

UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE PATENT TRIAL AND APPEAL BOARD

APPLE INC.,

Petitioner,

v.

TELCOM VENTURES LLC,

Patent Owner.

Case No. IPR2025-01233

U.S Patent No. 9,832,708

DECLARATION OF CHUCK EASTTOM

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Table of Exhibits

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2001	Interim Processes for PTAB Workload Management, Acting Director Memorandum (March 26, 2025) (https://www.uspto.gov/sites/default/files/documents/InterimProcesses-PTABWorkloadMgmt-20250326.pdf)
2002	Order Granting Joint Stipulation to Dismiss With Prejudice Counts I, II, V, and VIII of Telcom Ventures’ Complaint
2003	Third Amended Docket Control Order
2004	Standing Order for Civil Cases Before Judge Rita F. Lin
2005	Telcom Ventures’ Proposed Case Schedule for the Apple Litigation
2007	<i>Curriculum Vitae</i> of Dr. Chuck Easttom
2008	Chiradeep BasuMallick, “What is NFC (Near Field Communication)? Definition, Working, and Examples” (Sept. 29, 2022), https://www.spiceworks.com/tech/networking/articles/what-is-near-field-communication/
2009	Liu et al., “Near-Field Communications: A Comprehensive Survey,” IEEE (June 2025)
2010	“The Creation of the NFC Forum and its Vision” (2011) https://cs.stanford.edu/people/eroberts/courses/cs181/projects/2010-11/NFCChips/nfcforum.html
2011	McHugh & Yarmey, “Near Field Communication: Introduction and Implication,” ERIC (2012)
2012	Coskun et al., “The Survey on Near Field Communication,” Sensors (June 5, 2015)

I. INTRODUCTION

1. My name is Dr. Chuck Easttom, and I have been retained as a technical expert by counsel for Patent Owner Telcom Ventures LLC (“Telcom Ventures” or “Patent Owner”) to investigate and opine as to the validity of U.S. Patent No. 9,832,708 (the “’708 patent”) in view of the Petition for *Inter Partes* Review (the “Petition”, Paper 1) by Petitioner Apple Inc. (“Petitioner” or “Apple”).

2. This declaration is based on information currently available to me. To the extent that additional information becomes available, I reserve the right to continue my investigation and study and thus may expand or modify my opinions as my investigation and study continues. I may also supplement my opinions in response to any additional information that becomes available to me, any matters raised by Petitioner and/or opinions rendered by Petitioner’s experts, or in light of any relevant orders from the Board.

3. My opinions are based on my years of education, research, and experience, as well as my investigation and study of relevant materials.

4. I am being compensated at the rate of \$550 per hour for my work in this case, including time spent testifying. I am also being reimbursed for reasonable fees and expenses, including hotel and travel expenses, incurred as a result of my work in this case. Neither I nor my company have received any additional compensation for my work in this *inter partes* review. My compensation is not tied in any way to

the substance of my testimony or the outcome of this proceeding. I have no other financial interest in this inter partes review or to the parties. I am available to offer these opinions at deposition and at trial if called upon to do so.

II. QUALIFICATIONS

5. I have summarized in this section my educational background, work experience, and other relevant qualifications. A true and correct copy of my curriculum vitae is attached as Ex. 2007 to Patent Owner's Preliminary Response, which includes a list of all other cases in which, during the previous four years, I have testified at trial or by deposition.

6. I have over thirty years of experience in the computer science industry including extensive experience with computer security, mobile devices, and related topics. I have authored forty-five computer science books, including books on mobile devices and on cryptography. I also have authored over eighty research papers and am an inventor with twenty-seven computer science patents.

7. I hold a Doctor of Science (D.Sc.) degree in Cyber Security from Capitol Technology University (Dissertation Topic: "A Comparative Study of Lattice Based Algorithms for Post Quantum Computing"). I also hold a Doctor of Philosophy (Ph.D.) in Technology focused on nanotechnology (Dissertation Topic: "The Effects of Complexity on Carbon Nanotube Failures") from Capitol Technology University. I also have a Doctor of Philosophy (Ph.D.) in Computer

Science from the University of Portsmouth (Dissertation Topic: “A Systematic Framework for Network Forensics Using Graph Theory”). I also hold four Master’s degrees—one in Applied Computer Science, one in Education, one in Defense and Strategic Studies, and one in Systems Engineering.

8. I am currently an Adjunct Lecturer for Georgetown University teaching graduate courses in requirements engineering, artificial intelligence, cybersecurity, and cryptography. I am also an adjunct for Vanderbilt University teaching graduate computer science courses in quantum computing, digital forensics, algorithms, and cybersecurity. I also developed a graduate course in digital forensics for the University of Dallas and taught that course from 2019 to 2022.

9. I am a Senior Member and Distinguished Speaker for the Association of Computing Machinery (“ACM”) and a Senior Member and Distinguished Visitor of the Institute for Electrical and Electronics Engineering (“IEEE”). The IEEE is the world’s largest and most preeminent engineering organization. Among other activities, the IEEE creates industry standards for a wide range of engineering disciplines, including software development. I am also a Distinguished Visitor of the IEEE. I have been involved in IEEE standards creation for several years.

10. I have extensive experience with smart cards, Near Field Communications (“NFC”), the ISO/IEC 7810 standard for identification cards, the ISO/IEC 7816 standard for electronic cards for identification, the ISO/IEC 14443

standard for contactless integrated circuit cards, the EMV standard, and related standards and technologies.

11. I have worked with smart cards as an authentication method since the Department of Defense began using the Common Access Card in the early 2000s. Near Field Communications were covered in networking courses that I took as part of my second Master's degree and in some of the networking certifications I hold. I have also worked with NFC since at least 2005. Specific certifications I hold that are relevant to NFC and/or mobile devices include:

- Associate of Systems Engineering (ASEP) from INCOSE (International Council on Systems Engineering) 275062
- CompTIA Network + Certified COMP10163630
- CompTIA Network Infrastructure Professional – CNIP COMP10163630
- EC Council Certified Security Administrator (ECSA) ECC947248
- EC Council Certified Encryption Specialist (ECES)
- CISSP – ISSAP – Certified Information Systems Architecture Professional #387731
- CISSP – ISSEP Information Systems Security Engineering Professional #387731
- Oxygen Phone Forensics Certified
- CompTIA Security+ COMP001021522764
- SC-300 - Microsoft Identity and Access Administrator

12. Specific publications that I have authored or participated in related to NFC, chip design, and/or mobile devices include the following:

- Easttom, C. (2005). Introduction to Computer Security. New York City, New York: Pearson Press.
- Easttom, C. & Dulaney, E. (2015). CompTIA Security+ Study Guide: SY0-401. Hoboken, New Jersey: Sybex Press.
- Easttom, C. & Roberts, R. (2018). Networking Fundamentals, 3rd Edition. Goodheart-Wilcox Publishing.
- Easttom, C. (2020). Modern Cryptography: Applied Mathematics for Encryption and Information Security 2nd Edition. New York City, New York: Springer Press.
- Easttom, C. (2021). An In-Depth Guide to Mobile Device Forensics. CRC Press.
- Easttom, C., Mei, N. (2019). Mitigating Implanted Medical Device Cybersecurity Risks. IEEE 10th Annual Computing and Communication Conference UEMCON.
- Easttom, C., Sanders, W. (2019). On the Efficacy of Using Android Debugging Bridge for Android Device Forensics. IEEE 10th Annual Computing and Communication Conference UEMCON.

13. I am qualified to render the opinions set forth herein. Under my definition of a POSITA, or Mr. Lipoff's definition, set forth below, I am and was as of the priority date of the '708 Patent, at least one of ordinary skill in the art.

III. MATERIALS CONSIDERED

14. I have reviewed the '708 Patent, including the challenged claims, prosecution history, and relevant patent family. The '708 Patent was marked as Exhibit 1001, and its prosecution history was marked as Exhibit 1002.

15. I also reviewed the Petition, and each of Exhibits 1001-1041 attached to the Petition. I also reviewed Apple's Exhibit 1042 that was attached to Petitioner's Updated Exhibit List.

16. In forming my opinions, I have considered the materials listed above and any other documents cited in this declaration. I have also relied on my own education, knowledge, and experience in the relevant art.

17. I have also considered the understanding of a person of ordinary skill around the time of the invention of the '708 Patent.

IV. SCOPE OF OPINIONS

18. I set forth my opinions throughout this declaration.

19. I understand that Petitioner argues that:

Ground	Claims	Proposed Ground of Unpatentability
1	1-3, 5-8, 10-13, and 15-19	Obvious under pre-AIA 35 U.S.C. § 103 over Carlson ¹ in view of ISO-14443 ²
2	9	Obvious under pre-AIA 35 U.S.C. § 103 over Carlson in view of ISO-14443 and Jazayeri ³

¹ U.S. Patent No. 8,229,852 ("Carlson," Ex. 1005).

² ISO/IEC 14443 ("ISO-14443," Ex. 1016).

³ U.S. Patent Application Publication No. 2008/0155268 ("Jazayeri," Ex. 1007).

Ground	Claims	Proposed Ground of Unpatentability
3	4 and 14	Obvious under pre-AIA 35 U.S.C. § 103 over Carlson in view of ISO-14443 and Birch ⁴

20. All three grounds rely on a combination of Carlson in view of ISO-14443. Mr. Lipoff also suggests that a person of ordinary skill would have been motivated to combine Carlson with either Jazayeri or Birch to meet the language of certain dependent claims.

21. I disagree. It is my opinion that the Challenged Claims of the '708 Patent would not have been obvious in view of the asserted references, alone or in combination, for the reasons discussed herein.

V. RELATED MATTERS

22. Patent Owner asserted the '708 Patent against Petitioner in the Northern District of California, styled *Telcom Ventures LLC v. Apple Inc.*, Case No. 5:25-cv-05041 (filed October 4, 2024).

23. I understand that Patent Owner asserted a total of eight patents against Petitioner in that action: U.S. Patent Nos. 9,462,411, 9,832,708, 10,219,199, 10,674,432, 11,770,756, 11,924,743, 11,937,172, and 12,028,793. I understand that Patent Owner has dismissed four of the asserted patents from the litigation, including the '708 Patent.

⁴ U.S. Patent No. 7,213,742 ("Birch," Ex. 1031).

24. I understand that Petitioner filed IPR petitions against all eight patents originally asserted by Patent Owner. These are:

- IPR2025-01232, regarding U.S. Patent No. 9,462,411
- IPR2025-01233, regarding U.S. Patent No. 9,832,708
- IPR2025-01233, regarding U.S. Patent No. 9,832,708
- IPR2025-01235, regarding U.S. Patent No. 10,674,708 (the Petition)
- IPR2025-01236, regarding U.S. Patent No. 11,770,756
- IPR2025-01237, regarding U.S. Patent No. 11,924,743
- IPR2025-01238, regarding U.S. Patent No. 11,937,172
- IPR2025-01239, regarding U.S. Patent No. 12,028,793

25. I also understand Patent Owner asserted the '708 Patent against Samsung Electronics Co., Ltd. ("Samsung") in the Eastern District of Texas, styled *Telcom Ventures LC v. Samsung Electronics Co., Ltd. et al*, Case No. 2:24-cv-00691-JRG (filed August 21, 2024).

26. I understand Patent Owner asserted the same eight patents against Samsung in that action. I understand that Patent Owner informed Samsung that it was withdrawing its infringement allegations for two patents in the Samsung Litigation (but not the '708 Patent), but Samsung responded the same day by filing declaratory judgment claims of invalidity on all eight of the patents. Accordingly, the validity of all eight patents remains at issue in the Samsung action.

27. I understand that a jury trial for the suit between Patent Owner and Samsung is expected to begin on June 1, 2026. Ex. 2003.

28. I understand that Samsung filed IPR petitions against all eight patents originally asserted by Patent Owner. These are:

- IPR2025-00957, regarding U.S. Patent No. 11,937,172
- IPR2025-00972, regarding U.S. Patent No. 9,832,708
- IPR2025-00973, regarding U.S. Patent No. 9,462,411
- IPR2025-00974, regarding U.S. Patent No. 10,674,708
- IPR2025-00975, regarding U.S. Patent No. 9,832,708
- IPR2025-00976, regarding U.S. Patent No. 11,924,743
- IPR2025-00977, regarding U.S. Patent No. 11,770,756
- IPR2025-00978, regarding U.S. Patent No. 12,028,793

29. I understand Google LLC (“Google”) has filed IPR petitions against seven of the eight patents asserted by Patent Owner in the above litigations. These are:

- IPR2025-01349, regarding U.S. Patent No. 11,924,743
- IPR2025-01389, regarding U.S. Patent No. 11,937,172
- IPR2025-01401, regarding U.S. Patent No. 12,028,793
- IPR2025-01408, regarding U.S. Patent No. 9,832,708
- IPR2025-01409, regarding U.S. Patent No. 11,770,756

- IPR2025-01419, regarding U.S. Patent No. 9,832,708
- IPR2025-01421, regarding U.S. Patent No. 10,674,708

30. As of the signing of this declaration, I have been retained to provide an opinion in all eight IPRs filed by Petitioner against the patents asserted by Patent Owner. I have also been retained to provide an opinion in each of the IPRs filed by Samsung and Google.

VI. LEGAL STANDARDS

31. For purposes of this Declaration, I use the legal principles below as a guide in formulating my opinions. I am not an attorney, and I am not offering any opinions regarding legal matters; however, I have been informed by Telcom Venture's counsel of the legal principles relevant to the issues herein and have the following understanding.

32. In an *inter partes* review proceeding, I understand that a party seeking to invalidate a claim must prove invalidity by a preponderance of the evidence, which I understand to mean evidence that convinces you that it is more likely than not that the particular proposition is true. I understand that the preponderance of the evidence standard applies to all aspects of an allegation of anticipation or obviousness, including the prior art status of the relevant reference(s).

A. Claim Construction

33. I understand the first step in determining whether or not a patent claim is valid is to properly construe the claims. I understand that the words of a claim are generally given their ordinary and customary (sometimes referred to as their plain and ordinary) meaning as understood by a person of ordinary skill in the art at the time of the invention. I also understand that, as a general matter, a claim should not be limited to a preferred embodiment, but that in certain cases, the scope of the right to exclude may be limited by a narrow disclosure or by positions taken, such as by statements made during patent prosecution. I also understand the claims must be supported by the specification. Also, to the extent that a patent claims priority to an earlier filed application, the claims must be supported by the disclosure in that application. For terms that have not been construed, I understand that they should be afforded their plain and ordinary meaning to one of ordinary skill in the art.

34. I understand that the plain and ordinary meaning of a claim term is the meaning a person of ordinary skill in the art would have understood at the time of the effective date in view of the specification and the prosecution history.

B. Obviousness

35. I understand that a claimed invention is not patentable under 35 U.S.C. § 103 if the differences between the invention and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was

made to a person having ordinary skill in the art to which the subject matter pertains. Obviousness, as I understand it, is based on the scope and content of the prior art, the differences between the prior art and the claim, the level of ordinary skill in the art, and objective indicia of non-obviousness to the extent they exist.

36. I understand that whether there are any relevant differences between the prior art and the claimed invention is to be analyzed from the view of a person of ordinary skill in the art at the time of the invention. A person of ordinary skill in the art is a hypothetical person who is presumed to be aware of all of the relevant art at the time of the invention. The person of ordinary skill is not an automaton and may be able to fit together the teachings of multiple patents employing ordinary creativity and the common sense that familiar items may have obvious uses in another context or beyond their primary purposes.

37. I understand that if a reference or proposed combination of references does not disclose or suggest all of the elements of a claim, the combination cannot render the claim obvious. I also understand that in order to combine prior art references to show obviousness, a person of ordinary skill in the art, without knowledge of the claimed invention, or without the use of hindsight, must have been motivated to combine the prior art by some suggestion or teaching in the prior art, the knowledge of one of skill in the art, or the nature of the problem to be solved.

38. I understand that an invention would have been obvious if a designer of ordinary skill in the art, facing the wide range of needs created by developments in the field, would have seen an obvious benefit to the solutions tried by the applicant. When there is a design need or market pressure to solve a problem and there are a finite number of identified, predictable solutions, it may have been obvious to a person of ordinary skill to try the known options. If a technique has been used to improve one device, and a person of ordinary skill in the art would have recognized that it would improve similar devices in the same way, using the technique may have been obvious. I understand, however, that routine experimentation does not necessarily preclude patentability.

39. I understand that obviousness of a patent claim cannot properly be established through hindsight, and that elements from different prior art references, or different embodiments of a single prior art reference, cannot be selected to create the claimed invention using the invention itself as a roadmap. I understand that the claimed invention as a whole must be compared to the prior art as a whole, and courts must avoid aggregating pieces of prior art through hindsight that would not have been combined absent the inventors' insight.

C. Motivations to Combine

1. I understand that in order to show obviousness based on a single reference or a combination of references, a particular motivation to modify the

reference or combine the teachings in the references, and a reasonable expectation of success must be shown.

2. I understand that the art must evidence a motivation to combine or modify the independently known elements to arrive at the claimed invention and an explanation as to how or why the references would be combined to arrive at the claimed invention to solve the particular problem. I understand that a challenger must show that there was a reason that would have prompted a person of ordinary skill in the relevant field to combine the elements in the way the claimed new invention does in an obviousness determination. I also understand that it is not enough to prove obviousness merely by a showing that the references were capable of combination without a suggestion of the desirability of the modification.

3. I understand that there is no single way to define the line between true inventiveness on the one hand (which is patentable) and the application of common sense and ordinary skill to solve a problem on the other hand (which is not patentable). For example, market forces or other design incentives may be what produced a change, rather than true inventiveness. I may consider whether the change was merely the predictable result of using prior art elements according to their known functions, or whether it was the result of true inventiveness. I may also consider whether there is some teaching or suggestion in the prior art to make the modification or combination of elements claimed in the patent. I may consider

whether there is some teaching or suggestion in the prior art to make the modification or combination of elements claimed in the patent. I may consider whether the innovation applies a known technique that had been used to improve a similar devices or method in a similar way. I may also consider whether the claimed invention would have been obvious to try, meaning that the claimed innovation was one of a relatively small number of possible approaches to the problem with a reasonable expectation of success by those skilled in the art.

4. I also understand, however, that I must be careful not to determine obviousness using the benefit of hindsight; many true inventions might seem obvious after the fact. I should put myself in the position of a person of ordinary skill in the field at the time the claimed invention was made and I should not consider what is known today or what is learned from the teaching of the patent.

40. Finally, I understand that any obviousness rationale for modifying or combining prior art must include a showing that a person of ordinary skill would have had a reasonable expectation of success. I further understand that whether a proposed modification or combination of the prior art has a reasonable expectation of success is determined at the time the invention was made.

VII. LEVEL OF ORDINARY SKILL IN THE ART

41. I understand that patent claims are to be interpreted from the viewpoint of one of ordinary skill in the relevant art. To determine the level of skill that would

be “ordinary,” I understand that a person of skill (“POSITA”) must generally have the capability of understanding the general principles that are applicable to the pertinent art.

42. In my opinion, a POSITA would have had at least a bachelor’s degree in electrical engineering, computer engineering, or a related field, with about two years of experience in wireless communications. More work or practical experience may qualify one not having the requisite education as a person with ordinary skill in the art, while a higher level of education could offset less experience. I was at least a person of ordinary skill in the art as of the effective filing dates of the Asserted Patents under this definition.

43. I have reviewed Mr. Lipoff’s Declaration (Ex. 1003). I understand that Mr. Lipoff contends that a POSITA would have had “a bachelor’s degree in computer science, electrical engineering, computer engineering or equivalent from an accredited academic program with a year of work experience with mobile payment systems or wireless communication systems.” Ex. 1003 at ¶46. Mr. Lipoff also contends that a POSITA “would have been knowledgeable regarding the field of mobile communication devices using mobile payment systems and wireless communication systems, including short-range communication technologies” and that “[a] POSITA would have possessed a working knowledge of short-range communication technologies in portable wireless devices.” *Id.* I was at least a person

of ordinary skill in the art as of the effective filing dates of the Asserted Patents under Mr. Lipoff's definition. Thus, I met the requirements of a POSITA under either my definition or Mr. Lipoff's definition as of the priority date of the '708 Patent. Furthermore, whether I apply Mr. Lipoff's definition of a POSITA or my own my opinions herein would not change.

VIII. CLAIM CONSTRUCTION

44. I understand that unless claim terms are provided an express construction, the terms must be given their plain and ordinary meaning.

IX. TECHNOLOGY BACKGROUND

45. Below, I provide a brief overview of the history of contactless smart cards, or proximity cards, and the use of the same technologies in devices.

A. Near Field Communications ("NFC")

46. Near Field Communication ("NFC") is a broad term for short-range wireless communication technology that allows devices to exchange data when they are brought very close together. It is an extension of Radio Frequency Identification ("RFID") technology, designed for secure, quick, and convenient data transfer.

47. NFC-capable devices can communicate with other NFC-capable devices in either active or passive mode. In active mode, both devices generate their own radio frequency field to transmit data. Ex. 2008 at 4. In passive mode, one device generates the radio frequency field while the other responds without a power source. *Id.*

48. A paper by Liu et al. provides a history of NFC, stretching back to the first understanding of the wave theory of light. Ex. 2009 at 4. That paper includes an overview of NFC history which is shown here:

TABLE I: Timeline of NFC Milestones

1678	.....	•	Huygens presented his “Wave Theory of Light”.
1801	.....	•	Young presented the double-slit diffraction experiment.
1815	.....	•	Fresnel presented a series of memoirs about his understanding of diffraction.
1821	.....	•	Fraunhofer constructed the first diffraction grating.
1887	.....	•	Hertz demonstrated the existence of radio waves.
1891	.....	•	Lord Rayleigh calculated the Rayleigh distance $\frac{A^2}{2\lambda}$.
1947	.....	•	Cutler <i>et al.</i> reformulated the Rayleigh distance as $\frac{2A^2}{\lambda}$.
1956	.....	•	Polk calculated the Fresnel distance.
1983	.....	•	The first patent on RFID-based NFC was granted.
1984	.....	•	Winters formulated the initial theory of MIMO.
1994	.....	•	The first patent on MIMO was granted.
1996	.....	•	Foschini laid down crucial theoretical foundations for MIMO.
1999	.....	•	Driessen and Foschini utilized a spherical wave-based model to characterize LoS MIMO.
2003	.....	•	Jiang <i>et al.</i> proposed to use spherical wave-based models to describe short-range MIMO.
2010	.....	•	Marzetta proposed the concept of massive MIMO.
2015	.....	•	Channel measurement results on massive MIMO necessitated the use of a spherical wave-based channel model.
2016	.....	•	Prather proposed the concept of holographic MIMO.
2017	.....	•	Hu <i>et al.</i> re-showed the potential of large intelligent surfaces in enhancing wireless transmissions.
2018	.....	•	Amiri <i>et al.</i> proposed the concept of ELAA.
2023	.....	•	The first tutorial review of NFC was presented.

49. Despite the long history of the physics and technology supporting NFC, NFC itself is relatively new. For example, the NFC Forum was created in 2004 to ensure maximum compatibility across all implementations of NFC technology. Ex. 2010 at 1. But the NFC Forum was not even founded until many years after the first standards related to smart cards were published. As late as 2012, *see* Ex. 2011

at 1, and even 2015, some sources still referred to NFC as an “emerging technology.”
Ex. 2012 at 1.

50. Within the umbrella of NFC, there are numerous individual standards that are more specific. One such standard is ISO/IEC 14443. The ISO/IEC 14443 standard has four parts. Part 1 defines the physical properties of the card (e.g., size, durability, environmental tolerance). Part 2 specifies how the card is powered by the RF field of the reader and how modulation/coding are done for transmitting and receiving signals. Part 3 describes card initialization and how multiple cards in the field are identified and selected (anti-collision protocol). Part 4 defines higher-level data exchange protocols, including how commands and responses are structured.

51. The specificity of individual NFC standards means that any such standard is self-sufficient. In other words, a POSITA consulting one of these standards, such as ISO/IEC 14443, would have a complete solution for near field communications and would not need to look to other standards or technologies.

X. U.S. PATENT NO. 9,832,708 (“’708 PATENT”) (EX. 1001)

A. Priority Date

52. The ’708 Patent is a continuation of U.S. Patent Application No. 12/264,711, filed on November 4, 2008, which issued as U.S. Patent No. 9,462,411 on October 4, 2016.

53. I understand that Mr. Lipoff does not challenge this priority date for purposes of the Petition. For the purposes of Patent Owner's Preliminary Response, I have assumed that each of the challenged claims is entitled to at least a priority date of November 4, 2008. Ex. 1003 ¶32.

B. '708 Patent Overview

54. The '708 Patent describes mobile wireless devices and methods of using a mobile wireless device to engage in one or more communications modes, but only when certain conditions or criteria are met, such as the satisfaction of a proximity condition and a value of a parameter, e.g., a physiological parameter, satisfying a criterion. Ex. 1001, 1:17-22; 6:9-29. The specification recognizes that the devices in the art were rigidly configured to perform a predetermined number of functions. *Id.*, 1:31-39. The '708 Patent addresses this rigidity problem by providing devices and methods that "may be used to enable adaptively one or more modes/functions of a device" based upon the satisfaction of certain criteria. *Id.*, 1:43-45. The specification explains that the invention advantageously allows "a mobile wireless device [to] act as a 'wallet' (over and above other functions) only when it is time to pay for an item and not act as a wallet when there is no need to do so." *Id.*, 1:36-39.

C. The '708 Patent's Prosecution History

55. I have reviewed the prosecution history of the '708 Patent.

56. U.S. Patent No. 15/251,882 was filed on August 30, 2016, and issued as U.S. Patent No. 9,832,708 on November 28, 2017.

57. The Examiner issued a non-final rejection of initial proposed claims 1-8 for double patenting in light of claims 1-4 of U.S. Patent No. 9,462,411 and as obvious in light of U.S. Patent Application 2003/0220105 to Daigremont et al., and U.S. Patent Application 2007/0243872 to Gallagher et al. Ex. 1002 at 59-60.

58. In response, Applicant filed a terminal disclaimer over the '411 Patent. Ex. 1002 at 129, 131. Applicant traversed the Examiner's obviousness rejection with respect to initial proposed claims 1-3 and 5-7, amended initial proposed claims 4 and 8, and proposed new claims 9-28. Ex. 1002 at 98-107.

59. In its Remarks, Applicant did not concede that "the above-discussed recitations (i)-(iii) of independent Claims 1 and 5 have no novelty" but for expediency focused on the "wherein" recitation of independent Claims 1 and 5 by which the recitations of "(i) and (iii) are performed concurrently." Ex. 1002 at 109. Recitations (i)-(iii) were "(i) communicating between a smartphone and an entity using a first air interface responsive to a proximity criterion having been satisfied, (ii) refraining from communicating between the smartphone and the entity using the first air interface absent the proximity criterion having been satisfied, and (iii) communicating using a second air interface to receive a communications service by

the smartphone, but not receiving the communications service from the entity via the first air interface.” Ex. 1002 at 108.

60. On October 12, 2017, Applicant and Examiner participated in an interview, during which Applicant authorized the Examiner to cancel proposed claims 19-27 by Examiner’s Amendment to “expedite prosecution of the application in condition for allowance.” Ex. 1002 at 144.

61. The Examiner issued a Notice of Allowance on October 18, 2017 for proposed claims 1-18 and 28. Ex. 1002 at 135, 140.

XI. ASSERTED REFERENCES

A. Carlson (Ex. 1005)

5. U.S. Patent No. 8,229,852 to Carlson is titled “Secure Mobile Payment System.” Carlson is directed to portable wireless devices that are used to conduct contactless payment transactions in a secure manner. Carlson, 1:16-20.

6. Carlson explains that “[d]ue to the wireless nature of the contactless reader, it is possible that the contactless reader may be used for surreptitious interrogation of the portable wireless device by intercepting the portable wireless device’s communication.” Carlson, 1:64-2:1. Carlson further explains that “it is conceivable that a contactless reader may be developed or modified to enhance its power and sensitivity and thereby increase its ability to interrogate with and intercept

signals from the portable wireless device from a greater distance than specified in standards used for contactless readers.” Carlson, 2:1-6.

7. Carlson describes “[t]heft of sensitive information, such as an account number, using wireless interrogation or interception of communications from portable wireless device” as a “major concern for consumers and businesses alike.” Carlson, 2:7-10. Carlson notes that wireless interrogation can “occur at virtually any time and place,” and “[o]nce the victim of the wireless interrogation discovers that they had sensitive information stolen, it is often too late to discover where the theft took place.” Carlson, 2:10-16. As a result, “[t]he victim must then deal with the consequences and hassle of correcting the unauthorized access and possible uses of the information.” Carlson, 2:16-18.

8. Carlson describes other “safeguards for protecting purchase from fraudulent attacks,” including employing encryption technologies to encrypt the payment account number and other data associated with account transactions. Carlson, 2:19-23. Carlson explains that many merchants avoid implementing or upgrading to the latest encryption technology “[d]ue to the cost, time, and risk of potential business interruption (e.g., loss of sales).” Carlson, 2:27-35.

9. Carlson’s solution describes the use of “pseudo account identifiers” or “PPAI.” Carlson, 2:62-63. . According to Carlson, “[p]seudo primary account identifiers may include identifiers that are similar in format to a consumer’s real

account identifier.” Carlson, 5:30-32. “These account identifiers may include account numbers or any other alphanumeric sequence.” Carlson, 2:66-3:1. Carlson also describes the pseudo account identifier as “bogus, fake, decoy, substitute, or the like.” Carlson, 5:42-43. “

62. Carlson describes “a method for conducting a transaction that includes receiving a pseudo account identifier that corresponds to a consumer’s account identifier.” Carlson, 3:3-6. In some embodiments of Carlson, “the pseudo primary account identifier may not be requested at all, but rather is pushed to the portable wireless device at any time, such as when the device is turned on, when the device is idle, periodically, or through any other such criteria.” Carlson, 7:4-7, 12:67-13:3. Carlson also explains that “the pseudo primary account identifier may not be requested by the portable wireless device at all” and “[t]he portable wireless device may generate the pseudo primary account identifier.” Carlson, 7:15-19.

B. ISO-14443 (Ex. 1016)

63. The ISO/IEC 14443 standard has four parts. Part 1 defines the physical properties of the card (e.g., size, durability, environmental tolerance). Part 2 specifies how the card is powered by the RF field of the reader and how modulation/coding are done for transmitting and receiving signals. Part 3 describes card initialization and how multiple cards in the field are identified and selected

(anti-collision protocol). Part 4 defines higher-level data exchange protocols, including how commands and responses are structured.

64. ISO-14443 “is one of a series of International Standards describing the parameters for identification cards as defined in ISO/IEC 7810 and the use of such cards for international interchange.” ISO-14443, 4.

C. Jazayeri (Ex. 1007)

65. U.S. Patent Application Publication No. 2008/0155268 to Jazayeri is directed to “[a]n architecture . . . that controls access to secure data via biometric verification.” Jazayeri, Abstract. Jazayeri discloses a “memory module that communicates with biometric data to establish a heightened level of security for controlling access to data stored in the non-volatile memory.” *Id.* “Specifically, biometric data is input and communicated to the security processor, then compared against the existing biometric templates stored in the non-volatile memory. If the data matches, verification is sent to the external processor and the user is granted access to the secure assets.” *Id.*

66. Jazayeri requires a security processor. Jazayeri, ¶[0006] (“As the security processor controls access to the entire non-volatile memory space and monitors all traffic to and from the non-volatile memory components, the security processor is able to manage access to the secure assets stored in the non-volatile memory.”); *see also* Jazayeri, ¶¶[0024], [0025], [0027], [0028], [0030], Figs. 1, 2.

Jazayeri explains that “[o]nly the security processor 104 accesses the security software from the nonvolatile memory 102 and performs security functions based on the specific security software being executed.” Jazayeri, ¶[0027].

67. Figure 3 of Jazayeri illustrates a block diagram of the Jazayeri’s security processor.

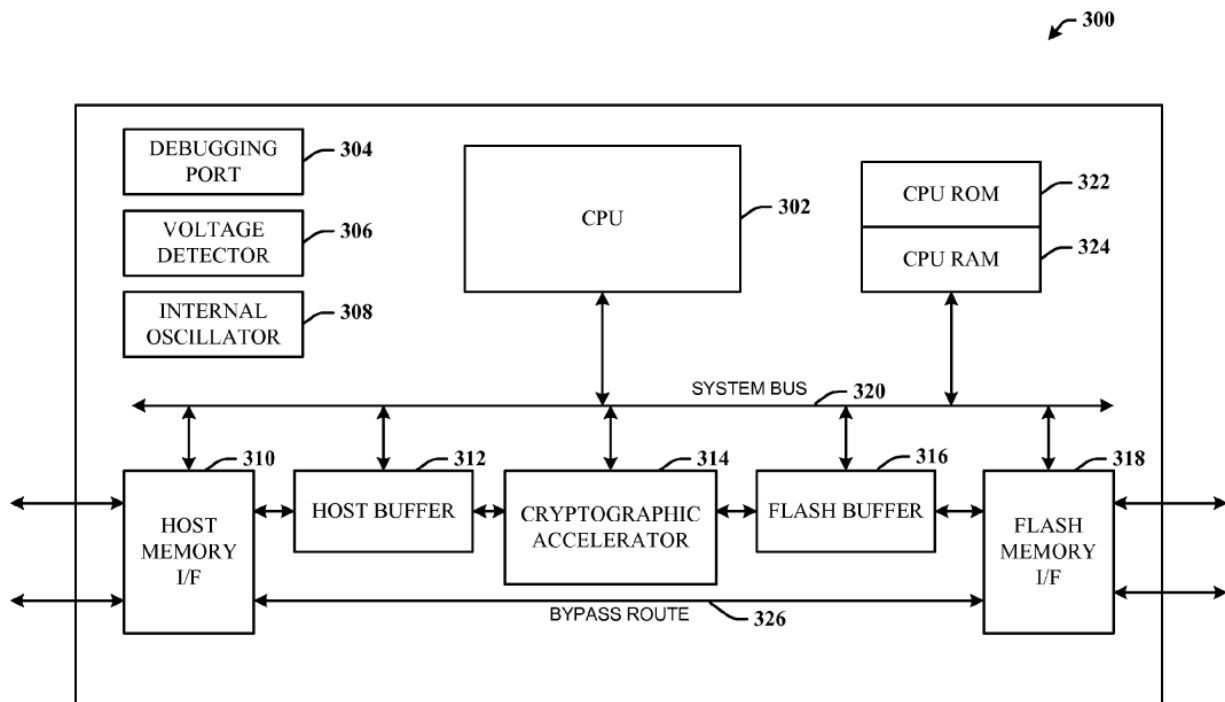


FIG. 3

Jazayeri, Fig. 3. Jazayeri’s security processor comprises sophisticated hardware. Jazayeri explains that “[a] cryptographic accelerator 314 . . . performs all the cryptographic algorithms, symmetric and a-symmetric needed by the system.” Jazayeri, [0033].

D. Birch (Ex. 1031)

68. U.S. Patent. No. 7,213,742 to Birch et al. describes a system that includes a mobile device comprising a wireless communications technology that enables the device to communicate with a back-end system. Birch, Abstract. This communication with the back-end system enables the device to obtain coupons and discounts for the transaction and e-receipts post-transaction. *Id.*, 7:55-60, 13:19-35.

XII. THE CHALLENGED CLAIMS OF THE '708 PATENT WOULD NOT HAVE BEEN OBVIOUS

A. Petitioner's Grounds 1–3 Fail Because the Challenged Claims Would Not Have Been Obvious Over the Asserted References.

69. The following paragraphs address examples of why the challenged claims would not have been obvious in view of Carlson in combination with ISO-14443.

70. While I address certain limitations and combinations to demonstrate that each of the challenged claims is not unpatentable, I reserve the right to supplement this declaration to include additional information and opinions related to any and all challenged claims and claim elements and the asserted Grounds and prior art references.

71. In Ground 1, Mr. Lipoff opines that Carlson in view of ISO-14443 renders obvious independent claims 1, 11, 16, and 18. Claims 2 through 10 depend directly or indirectly from claim 1, and thus include all limitations of claim 1. Claims 12 through 15 depend directly or indirectly from claim 11, and thus include all

limitations of claim 11. Claim 17 depends from claim 16 and thus includes all limitations of claim 16. Claim 19 includes all limitations of claim 18 and thus includes all limitations of claim 18.

72. Mr. Lipoff fails to show that Carlson in view of ISO-14443 teaches all the limitations of the '708 Patent's independent claims, including "communicating between the smartphone and the entity using the first air interface . . . is performed concurrently with the communicating between the smartphone and the base station using the second air interface."

1. ***Carlson does not disclose and would not have rendered obvious "communicating between the smartphone and the entity using the first air interface . . . is performed concurrently with the communicating between the smartphone and the base station using the second air interface."***

73. Claim element 1[d] requires "communicating between the smartphone and the entity using the first air interface . . . is ***performed concurrently*** with the communicating between the smartphone and the base station using the second air interface." The other independent claims of the '708 Patent have similar limitations. '708 Patent, Cl. 11[e] ("communicating between the smartphone and the entity using the first air interface . . . is performed concurrently with the communicating between the smartphone and the base station using the second air interface"), 16[d] ("communicating between the smartphone and the entity using the first air interface . . . is performed concurrently with the communicating by the smartphone

using the second air interface”), 18[e] (“communicating between the smartphone and the entity using the first air interface . . . is performed concurrently with the communicating by the smartphone using the second air interface”). All dependent claims depend from claims 1, 11, 16, and 18, and therefore include this “performed concurrently” limitation.

74. To meet claim element 1[d],⁵ Mr. Lipoff identifies (1) “communicating information between the wireless device (*smartphone*) and the access device (*entity*) by *providing information*, in the form of the PPAI, to the *entity* using NFC” as the claimed “communicating between the smartphone and the entity” (Ex. 1003, ¶¶102, 115), and (2) “wirelessly requesting and receiving a PPAI from a payment processing network using long-range cellular communication (*second air interface*)” as the claimed “communicating between the smartphone and the base station” (Ex. 1003, ¶¶87, 107–108, 115). *See* Ex. 1003, ¶112 (incorporating discussion of elements 1[a] and 1[c] into discussion of 1[d]). Mr. Lipoff then suggests that these two processes are “performed concurrently” because “Carlson does not teach or

⁵ For claim elements 11[e], 16[d], and 18[e], Mr. Lipoff only incorporates his discussion of claim element 1[d] and does not provide any additional analysis. Ex. 1003, ¶¶136, 145, 154. As a result, 11[e], 16[d], and 18[e] rise and fall with the analysis of 1[d].

suggest disabling either communication mode during these processes, and a POSITA would understand that disabling one communication mode to favor the other was not required of multi-mode devices at the time.” Ex. 1003, ¶115. I disagree.

75. Mr. Lipoff’s mapping fails for three reasons. Carlson discloses *first* requesting and receiving a PPAI via long range communication *and then* later sending the PPAI to a contactless reader. A POSITA would have understood that communicating a request and receiving a PPAI via long range communication must come before that PPAI may be used in a financial transaction and, thus, Carlson’s device does not “perform[] concurrently” the identified communications. Next, a POSITA would not have been motivated to communicate Carlson’s PPAI request concurrently with Carlson’s financial transaction. Finally, Mr. Lipoff fails to show that Carlson teaches the “performed concurrently” limitation because, at best, he only purports to show that Carlson does *not* disclose “a mutually exclusive selection between communication paths,” but does not and cannot affirmatively demonstrate that the identified communications are “perform[ed] concurrently.”

76. *First*, Carlson discloses a two-step process for conducting a financial transaction using PPAI. Specifically, Mr. Lipoff relies exclusively on a single embodiment in Carlson where the wireless device requests and receives the PPAI from the payment processing network. *See, e.g.*, Ex. 1003, ¶¶87, 90, 107–108, 115. In this embodiment, Carlson discloses that, after the user selects an account to

perform a transaction, “the portable wireless device may then access the communications network through the use of one or more wireless access points provided by the network.” Carlson, 6:19-22. “Upon gaining access to the communications network, in this exemplary embodiment, the portable wireless device may send a request through the communications network to a payment processing network in order to retrieve a [PPAI] that corresponds to the primary account identifier that was previously selected.” Carlson, 6:32-37. Then, “[t]he payment processing network can respond to the request from the portable wireless device with a response message that contains a [PPAI]” and “[t]he response can be sent over the communications network back to the portable wireless device.” Carlson, 6:50-55. In this embodiment, it is only *after* Carlson’s device has received a PPAI over a cellular network—or failed to receive a PPAI⁶—that “the user may then proceed to use the portable wireless device to conduct a transaction.” Carlson, 7:43-47. Therefore, Carlson discloses the request for PPAI (using a cellular network) comes before—not “performed concurrently” with—any PPAI-based financial

⁶ Carlson’s device may also move forward without the PPAI if the device fails to retrieve a PPAI in response to its request, but the request must still come *before* a non-PPAI-based financial transaction. *See* Carlson, 14:24-33.

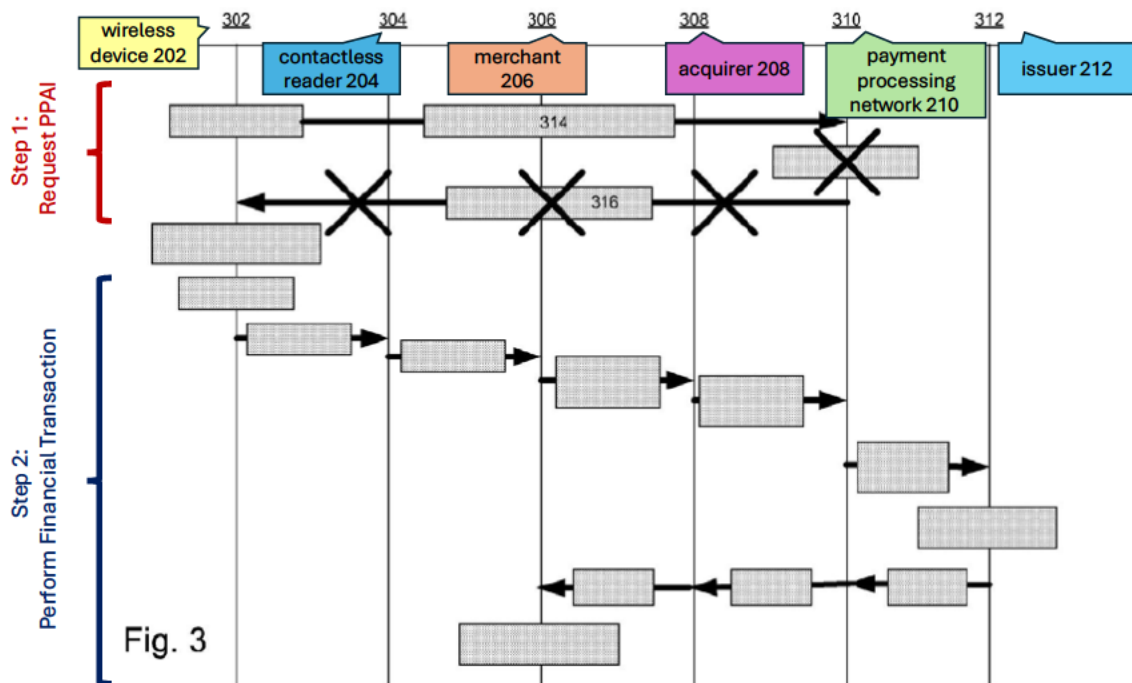
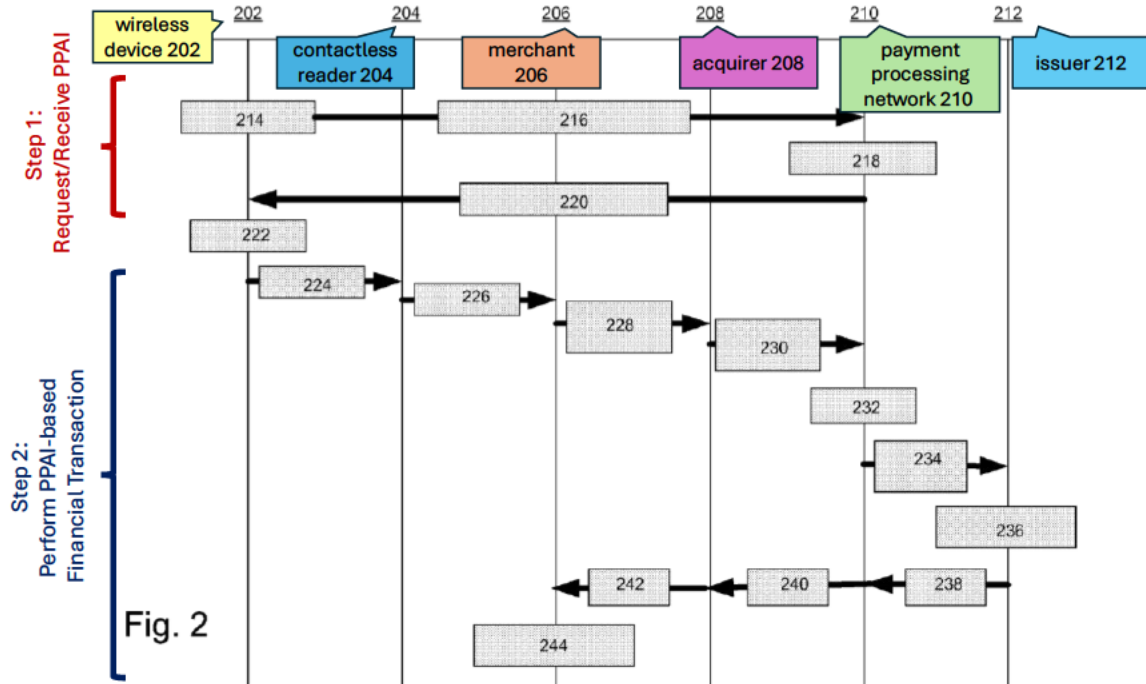
transaction using NFC, which logically follows because a PPAI would need to be received before it could be used in a transaction.

77. Carlson's Figures 2 and 3⁷ emphasize that communicating the request for PPAI must come *before* Carlson's financial transaction. Figures 2 and 3 are described by Carlson as "message flow diagram[s] illustrating message flows." Carlson, 5:1-6, 12:13-15, 13:58-59. Carlson discloses that "the portable wireless device 202 may [] request a [PPAI] that corresponds with a primary account identifier from the payment processing network 210." Carlson, 12:34-37. "The [PPAI] may then be returned to the portable wireless device 202 through the communications network 220." Carlson, 12:56-59. It is only *after* Carlson's device receives the PPAI that the financial transaction may continue.⁸ Carlson discloses that "[t]hrough the use of the short range communications element in the portable device

⁷ According to Carlson, Figure 3 "is for the most part the same as that of" Figure 2 and "[t]he difference is at the point where the portable wireless device requests 314 and receives 316 the [PPAI]." Carlson, 13:58-61.

⁸ In Figure 3, Carlson's device continues using the same message flow "with the exception that the primary account identifier is used instead of the PPAI." Carlson, 13:61-65.

202, the pseudo primary account number may be transmitted 224 to the contactless reader 204 and to the merchant 206, 226.” Carlson, 13:14-18.



Carlson, Figs. 2, 3 (annotated).

78. Mr. Lipoff does not dispute that the request for PPAI in Carlson *must come before* a PPAI-based financial transaction. *See, e.g.*, Ex. 1003, ¶90 (“Once the PPAI has been received at the device, the user may conduct a financial transaction” (citing Carlson, 12:56-60, 13:10-13, Figs. 1-2)), ¶107 (“Once the portable wireless device has received the [PPAI] the transaction may continue.” (quoting Carlson, 13:10-11, 12:59-61)), ¶109 (“Carlson discloses that *prior to* sending the PPAI to the access device, the wireless device wirelessly requests and receives a PPAI from a payment processing network through wireless access point 118 and communications network 116” (citing Carlson, 10:7-18, 14:60-65, Fig. 1)), ¶115 (“*After* the PPAI is received, Carlson’s device communicates the PPAI to a POS terminal via NFC (first air interface) to further a financial transaction.” (emphasis added)). As such, a POSITA would have understood that communicating a request and receiving a PPAI via long range communication *must come before* that PPAI may be used in a financial transaction and, thus, Carlson’s device does not “perform[] concurrently” the identified communications.

79. *Second*, a POSITA reading Carlson would not have been motivated to communicate a request for PPAI “concurrently” with a PPAI-based financial transaction. A POSITA would have understood that it is impossible to perform a PPAI-based transaction until *after* obtaining a PPAI. Indeed, Carlson emphasizes that a PPAI should be obtained before conducting the financial transaction so that

“the user does not experience any delay in conducting the purchase.” Carlson, 15:63-67.

80. Mr. Lipoff fails to identify *any* disclosure in Carlson of communication over a long-range cellular communication network “performed concurrently” with a PPAI-based financial transaction. Although Mr. Lipoff acknowledges that Carlson’s long-range cellular communication network can be used for communications other than requesting and receiving a PPAI (Ex. 1003, ¶110 (Limitation 1[c]) (quoting Carlson, 5:65-6:3)), Carlson never suggests that *Carlson’s device* would actually perform any communication over the cellular telephone network *concurrently* with a PPAI-based financial transaction. Carlson merely teaches that the communications network used to request and receive PPAI “may also be used for data communications, to enable the user to perform tasks such as surfing the internet, reading e-mail, or any other tasks that are associated with a general purpose data network.” Carlson, 5:65-6:3.

81. For example, Carlson never discloses using the device to “surf[] the internet” or “read[] e-mail” while concurrently performing the steps described by Carlson to complete a PPAI-based financial transaction. Indeed, reading an e-mail while also performing Carlson’s financial transaction would be impractical because Carlson requires the user to “hold the portable wireless device 202 in the vicinity 222 of the contactless reader.” Carlson, 13:10-13. In fact, Carlson’s concerns with

data interception and interrogation teaches away from performing potentially risky communications concurrently with a financial transaction because doing so would provide another opportunity for a bad actor to intercept sensitive information or gain access to Carlson’s device. Carlson, 1:62-2:6. Thus, even if Mr. Lipoff had identified a different communication, a POSITA would not have understood Carlson to render obvious any type of communication to be “performed concurrently” with Carlson’s PPAI-based financial transaction. Carlson’s general disclosure of a communications network is not sufficient to render this claim obvious.

82. **Third**, Mr. Lipoff plainly fails to show that Carlson teaches the “performed concurrently” limitation. He only purports to show what Carlson does **not** teach: “a mutually exclusive selection between communication paths.” *See, e.g.*, Ex. 1003, ¶115 (“Carlson does **not** teach or suggest disabling either communication mode during these processes.” (emphasis added)). But, when determining whether a claim is obvious, the question is **not** what Carlson does **not** teach; rather, the question must be what does Carlson actually teach. Here, Carlson expressly discloses that communicating the request for PPAI must come before the PPAI-based financial transaction, and that the communications are therefore not concurrently performed. Thus, Mr. Lipoff’s analysis fails.

83. Mr. Lipoff attempts to rely on the prosecution history to advocate for a particular interpretation of “performed concurrently.” Ex. 1003, ¶113 (concluding

that “[a] POSITA would understand that disabling one air interface to utilize a second air interface, is a mutually exclusive mode selection that would **not** satisfy the concurrent requirement of limitation 1(d)” (citing Ex. 1002 at 110-111)). But Mr. Lipoff cannot show that Carlson discloses a limitation merely by distinguishing it from prior art cited during prosecution. Although Applicant distinguished “performed concurrently” from “mutually exclusive mode selection” during prosecution, *see* Ex. 1002 at 111 (“Applicant submits that a **mutually exclusive selection** in Gallagher or either (a) the licensed wireless communications session 106 or (b) the ICS access interface 100 does **not** disclose or suggest the **concurrent performance** recited in independent Claims . . .”), I disagree that “performed concurrently” should be interpreted to mean “anything that is not mutually exclusive mode selection,” as Mr. Lipoff suggests. A “mutually exclusive mode selection” is just one example of a system that would not satisfy the “performed concurrently” requirement of limitation 1[d] and the other independent claims. Thus, Mr. Lipoff’s arguments that distinguish Carlson from a “mutually exclusive mode selection” fall short of showing that Carlson’s request for PPAI and PPAI-based financial transaction are “performed concurrently,” as claimed.

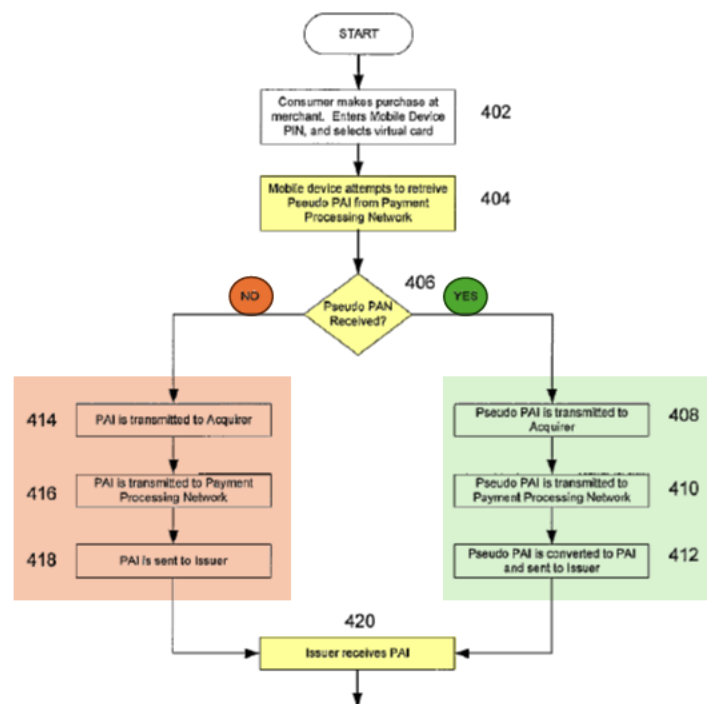
84. Mr. Lipoff also points to an unasserted reference, Sherman, as what “a POSITA would understand” about multi-mode devices. Ex. 1003, ¶115 (“Sherman . . . teaches that ‘cellular phones today support both the basic primary

cellular communications connection as well as support one or more secondary connections such as Bluetooth and Wireless Local Area Network (WLAN).” (quoting Ex. 1014, ¶[0003])); *id.* (“Sherman specifically taught a mobile device comprising both a Bluetooth radio and a WiMAX radio where both radios ‘communicate at the same time.’” (quoting Ex. 1014, ¶0015)). But, Mr. Lipoff does not provide *any* reason a POSITA would have understood Sherman’s Bluetooth-WiMAX teachings to be applicable to Carlson’s long-range communications network and NFC-based financial transaction.

85. Further, Sherman is directed to solving a problem related to “the small frequency separation between [the WiMAX and Bluetooth frequency] bands.” Ex. 1014, ¶[0014]. Sherman is silent as to NFC and the ISO-14443 standard, on which Mr. Lipoff relies, and Sherman’s teachings are not applicable to Carlson’s system. Sherman also does not disclose a method for securing financial transactions, like Carlson. Carlson, 1:16-20. Worse, Mr. Lipoff never addresses Carlson’s primary concerns with risky wireless communications. Indeed, Carlson’s concerns with securing financial transactions would teach away from concurrent communications because doing so would provide another opportunity for a bad actor to intercept sensitive information or gain access to Carlson’s device. Carlson, 1:62-2:6.

86. Last, Mr. Lipoff suggests that, because Carlson teaches an “alternative message flow” when the communications network is unavailable to the device, then

“a POSITA would understand that Carlson’s default mode keeps both air interfaces—the NFC air interface and cellular air interface—active and does not intentionally disable either interface during operation.” Ex. 1003, ¶115. However, Mr. Lipoff mischaracterizes Carlson. Carlson does not teach a “default” and “alternative” mode. Indeed, Carlson emphasizes that the message flows are “for the most part the same” and that these options are part of the same process. Carlson, 13:58-61. For example, Figure 4 shows the two pathways for conducting the same financial transaction with or without the communications network.



Carlson, Fig. 4 (annotated). In fact, this teaching in Carlson undercuts any argument that communicating a request for PPAI and performing a PPAI-based transaction are “performed concurrently” because Carlson expressly discloses that the PPAI-based

transaction may proceed without access to the communications network at all. Carlson, 13:46-48 (“In some cases, the communications network that may be used to request a [PPAI] number may not be available.”); *see also* Carlson, 14:34-59, Figs. 3, 4. Moreover, Mr. Lipoff again fails to show that the communications are “performed concurrently” and defaults to arguing that Carlson does *not* show: “intentionally disabl[ing] either interface during operation.” Ex. 1003, ¶115. Notably, Mr. Lipoff is wrong that neither interface is disabled because Carlson discloses that the short-range wireless transmission element must be enabled prior to use—and thus is necessarily disabled at some point. Carlson, 2:39-43.

87. Therefore, for at least these reasons, Carlson fails to disclose or render obvious “communicating between the smartphone and the entity using the first air interface. . . is *performed concurrently* with the communicating between the smartphone and the base station using the second air interface” of independent claims 1, 11, 16, and 18, and thus all dependent claims as well.

XIII. SUMMARY AND OTHER REMARKS

88. It is my opinion that Petitioner has failed to show that any of the Challenged Claims set forth in Grounds 1-3 are unpatentable as obvious as explained above.

89. My opinions expressed in this Declaration are based on the information available to me at this time. To the extent that any additional information becomes available, I reserve the right to supplement any opinions contained herein.

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.

Executed on November 6, 2025.



William C. Easttom II (Chuck Easttom)