

UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE PATENT TRIAL AND APPEAL BOARD

APPLE INC.,

Petitioner

v.

FINTIV, INC.,

Patent Owner

Case No.: IPR2023-00398
U.S. Patent No. 10,438,196

Title: USING A MOBILE WALLET INFRASTRUCTURE TO SUPPORT
MULIPLE MOBILE WALLET PROVIDERS

DECLARATION OF MICHAEL I. SHAMOS, PH.D.

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I. INTRODUCTION

1. My name is Michael Shamos. I have been retained as an expert witness by Patent Owner Fintiv, Inc. (“Fintiv” or “Patent Owner”) for this *Inter Partes* Review IPR2023-00398 of U.S. Patent No. 10,438,196 (the “’196 Patent”) filed by Apple Inc. (“Apple” or “Petitioner”).

2. In the Petition, I understand that Petitioner is challenging the validity of Claims 1-22 (the “Challenged Claims”) of the ’196 Patent (Ex. APPL-1001), constituting all the claims of Patent, on the grounds of obviousness.

3. I have been asked to consider whether the Challenged Claims of the ’196 Patent would have been obvious to a person of ordinary skill in the art (“POSITA”) as of the date of the invention. I was also asked to review and comment on several technical statements made by Petitioner in the Petition and by its expert, Dr. Henry Houh, in the “Declaration of Dr. Henry Houh, Under 37 C.F.R. § 1.68 in Support of Petition for *Inter Partes* Review,” dated December 18, 2022 (“Houh Declaration,” Ex. APPL-1003).

4. This Declaration contains statements of my opinions formed in this case to date and the bases and reasons for those opinions. I may offer additional opinions based on further review of materials in this case, including opinions and/or testimony of other expert witnesses.

II. QUALIFICATIONS

5. This section summarizes my educational background, career history, publications, and other relevant qualifications. My curriculum vitae is attached as Patent Owner's Exhibit 2002, which includes my detailed employment background, professional experience, and list of publications.

6. I have an A.B. degree from Princeton University in Physics, an M.A. degree from Vassar College in Physics, an M.S. degree from American University in Technology of Management, an M.S. degree from Yale University in Computer Science, an M. Phil. from Yale University in Computer Science, a Ph.D. from Yale University in Computer Science, and a J.D. degree from Duquesne University.

7. I currently hold the title of Distinguished Career Professor in the School of Computer Science at Carnegie Mellon University in Pittsburgh, Pennsylvania. I am a member of two departments in that School, the Software and Societal Systems Department and the Language Technologies Institute. I was a founder and Co-Director of the Institute for eCommerce at Carnegie Mellon from 1998-2004 and from 2004-2018 have been Director of the eBusiness Technology graduate program in the Carnegie Mellon University School of Computer Science. Since 2018, I have been Director of the M.S. in Artificial Intelligence and Innovation degree program at Carnegie Mellon.

8. I have taught graduate courses at Carnegie Mellon in Electronic Commerce, including eCommerce Technology, Electronic Payment Systems, Electronic Voting, Internet of Things, Ubiquitous Computing, Electronic Payment Systems and eCommerce Law and Regulation, as well as Analysis of Algorithms. Since 2007, I have taught an annual course in Law of Computer Technology. I currently also teach Artificial Intelligence and Future Markets.

9. I am the author and lecturer in a 24-hour video course on Internet protocols and have taught computer networking, wireless communication and Internet architecture since 1999.

10. From 2001-2021, I was a Visiting Professor at the University of Hong Kong, where I taught an annual course in Electronic Payment Systems. This is one of only a handful of graduate courses taught on this subject in the world.

11. I was the Director of Carnegie Mellon's graduate degree program in eBusiness Technology from 1999-2018 and am now a faculty member in the Privacy Engineering degree program at Carnegie Mellon. My course on Law of Computer Technology is required for all students in that program.

12. I am a named inventor on the following six issued patents relating to electronic commerce: U.S. Patent Nos. 7,330,839; 7,421,278; 7,747,465; 8,195,197; 8,280,773; and 9,465,299.

13. From 1979-1987 I was the founder and president of two computer software development companies in Pittsburgh, Pennsylvania, Unilogic, Ltd. and Lexeme Corporation.

14. I am an attorney admitted to practice in Pennsylvania and have been admitted to the Bar of the U.S. Patent and Trademark Office since 1981. I have been asked to render opinions in this declaration as a technical expert. I have not been asked to offer any opinions on patent law in this proceeding.

15. I have previously served as an expert in over 350 cases concerning computer technology. In particular, I have been involved in at least 35 cases involving electronic payment systems.

III. COMPENSATION

16. I am being compensated for my work in this case at the rate of \$575 per hour. I am also reimbursed for all reasonable expenses that I incur during the course of this case. My compensation does not depend upon the results of my analysis or the substance of my testimony, nor does my compensation depend on the outcome of this or any related proceeding. I have no personal interest in the outcome of this matter. I have no financial interest in Patent Owner or affiliation with any of the real parties in interest, the Patent Owner or the named inventor of the '196 Patent. It is conceivable that I may own mutual funds whose portfolios

include stock in Petitioner. If this is the case, the value of such holding would not constitute a material part of my net worth.

17. The statements made and opinions provided in this Declaration are based on my own personal knowledge and, if called as a witness, I could and would testify in a manner consistent with this Declaration.

18. In this Declaration, all emphasis in boldface has been added unless otherwise noted.

IV. MATERIALS CONSIDERED

19. I have reviewed the following documents in forming the opinions expressed in this Declaration:

- All materials filed in this IPR up to and including this date
- Prosecution history of U.S. patent application 14/928,521, now U.S. Patent 10,438,196

20. I have also relied on my education, skill, training, and experience in the relevant fields of technology in forming my opinions. I have further considered the viewpoint of a person of ordinary skill in the art (“POSITA”) as of the time of the inventions of the ’196 Patent. I provide my opinion as to the proper level of skill of a POSITA in Section VII of this Declaration.

21. I reserve the right to supplement my opinions as expressed in this Declaration to address any new information obtained in the course of this proceeding, or based on any new positions taken by Petitioner.

V. SUMMARY OF MY OPINIONS

22. It is my understanding that the following table summarizes the grounds of challenge to the Challenged Claims raised in the Petition:

Ground	Invalidity Challenge	References	Challenged Claims
1	§ 103	Dill, Vadhri, and Akashika	1-22

23. After a review of the alleged prior art asserted by Petitioner and the Houh Declaration, it is my opinion that Petitioner has not shown a reasonable likelihood of success on the sole ground of the Petition. My opinions, and the bases therefore, are detailed throughout this Declaration.

VI. LEGAL PRINCIPLES

24. Counsel for Patent Owner has informed me of the legal principles that apply in this proceeding.

25. I have been informed that Petitioner has the burden to prove that the claims challenged in the Petition are not patentable by a preponderance of the evidence, which I understand to be just enough evidence to make it more likely than not that Petitioner's argument is correct.

26. A claim is invalid as obvious under 35 U.S.C. § 103 if the differences between the subject matter sought to be patented and the prior art are such that the subject matter of the claim as a whole would have been obvious at the time of the invention to a person having ordinary skill in the art to which the invention pertains. I have been informed that the following factors are used to determine whether or not the claimed subject matter would have been obvious: (i) the scope and content of the prior art; (ii) the differences, if any, between the prior art and the claimed invention; (iii) the level of ordinary skill in the field of the invention; and (iv) any relevant objective considerations of non-obviousness.

27. A party asserting obviousness based on a combination of prior art references must demonstrate that one of ordinary skill in the art would have been motivated to combine the teachings of those references to achieve the claimed invention, and that the skilled artisan would have had a reasonable expectation of success in doing so. It is my understanding that it is not enough to show that one skilled in the art could combine elements of multiple references, but instead there must be some reason that would have prompted a person of ordinary skill in the art to combine the elements in the way the claimed invention does. I understand that there must be some reasoned explanation as to why one of ordinary skill in the art would combine the references.

28. I understand that obviousness may be shown by considering more than one item of prior art and by considering the knowledge of a person of ordinary skill in the art, and that obviousness may be based on various rationales including: (i) combining prior art elements according to known methods to yield predictable results; (ii) simple substitution of one known element for another to obtain predictable results; (iii) use of known techniques to improve similar devices in the same way; (iv) applying a known technique to a known device ready for improvement to yield predictable results; (v) “obvious to try” – choosing from a finite number of identified, predictable solutions, with a reasonable expectation of success; (vi) known work in one field of endeavor may prompt variations of it for use in either the same field or a different one based on design incentives or other market forces if the variations are predictable to one of ordinary skill in the art; and (vii) some teaching, suggestion, or motivation in the prior that would have led one of ordinary skill to modify the prior art reference or to combine prior art reference teachings to arrive at the claimed invention.

29. A combination of references would not have been obvious if the alleged modification(s) to be made to the reference(s) would have been inconsistent with the reference’s stated goals or method of operation or would have rendered the combination inoperable for its intended purpose. I further understand that for something to have been obvious, the party asserting

obviousness must explain why a POSITA would have selected components for combination in the manner claimed.

30. I further understand that a claim is not obvious over a combination of prior art references if such references “teach away” from the claimed combination, if there is no motivation to combine such references, or if the combination would lead to waste and inefficiencies not present in one or more of the references in isolation.

31. It is my further understanding that obviousness cannot be based on a hindsight combination of components selected from prior art references. For example, the challenged patent itself cannot be used as a basis for combining prior art references absent such a teaching in the patent. I also understand that an invention would not have been obvious simply because all of the elements of the invention may have been known separately in the prior art.

32. Regarding claim construction, I understand that, in IPR proceedings, claims are construed using the *Phillips* standard, requiring a “construction that stays true to the claim language and most naturally aligns with the patent’s description of the invention. I further understand that a claim term is to be given its plain and ordinary meaning to a POSITA unless the patentee has acted as his own lexicographer and has defined such term differently.

VII. LEVEL OF ORDINARY SKILL IN THE ART

33. I understand that the hypothetical POSITA is considered to have the normal skills and knowledge of a person in a certain technical field, as of the time of the invention at issue. I understand that factors that may be considered in determining the level of ordinary skill in the art include: (1) the types of problems encountered in the art; (2) the prior art solutions to those problems; (3) rapidity with which innovations are made; (4) the sophistication of the technology; and (5) the education level of active workers in the field. I also understand that “the person of ordinary skill” is a hypothetical person who is presumed to be aware of the universe of available prior art. Therefore, no such person actually exists.

34. Petitioner has proposed that a POSITA for the '196 Patent would have had “a working knowledge of mobile payment systems and techniques pertinent to the '196 Patent. A POSITA would have had a bachelor's degree in electrical engineering, computer science, or equivalent training, and approximately two years of work experience in software development with a basic knowledge of accounting. Lack of work experience can be remedied by additional education, and vice versa.” (Pet. at 4; Ex. APPL-1003, “Houh Declaration” ¶ 22.)

35. I agree with Petitioner's characterization, provided that the two sentences quoted above are combined to yield this description: “A POSITA would have had a bachelor's degree in electrical engineering, computer science, or

equivalent training, and approximately two years of work experience in software development with a working knowledge of mobile payment systems and techniques and a basic knowledge of accounting. Lack of work experience can be remedied by additional education, and vice versa.” I believe that this description is materially the same a Petitioner’s.

36. I have had at least this level of skill since at least 2010, when I regularly began teaching about mobile payment systems.

37. The opinions I express herein are from the viewpoint of such a POSITA as of November 21, 2011, the priority date assumed by Petitioner¹. Pet. at 4.

VIII. CLAIM CONSTRUCTION

38. I understand that Petitioner believes that one claim phrase requires construction, while Patent Owner believes that three phrases, not including Petitioner’s phrase, require construction. I address Patent Owner’s phrases below.

A. “mobile device”

Claim Phrase	Patent Owner’s Construction
“mobile device” (Claims 1, 8, 16, 21, 22)	“physical device that is mobile, such as a phone or tablet”

¹ The Petition at 4 assumes a priority date of November 2011. The ’196 Patent claims priority to November 21, 2011.

39. Normally no construction of this well-understood term would be needed. However, Petitioner identifies various structures in the prior art as “mobile devices” that are clearly not mobile devices. The Petition at 33 asserts that Sender’s M-Wallet 125 and Recipient’s M-Wallet 130 are “mobile devices” meeting limitation 1.4C. However, M-Wallets 125 and 130 are not devices at all – they are software and data residing not on a mobile device, but on the mobile network operator’s platform 130.

40. It appears that Petitioner is implicitly construing “mobile device” to include any element associated with a mobile network operator, whether or not that element is mobile. Patent Owner therefore proposes to construe “mobile device” expressly to have its plain and ordinary meaning as used in the Patent, which discloses at 11:32-33 that “[t]he subscriber has (or has access to) a mobile device 206 such as a phone or tablet.”

41. Possibly Petitioner has misconstrued the next sentence of the Patent (11:34-35), “[t]he mobile device runs the native or third party mobile wallet application 207.” In Dill, Mobile Wallet Application/Service 121, which includes M-Wallets 125 and 130, runs on the Mobile Network Operator platform 120. Petitioner apparently believes that any device that runs a mobile wallet application is a “mobile device,” which is incorrect.

B. “mobile wallet application”

Claim Phrase	Patent Owner’s Construction
“mobile wallet application” (Claims 1, 8, 16, 21, 22)	“wallet application installed on a SIM card or elsewhere on a mobile device”

42. This term is expressly defined in the Patent: “[a]s used herein, a mobile wallet application is a mobile wallet application installed on a SIM card or elsewhere on a mobile device.” Ex. 1001, 7:14-16.

43. Petitioner points to Dill as using the term “mobile wallet application,” which it does. However, Petitioner points to “mobile wallet applications” in Dill that run on a mobile network operator’s platform. These are not “mobile wallet applications” as claimed in the Patent because they are not installed on a SIM card or elsewhere on a mobile device.

C. “third-party mobile wallet”

Claim Phrase	Patent Owner’s Construction
“third-party mobile wallet” (Claims 21, 22)	“mobile wallet provided by a provider other than the provider of the cloud-based transaction platform”

44. This term is expressly explained in the Patent: “[t]he mobile wallet application may either be native (i.e. provided by the provider of the cloud-based transaction platform) or third party (i.e. provided by a provider other than the provider of the cloud-based transaction platform).” Ex. 1001, 7:17-20. A

consequence of this definition is that a “third-party mobile wallet” is one not provided by the provider of the cloud-based transaction platform.

45. The Patent improved upon prior art wallet system that required all users of the system to have obtained their wallets from the same provider. Using the methods of the Patent, participants can engage in financial transaction regardless of which provider’s wallet they are using. In the Patent, third party mobile wallets are different from native mobile wallets, and the specification discloses a platform that supports both native and third party wallets.

46. Petitioner attempts at p. 31 to address this claim 21 limitation: “wherein the mobile wallet transaction comprises at least one of a mobile wallet transfer in which funds are transferred from the mobile wallet of the customer to a third party mobile wallet, a mobile wallet withdrawal in which funds are withdrawn from the third party mobile wallet and provided to the customer, or a mobile wallet deposit in which funds are deposited into the third party mobile wallet.” It asserts that Dill teaches the limitation because it discloses “a structured settlement between unrelated entities such as the sending mobile wallet 125 and receiving mobile wallet 130.” However, there is no disclosure in Dill that sender and receiver, though unrelated to each other, have wallets from different providers. Quite the opposite is shown. In Dill, all mobile participants are disclosed as having wallets from the Mobile Network Operator.

D. “debit the mobile wallet by the specified amount of funds”

47. I have not provided comments with respect to Petitioner’s constructions of “mobile wallet” and “debiting the mobile wallet” in connection with the Patent Owner Preliminary Response. I reserve the right to challenge Petitioner’s constructions of these terms should this matter be instituted, or in any other proceeding. Nothing herein should be construed as an admission or concession by me that Petitioner’s construction of these terms is correct.

IX. THE PETITION FAILS TO DEMONSTRATE A REASONABLE LIKELIHOOD OF SUCCESS

A. The Dill Disclosure Does Not Meet Petitioner’s Own Construction of “Mobile Wallet”

48. The Petition at 5-6 offers an implied construction of “mobile wallet”:

A POSITA would have understood that there are various types of mobile wallets: (1) where a mobile device holds value (such as on a secure chip) and (2) where the value is stored in an external account. The ’196 patent refers to the first type of mobile wallet.

49. The Petition also offers an express construction of “debit the mobile wallet by the specified amount of funds”:

Although not defined with more detail, the term “stored value” in mobile wallets is well-known and refers to a value stored on a mobile device (such as in a secure memory). See, e.g., APPL-1011, [0009], [0022] (“Mobile communication devices used in the architecture described herein are characterized by secure memory usable for

*storing value and a controller which manages the secure memory,”
“stored value represented by data on the mobile communication
device”). ... Accordingly, a POSITA would have understood “debit the
mobile wallet by the specified amount of funds” to include
“transferring the specified amount of funds **from the stored value on
a mobile device.**”*

50. Petitioner’s construction requires the mobile wallet to reside “on a mobile device.” Dill contains no disclosure of any mobile wallet at all on any mobile device. Instead, Petitioner identifies M-Wallets 125 and 130 as the claimed “mobile wallets.” However, a glance at Dill Figs. 1 and 9 shows that M-Wallets 125 and 130 reside on the Mobile Network Operator platform 120, not on any mobile device. The account value is clearly stored externally to the mobile device rather than on the mobile device itself.

B. The Petition Erroneously Maps Dill’s Mobile Wallet Application (121) To The Claimed “Mobile Wallet Application” Installed On A Mobile Device”

51. As explained above, the Patent defines “mobile wallet application” expressly to mean “wallet application installed on a SIM card or elsewhere on a mobile device.”

52. The Petition maps the claimed “mobile wallet application” to Dill’s “Mobile Wallet Application/Service 121.” However, as shown in Fig. 1 and 9 of Dill, the Mobile Wallet Application/Service 121 is not “installed on a SIM card

or elsewhere on a mobile device.” Therefore, Dill does not disclose any claim limitations reciting a “mobile wallet application.”

C. The Petition Fails To Demonstrate That Dill Teaches a “Third-Party Mobile Wallet,” As Recited in Claims 21 and 22

53. As explained above in the Claim Construction section, a “third-party mobile wallet” is a “mobile wallet provided by a provider other than the provider of the cloud-based transaction platform.”

54. The Petition does not address “third-party mobile wallet” directly. It says instead at p. 81:

*For example, Dill’s system is configured to provide “a structured settlement between **unrelated entities such as the sending mobile wallet 125 and receiving mobile wallet 130.**” APPL-1005, [0057]; APPL-1003, ¶354. As discussed in [1.10B], Dill also discloses various types of mobile wallet transactions, such as “mobile-to-cash,” “cash-to-mobile,” and “mobile-to-mobile” that may be facilitated between mobile wallets 125, 130. APPL-1005, [0065], Figs. 3-7. A POSITA would have understood these transactions to be a “mobile wallet transfer,” as well as a “mobile wallet withdrawal” and a “mobile wallet deposit” as recited by the claims.*

55. Dill’s reference to “unrelated entities” does not address the “third party” mobile wallet limitations in Claims 21 and 22 at all. The fact that Dill’s M-Wallets 125 and 130 may belong, respectively, to Sender 105 and Receiver 110, and the Sender and Receiver may be unrelated to one another says nothing about

the provider of the M-Wallets. In short, Petitioner does not even explain how Dill discloses the “third-party” requirement.

D. Dill's Transfer Options Module Does Not Include An Integration Tier Configured To Manage a Mobile Wallet Sessions With A Mobile Device, As Recited In All Independent Claims

56. All the independent claims recite an “integration tier configured to manage mobile wallet sessions with a mobile device,” or similar recitation. The Petition does not discuss what a “session” is, as opposed to a “transaction,” and does not show that the “integration tier,” which Petitioner maps to Dill’s Transfer Options Module 145, manages anything whatsoever on any mobile device, let alone mobile wallet sessions.

57. In the environment described in the ’196 Patent, the terms “session” and “financial transaction” would be understood quite differently from one another by a POSITA. For example, an outcome of a “session” may be that one or more “transactions” occur, a “session” is not the outcome of a “transaction.” Further, while multiple transactions can occur during a session; multiple sessions cannot occur during a transaction.

58. An example of the claimed “integration tier configured to manage mobile wallet sessions with a mobile device” is shown in Fig. 1 of the ’196 Patent, which illustrates Integration Tier 101 in communication with mobile devices such as an “Android,” “Blackberry,” or “iPhone.” The session begins when the mobile

device sends a request to Integration Tier 101, terminates when communications between the mobile device and the Integration Tier 101 end, and includes the communications between the mobile device and the Integration Tier 101, which manages the session by managing these communications with the mobile device during this time.

59. Figure 1 of the '196 Patent and the corresponding description draw a distinction between Integration Tier 101 which, inter alia, is “configured to *manage* mobile wallet sessions,” and other components such as Payment Handler 105 configured to *facilitate* transactions. Compare Ex. 1001, 9:63-64 (“Integration Tier 101 is configured to *manage* mobile wallet sessions,”) with 10:24-26 (payment handler 105 “*facilitates* interactions with many different kinds of payment processors.”) A POSITA would also understand that the mobile device connects to a mobile wireless network, and the claimed “session” with such a mobile wallet device is over a mobile wireless network.

60. In Dill, the session with the mobile device of a sender 105 is managed by Mobile Operator Network 120. See, e.g., Ex. 1005, ¶ [0077] (stating “the process begins with a *sender 105* initiating a money transfer by *sending a request* to a mobile wallet application of the *sender's mobile network operator 120...*”). To the extent there is an analogy with the '196 Patent, Dill's Money Transfer Facilitator 145 is analogous to Payment Handler 105 of the '196 Patent,

i.e., both Payment Handler 105 in the '196 Patent and Dill's Money Transfer Facilitator 145 *facilitate* transactions, as opposed to *managing sessions* with a mobile device. It is clear from Fig. 1 of the '196 Patent that Payment Handler 105, which is not part of the integration tier, does not manage any mobile wallet sessions.

61. The fact that the Mobile Network Operator 120 sends queries to, and receives responses from, Money Transfer Facilitator 145 during the mobile wallet session in no way diminishes the fact that Mobile Network Operator 120 is in charge of managing the session with the mobile device of sender 105.

62. The Petition suggests that a user might use Dill's Web interface 137 to access the Money Transfer Facilitator 140 from a mobile device. It is even conceivable that a user might visit the Money Transfer Facilitator 140 using a mobile browser. However, the mobile wallets reside with Mobile Network Operator 120 and there is no disclosure in Dill that any mobile wallets would be affected by any interaction between a mobile phone and Web interface 137. Accordingly, the interfaces 136-138 do not connect to the sender device 105 that is erroneously alleged to run the mobile application 121 (the mobile application 121 is in fact run by the Mobile Network Operator 120). Instead, the only way that Money Transfer Facilitator 140 could affect the mobile wallets would be to ask the Agent 135 to ask the Mobile Network Operator 120 to modify the wallets.

Even in such a case, Transfer Options Module 145 would not be managing any “mobile wallet session,” as such a session would take place between the Sender 105 and the Mobile Network Operator 120.

X. CONCLUSIONS

63. Relying on my education, experience, skill, and training in the relevant field of art, and after reviewing the materials identified above, it is my opinion that:

- Patent Owner’s proposed constructions correspond to the plain and ordinary meanings of the terms construed.
- Petitioner has not demonstrated a reasonable likelihood of success on its sole ground for the Petition.

64. I hereby declare that all statements made herein of my knowledge are true, and that all statements made on information and belief are believed to be true, and 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.

65. I reserve the right to supplement my opinions in the future to respond to any arguments that Petitioner raises and to take into account new information as it becomes available to me.

66. In signing this Declaration, I understand 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 acknowledge 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 remotely within the United States during the time allotted for cross examination.

Executed April 11, 2023 at Pittsburgh, Pennsylvania.


Michael I. Shamos, Ph.D.