firm:	Ropes & Gray
Case Name:	**NXP** (now Qualcomm) vs. France Brevets, et. al.
Services Provided:	Research and Technical Analysis including Patent validity, client strategy, prior art research, patent invalidity analysis
Disposition:	Declaratory Judgement in favor of client
Date:	2015

Type of Matter:	**Patent Validity regarding Universal Credit Card Apparatus**
Law Firm:	Finnegan Henderson
Case Name:	**Square** v. e-Charge Licensing LLC
Services Provided:	Analysis of prior art and preparation / submission of expert report, deposition.
Disposition:	PTAB Decision to institute, ruled all patents invalid in favor of client
Date:	2014-2015

Type of Matter:	**Patent infringement and validity regarding Secure Data Transfer for Electronic Transactions**
Law Firm:	Hunton & Williams, et. al.
Case Name:	Maxim Integrated Products v. **Capital One Financial Corporation, et. al.**
Services Provided:	Research and Technical Analysis including Patent validity, client strategy
Disposition:	Settled in favor of client
Date:	2012-2015

Type of Matter:	**Patent Infringement and Validity regarding Prepaid Card Solutions**
Law Firms:	Alston & Bird, Paul Hastings
Case Name:	**e2Interactive, Inc. et al** v. Blackhawk Network, Inc.
Services Provided:	Research and technical analysis on patent validity and patent comparability analysis declaration and expert report, deposition and court testimony on patent technological comparability.
Disposition:	Jury verdict including damages awarded in favor of client
Date:	2011-2012

Type of Matter:	**Product Infringement of Point-of-Sale Wireless Solution and Software**
Law Firm:	Nixon Peabody, LLP
Case Name:	Communication Transaction Solutions, Inc. v. **VeriFone Holdings, Inc.**
Services Provided:	Research and technical analysis, expert declaration, deposition.
Disposition:	Settled
Date:	2007-2008

Type of Matter:	**Patent Infringement regarding Prepaid Phone Cards**
Law Firm:	Sidley Austin LLP
Case Name:	TGIP Inc. v. **AT&T Corporation, et al**
Services Provided:	Research and technical analysis, patent validity/infringement research, client strategy
Disposition:	Adjudged/Judgment as a Matter of Law (JMOL) in favor of client
Date:	2006-2007

Type of Matter:	**Trade Secret Misappropriation/Patent infringement of Biometric Smart Cards**
Law Firm:	Stoel Rives LLP
Case Name:	E-Smart Technologies, Inc., IVI Smart Technologies, Inc. v. **Wayne Drizin, Michael Gardiner, Electronic Plastics Corporation, A Card Company**
Services Provided:	Research and technical analysis, expert report preparation, client strategy
Disposition:	Settlement discussions/stayed
Date:	2006-2008

Type of Matter:	Sherman **Antitrust Act**
Law Firm:	Heller-Ehrman
Case Name:	United States v. **Visa USA,** Visa International and MasterCard International
Services Provided:	Expert analysis for Visa on Payment Systems Innovation and Smart Cards, prepared expert report, deposition
Disposition:	Adjudged
Date:	1999-2001

APPENDIX B

APPENDIX B (LIST OF MATERIALS CONSIDERED)

Exhibit No.	DESCRIPTION
1001	U.S. Patent No. 8,403,219 ("'219")
1002	File History of U.S. Application No. 13/651,365 ("'219FH")
1009	U.S. Patent No. 5,943,624 ("Fox")
1014	Plaintiff iCashe's Infringement Contentions, Including Exhibit E
1015	Uwe Hansmann et al., Smart Card Application Development Using Java (July 2002)
1016	Software, Microsoft Press Computer Dictionary (2nd ed., 1993)
1019	Katherine M. Shelfer and J. Drew Procaccino, Smart Card Evolution (July 2002)
1020	U.S. Patent App. Pub. No. 2005/0015275 ("Takekawa")
1021	U.S. Patent No. 6,402,033 ("Ohrn")
1022	U.S. Patent No. 6,138,916 ("Zolkos")
1023	U.S. Patent App. Pub. 2005/0165784 ("Gomez")
1024	U.S. Patent App. Pub. 2004/0146066 ("Palmade")
1025	U.S. Patent App. Pub. 2003/0168515 ("Gray")
1026	U.S. Patent App. Pub. 2006/0056216 ("Rhelimi")
1027	L. A Mohammed et al., Smart Card Technology: Past, Present, and Future (2004) ("Mohammed")
1033	U.S. Patent App. Pub. 2007/0026893 ("Sakamoto")
1034	Finkenzeller, K., RFID Handbook, First Edition ("Finkenzeller-RFID")
1038	U.S. Patent App. Pub. 2004/0214560 ("Date")
1039	U.S. Patent No. 6,012,634 ("Brogan")

1040	Serway Jewett, Physics for Scientists and Engineers (6th ed., 2004)

* I also considered any additional materials referenced in my declaration.