

UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE PATENT TRIAL AND APPEAL BOARD

CSC SERVICEWORKS, INC.,
Petitioner,

v.

PAYRANGE INC.,
Patent Owner.

Case No. IPR2023-01186
Patent No. 8,856,045

DECLARATION OF MICHAEL I. SHAMOS, PH.D., J.D.

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I, Dr. Michael I. Shamos, declare as follows:

I. INTRODUCTION AND QUALIFICATIONS

1. I have been retained by counsel for Patent Owner PayRange, Inc. (“PayRange”) to provide technical analysis and opinions relating to CSC ServiceWorks, Inc.’s (“Petitioner’s”) Petition for inter partes review challenging the validity of all claims (1-26, the “Challenged Claims”) of U.S. Patent No. 8,856,045 (“the ’045 Patent” or “the Patent,” EX1001).

2. 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 was 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.

3. 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.

4. I have taught graduate courses at Carnegie Mellon in Electronic Commerce, including eCommerce Technology, Electronic Payment Systems, Electronic Voting, Internet of Things, 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, which is required by three graduate programs. I currently also teach Artificial Intelligence and Future Markets. From 2001-2021, I was a Visiting Professor at the University of Hong Kong, where I taught an annual graduate course in Electronic Payment Systems.

5. My professional experience extends to wireless payment systems involving unattended retail machines such as vending machines. For example, I have worked with students in developing a kiosk for providing replacement keys (such as a house key) upon customer authentication via credit card. Other examples include development of an automated store checkout system and an unmanned medication dispensing machine.

6. I am the author and lecturer in a 24-hour video course on Internet protocols and taught computer networking, wireless communication, and Internet architecture from 1999-2018.

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

8. I am a named co-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 9,456,299.

9. 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.

10. I have previously served as an expert in over 370 cases concerning computer technology. In particular, I have been involved in multiple cases involving electronic payment systems.

11. I am being compensated at the rate of \$625 per hour for my work. I have no financial interest in any of the parties or in the outcome of this matter.

12. A summary of my education, experience, awards and honors, patents, publications, and presentations is provided in my CV, a copy of which is submitted separately. EX2019.

13. The statements made and opinions provided in this Declaration are based on my own personal knowledge and experience.

14. In this declaration, all emphasis has been added unless otherwise noted.

II. SCOPE OF WORK

15. I understand that Petitioner alleges the following Grounds of invalidity:

Grd.	Sec.	References	Challenged Claims
1	102, 103	Low	1, 18
2	103	Low in view of Skowronek	2-3, 19-20
3	103	Low in view of Freeny	4-6, 21-23
4	103	Low in view of Skowronek and Freeny	10-14
5	103	Low in view of Wilson	8-9, 25-26
6	103	Low in view of Freeny and Wilson	7, 24
7	103	Low in view of Skowronek, Wilson, and Freeny	15-17

16. I have been asked to provide my expert technical opinions regarding Petitioners' assertions that the references they assert as prior art anticipate or render obvious the Challenged Claims, as those assertions appear in the Petition and/or Neuman Declaration.

17. In connection with my analysis, I have reviewed the '045 Patent, the Petition, and the Declaration of Dr. Neuman (EX1003). I have also reviewed and considered various other documents in arriving at my opinions, and cite them in

this declaration. For convenience, documents cited in this declaration are listed in the Appendix in Section XVI.

18. 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 Petitioners.

III. LEGAL PRINCIPLES

19. I have not been asked to provide, nor will I provide, in this declaration, any opinions on the law. Counsel for Patent Owner has informed me of the legal principles that apply in this proceeding.

20. The burden of proving every proposition of unpatentability in this proceeding rests on the Petitioner and must be proven by a preponderance of the evidence. This burden of proof applies to each factual matter in each Ground raised in the Petition, including specific arguments raised by the Petitioners regarding patent eligibility, enablement, indefiniteness, anticipation, and obviousness.

21. I am informed that the post-AIA text of 35 U.S.C. §§ 102 and 103 are applicable in this proceeding. A claim is unpatentable as anticipated if each and every element of the claim is described, either expressly or inherently, in a single prior art reference in the same configuration in which those elements are claimed. To establish anticipation by inherency, the inherent teaching must necessarily

result from what is described in the prior art reference. The mere probability or possibility that a certain thing may result from a given set of circumstances is not sufficient to demonstrate inherency.

22. A claimed invention is unpatentable for obviousness 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 the person of ordinary skill in the art, in view of the prior art. The U.S. Supreme Court set out the framework for the obviousness inquiry as follows:

The scope and content of the prior art are to be determined; differences between the prior art and the claims at issue are to be ascertained; and the level of ordinary skill in the pertinent art resolved. Against this background, the obviousness or nonobviousness of the subject matter is determined. Such secondary considerations as commercial success, long felt but unsolved needs, failure of others, etc., might be utilized to give light to the circumstances surrounding the origin of the subject matter sought to be patented.

23. Secondary considerations of non-obviousness are sometimes referred to as objective indicia of non-obviousness, and these must be considered in every case in which they are present.

24. I understand that the steps of a method claim may be performed in any order unless a particular order is expressed or implied by the claim, or is determined by physical or logical constraints.

IV. SUMMARY OF THE '045 PATENT

25. The '045 patent is entitled “Mobile-Device-to-Machine Payment Systems.” EX1001, cover. The Abstract of the '045 patent states that the patent describes “a mobile-device-to-machine payment system and method for facilitating a cashless transaction for purchase of at least one product or service by a user from a payment accepting unit.” EX1001, Abstract. The communication between the mobile device and the payment accepting unit (e.g., a vending machine) is short-range, as the user must be relatively close to the machine to engage in a transaction. The second communication capability can be long-range, e.g., cellular communication, as the authorization server could be anywhere in the world. In the “Background of the Invention” section, the specification of the '045 Patent states: “Disclosed herein are mobile-device-to-machine payment systems and, more specifically, mobile-device-to-machine payment systems over a non-persistent network connection and featuring hands-free and manual modes.” EX1001, 1:14-17.

26. In the conventional operation of a vending machine, a user either inserts cash into a slot or physically inserts, or possibly taps, a credit card to a

reader on the machine. The user then selects goods to be purchased. In the cash scenario, the goods will be dispensed if sufficient cash has been inserted to cover the cost of the goods. In the credit card scenario, once the user selects the goods to be purchased, the machine uses information from the user's credit card to obtain an authorization through a payment network (e.g., VisaNet) to charge the card for the amount of the purchase. The authorization is obtained after the goods have been selected and a definitive purchase amount has been determined.

27. The '045 Patent is not concerned with either of these scenarios. In the '045 Patent, the user possesses a wireless device, such as a smartphone. Unlike traditional online purchases, the user does not select any goods using the device before requesting authorization for funds. EX1001, 31:47-60. When the device comes within a certain distance of the machine, the machine sends an authorization request for funds to the user's mobile device using short-range communications technology. *Id.*, 4:53-67, 31:54-57, claim 1. The device then, using long-range communications technology, forwards the authorization request for funds to a server. *Id.*, 4:67-5:5, claim 1. The server generates and transmits an authorization grant for funds to the user's mobile device, which ultimately passes it on to the machine. *Id.*, 5:6-16, 14:66-15:46, 31:57-60, claim 1. All of this takes place before any goods have been selected, and it may even take place before the user has even had an opportunity to choose any goods. *Id.*, 5:16-20, 31:54-57, claim 1.

The authorization grant for funds informs the machine that it may dispense goods up to a particular dollar amount, and payment may be made for any goods whose total does not exceed that amount. *Id.*, 5:61-67, 10:62-11:1, 11:17-32, 20:41-46, 31:54-62. The Patent describes this as “preemptively” authorizing funds, that is, authorizing before any goods have been selected and before any transaction amount is known. *Id.*, 31:54-57.

28. This approach provides several technological advantages. For example, this solution provides a mechanism for, with minimal user interaction with the mobile device, preemptively obtaining authorization for funds that can be spent on subsequent cashless transactions at payment accepting units lacking a persistent network connection to a remote server. EX1001, 10:1-37, 13:14-18, 30:43-31:7. It also allows the user to make multiple purchases (provided that the purchase totals do not exceed the authorized funds) based on a single authorization for funds. *Id.*, 9:36-41, 11:17-32, 21:32-64, 29:61-30:2 (discussing “multi-vend” capability), Figs. 8D, 9E.

29. The '045 Patent also solves another technological problem that arises in the context of its mobile-device-to-machine payment system. That is, once the authorization credential is sent to the machine, the machine may dispense goods to anyone who selects them. If the machine is located in a publicly accessible place, multiple people may be in its vicinity, and any one of them, not necessarily the

person who obtained the authorization, might obtain goods. However, the user who obtained the authorization would be charged for goods they did not receive. One way that the Patent solves the problem is by establishing a pair of signaling zones, an “authorization zone” and a “payment zone,” the latter being a subset of the former. *Id.*, 4:22-32, 5:45-57, 21:32-23:25, Fig. 1, claims 4-5. When the device is within the authorization zone of the machine, the device obtains an authorization. *Id.* However, to prevent an unauthorized user from making use of an authorization that is not their own (and thus obtain goods that the authorized user would pay for), the device does not send the authorization to the machine until the user has moved closer to the machine, i.e., into the payment zone. *Id.* The payment zone is restricted to ensure that the only person close enough to the machine to cause it to dispense goods is the user who obtained and sent the authorization. *See, e.g., id.*, 27:6-40, 29:22-36.

30. The '045 Patent contains 26 claims, all of which are challenged. Claims 1, 10, and 18 are independent. For reference, I have reproduced claim 1 below. The identifying labels in brackets correspond to those in the Petition, and the limitations have been paraphrased.

1.[pre] A mobile-device-to-machine payment system for facilitating a cashless transaction for purchase of at least one product or service by a user from a payment accepting unit having input mechanisms,:

[pre(i)] the user having a mobile device having both short-range communication technology and long-range communication technology,

[pre(ii)] the payment accepting unit capable of dispensing at least one product or service, said system comprising:

(a) an adapter module associated with the payment accepting unit, said adapter having short-range communication technology for communicating with the short-range communication technology of the mobile device;

(b) a server having long-range communication technology for communicating with the long-range communication technology of the mobile device;

(c) said adapter module for sending an authorization request for funds to the mobile device using short-range communication technology, the mobile device forwarding said authorization request for funds to said server using long-range communication technology; and

(d) said server for sending an authorization grant for funds to the mobile device using long-range communication technology, the mobile device forwarding said authorization grant for funds to said adapter module using short-range communication technology;

(e) wherein the payment accepting unit dispenses the at least one product or service in response to receiving user input to the payment

accepting unit input mechanism if said adapter module has received said authorization grant.

31. Claims 1-9 depend directly from claim 1. Claim 2 further recites that the adapter module and server have security technology and said server having security technology, the authorization request is secured by the adapter module security technology, the authorization grant being secured by the server security technology, and the secured authorization request and secured authorization grant are undecipherable to the mobile device.

32. Claim 3 recites that the adapter module and server share a unique private key, the adapter module and server have encryption/decryption technology, the authorization request is encrypted by the encryption/decryption technology using the key, the authorization grant is encrypted by the encryption/decryption technology using the key, the authorization grant is decrypted by the adapter module using the key, and the authorization request and authorization grant are undecipherable to the mobile device.

33. Claim 4 recites that the adapter module is surrounded by a payment zone and an authorization zone, the adapter module sends the authorization request when the mobile device is in the authorization zone, and the mobile device forwards the authorization grant when the mobile device is in the payment zone.

34. Claim 5 recites that the adapter module is surrounded by a payment zone, an authorization zone, and a communication zone, the payment zone is in the authorization zone and the authorization zone is in the communication zone, the mobile device receives advertising from the adapter module within the communication zone, the adapter module sends the authorization request when the mobile device is in the authorization zone, and the mobile device forwards the authorization grant to the adapter module when the mobile device is in the payment zone.

35. Claims 6 recites that the system of claim 1 has a hands-free mode in which the payment accepting unit dispenses a product or service without the user interacting with the mobile device.

36. Claim 7 recites that the system of claim 1 has a hands-free mode in which the payment accepting unit dispenses a product or service without the user interacting with the mobile device. the payment accepting unit displays funds available based on the authorization grant and the payment accepting unit allows the user to select a product or service to be dispensed.

37. Claim 8 recites that the adapter module is an in-line dongle within a multi-drop bus of the payment accepting unit.

38. Claim 9 recites that, in the system of claim 1, the payment accepting unit has a multi-drop bus to a payment receiving mechanism, the multi-drop bus

has male and female adapters, the adapter unit has male and female adapters, and the adapter module is insertable in serial with the multi-drop bus by connecting the male adapter of the adapter module to the female adapter of the multi-drop bus and by connecting the female adapter of the adapter module to the male adapter of the multi-drop bus.

39. Independent claim 10 is effectively an amalgam of claims 1 and 5 and portions of claim 2.

40. Claim 11 depends from claim 10 and adds that the authorization grant is undecipherable to the mobile device.

41. Claim 12 depends from claim 10 and adds the limitations of claim 3.

42. Claim 13 depends from claim 10 and is parallel to claim 5.

43. Claim 14 depends from claim 10 and is parallel to claim 6.

44. Claim 15 depends from claim 10 and is parallel to claim 7.

45. Claim 16 depends from claim 10 and is parallel to claim 8.

46. Claim 17 depends from claim 10 and is parallel to claim 9.

47. Independent claim 18 is effectively a method form of claim 10.

48. Claim 19 depends from claim 18 and adds limitations from claim 12.

49. Claim 20 depends from claim 18 and adds other limitations from claim 12.

50. Claim 21 depends from claim 18 and is parallel to claim 4.

51. Claim 22 depends from claim 18 and is parallel to claim 5.

52. Claim 23 depends from claim 18 and is parallel to claim 6.

53. Claim 24 depends from claim 18 and is parallel to claim 7.

54. Claim 25 depends from claim 18 and is parallel to claim 8.

55. Claim 26 depends from claim 18 and is parallel to claim 9.

V. LEVEL OF ORDINARY SKILL AND RELEVANT TIME

56. I have been advised that “a person of ordinary skill in the relevant field” (“POSITA”) is a hypothetical person who is presumed to be familiar with all relevant art at the time of the invention, and to whom one could assign a routine task with reasonable confidence that the task would be successfully carried out. According to the Petition, the relevant timeframe is December 2013. See Pet., 11.

57. Petitioners in this case assert that a “person having ordinary skill in the art would have had “a bachelor’s degree in electrical engineering, computer engineering, computer science, or equivalent training, and approximately three years of experience with electronic payment systems, vending machine technologies, or distributed network systems. Additional education can substitute for less work experience, and vice versa.” Pet., 11.

58. The Neuman Declaration propounds the same characterization at ¶19, but provides no basis for it.

59. I understand that the specification and the claims inform the required level of skill.

60. The background section of the '045 Patent (1:14-17) states:

Disclosed herein are mobile-device-to-machine payment systems and, more specifically, mobile-device-to-machine payment systems over a non-persistent network connection and featuring hands-free and manual modes.

61. Therefore, a POSITA would need to be familiar with mobile network communications and electronic payment systems.

62. The claims are drawn to mobile-to-machine communication, both short-range and long-range and networked client-server communication, including data encryption and decryption. In 2013, mobile-to-machine communication and data encryption/decryption were standard components of the undergraduate curriculum in the fields of computer science and electrical engineering. However, electronic payment systems require familiarity with the operation of payment networks.

63. Accordingly, in my opinion, a person of ordinary skill in the relevant field prior to December 2013 would have, through education or practical experience, the equivalent of a Bachelor of Science in Electrical Engineering, Computer Science, or a related/equivalent field and, in addition, one year of work

experience in wireless communication, vending machine technology, and electronic payment systems. Additional applicable education can substitute for less work experience, and vice versa.

64. I do not believe that any differences between my characterization and that of Dr. Neuman are material to the issues with Grounds 1-7 that I discuss in this declaration, and I have been asked to apply Petitioner's characterization for purposes of this proceeding even though I do not entirely agree with Dr. Neuman's characterization. In 2013, my education and professional experience satisfied both my own POSITA characterization as well as the one set forth in Dr. Neuman's declaration.

VI. CLAIM CONSTRUCTION

65. I have been advised that, absent some reason to the contrary, the '045 Patent claims are given their ordinary and customary meaning as would be understood by a POSITA in view of the intrinsic evidence. If the inventor has acted as his own lexicographer (as is the case here), then I understand that the definitions in the Patent are controlling. I further understand that the terminology used in the specification and the claims need not be the same. I have followed these principles in my analysis throughout this Declaration.

66. In the Institution Decision, the Board did not find that any claim construction was necessary. However, I see that Petitioner has interpreted the

claims in a way that contradict the express definitions given in the Patent, so I believe the defined terms require discussion. The definitions appear in EX1001 in a section labeled “DEFINITIONS” that extends from 11:49-18:43.

A. “an authorization request for funds”

67. This term is defined expressly at 14:53-65 of EX1001 as follows:

Authorization Request (AuthRequest): When a user enters the authorization zone 104, the mobile device 150 notifies the adapter module 100 and the adapter module 100 sends the secured authorization request (e.g. the encrypted authorization request) as a “message” (also referred to as a communication or transmissions) to the server 130 via the mobile device 150. Encryption may be performed by a security unit 755 (security technology that may be associated with the processing unit 750 and/or the memory 760). **Significantly, the AuthRequest is a request for authorization of funds, not a request for authorization of a transaction.** The purpose of the funds is irrelevant to the server 30.

68. The inventor acted as its own lexicographer by providing a definition that expressly distinguishes between an authorization request for funds (the purposes of which is irrelevant to the server) and a request to authorize a transaction.

69. This distinction is supported by the rest of the specification. For example, the specification expressly distinguishes the disclosed systems from

known systems in which the user contacts the server to obtain authorization to “make a specific purchase.” The specification expressly distinguishes the disclosed systems from known systems in which the user contacts the server to obtain authorization to “make a specific purchase”:

The mobile-device-to-machine payment systems described herein take a completely different approach. The mobile-device-to-machine payment systems described herein are not specifically interested in the details of the transaction to authorize the transaction. Instead, the mobile-device-to-machine payment systems function more like a gift card, a credit card, or a debit card in that **they allow the user to have funds to make a purchase.** When a user is in range, the adapter module 100 (via a mobile device 150) **sends an AuthRequest to the server 130 to preemptively obtain authorization to make funds available.** The server 130 returns the AuthGrant for funds to the adapter module 100 (via a mobile device 150) so that the user may use the funds to make a purchase. The AuthGrant may remain valid until it expires. This gives the user significantly more flexibility than known systems and methods.

EX1001, 31:47-62. The specification contrasts the approach of the “systems described herein” with the transaction flow described in Low, in which the user sends the server a purchase request for a particular product (“authorization request for a transaction”). Further, all the disclosed embodiments are consistent with the definition given in the Patent. In the description of Figs. 8B and 9A, the user sends

the server an authorization request for funds, not a purchase request for a particular product or service. At that point, the user has not yet selected a product, so the amount of the potential transaction is not yet known. EX1001, 28:52-29:13. The transaction itself does not take place until the user reaches the machine and selects a product or service. EX1001, 29:14-60, Figs. 8D, 9C-D.

70. Accordingly, a POSITA reading the claims in the light of the specification would have understood that the recited “authorization request for funds” as defined in the Patent is “not a request for authorization of a transaction.” EX1001, 14:53-65. However, in its analysis, Petitioner treats the “authorization request for funds” as encompassing a request for authorization of a transaction, which the definition expressly forbids.

VII. GROUND 1 (Low, Claims 1, 18)

71. Ground 1 fails for at least two reasons.

A. Petitioner does not show that Low discloses the recited “authorization request for funds”

72. All Grounds fail for both anticipation and obviousness for the fundamental reason that Low does not disclose an “authorization request for funds,” and Low is relied on in all Grounds for that limitation.

73. Low’s purchase request is a request for authorization of a transaction, not an authorization request for funds as defined in the ’045 patent and as discussed above beginning at ¶67. The user selects a product, then sends a

purchase request for the selected product. EX1001, 2:38-46 (purchase request sent after user “select[s] one or more items for purchase”), 9:24-31 (purchase request received after user selects “product for purchase,” and purchase request may “designate a product”). It is clear that Low’s purchase request is a request for authorization of a transaction because the group of servers Petitioner identifies as the recited “server” uses the request to authorize the specific transaction the user has requested. EX1004, 9:24-33 (payment provider server receives purchase request and executes “transaction processing application” to approve purchase request). This is exactly what the Patent says an “authorization request for funds” is *not*, namely, a request for authorization of a *transaction*.

74. Dr. Neuman argued at his deposition that Low’s payment provider server authorizes a transaction for funds, not the purchase of the product itself. EX2017, 80:25-83:24 (“What I am referring to is the authorization for the payment transaction versus ... other parts of transactions that are being authorized beyond solely the flow of the funds.”), 83:25-85:19 (“But the authorization that is provided in Low by the payment provider server is for the funds.”). However, Low does not distinguish between a request to authorize the purchase of the selected product and a request to authorize funds. Low simply describes a single purchase request that is used to authorize the purchase of the selected product. EX1004, 9:24-38, 10:18-61, Figs. 2-3.

75. Low further makes clear that the payment provider server is not merely authorizing funds in general, but rather specifically authorizing payment for the particular amount of the requested purchase of the selected product or service. EX1004, 9:24-38 (payment provider server executes “transaction processing application” to “approve the purchase request after review”), 9:39-58 (approval of purchase request may include “product name, product price, product code, a machine identifier, and/or a transaction number”). Petitioner’s theory includes both the payment provider server and the vendor server as the claimed “server,” and Petitioner does not argue that what it characterizes as Low’s “server” (i.e., both the payment provider server and the vendor server) is not authorizing the requested transaction because it plainly does so. Low makes clear that the purchase request itself is a request to authorize a transaction for a selected product, not an authorization request for funds as defined by the ’045 Patent.

76. Therefore, the purchase request relied upon by Petitioner in Low as the “authorization request for funds” is precisely the type of transaction request excluded in the ’045 Patent’s definition.

B. Petitioner does not show that Low discloses the recited dispensing “in response to receiving user input ... if said adapter module has received said authorization grant”

77. As previously explained, Low’s process is fundamentally different from that described in the ’045 Patent and recited in the Challenged Claims. In the

'045 Patent, the user requests authorization of funds (not a transaction) even before selecting a product or service from the payment accepting unit, and the eventual selection of a product or service then triggers dispensing (i.e., dispenses “in response to” receiving user input) if sufficient funds for the purchase were actually authorized (i.e., if the adapter module “has received” the authorization grant for funds). *See, e.g.*, EX1001, 4:53-5:20, Figs. 7, 8A-D. Low, however, describes a traditional purchase flow: the user first selects the product and sends a purchase request to authorize the transaction, and then the machine dispenses the product in response to receiving authorization of funds. EX1004, 2:29-62, 9:24-61, 10:18-61, 11:56-12:25, Figs. 2-3. However, prior art systems such as Low’s are expressly distinguished in the ’045 patent, which explains that the mobile-device-to-machine payment systems of the invention “function more like a gift card, a credit card, or a debit card in that they allow the user to have funds to make a purchase.” EX1001, 31:8-62. A POSITA reading the claims in light of the specification (in particular, the definition of “authorization request for funds”) would not have viewed Low’s traditional process as conforming to any Challenged Claim.

78. At deposition, Dr. Neuman’s was asked to explain his understanding of what “in response to” means in the context of the Challenged Claims. He testified that it requires a “causal relationship” between the receiving of the user input and the dispensing. EX2017, 116:17-117:20; see also *id.*, 115:16-118:5

("[T]here needs to be sort of that causality in some sense."), 119:14-23. This, he explained, is what supposedly makes Low's dispensing something that happens "in response to" Low's user input, even though the user input is far removed from the ultimate dispensing:

So I press a button, process goes on. We send the payment request. We get the payment authorization. Continued processing goes on that says, "okay, the process authorization has occurred, now I perform an action," that action was in response to what set the whole process in motion: the pressing of the button.

Id., 116:25-118:5.

79. When pressed further, Dr. Neuman reversed course and offered a contradictory explanation, saying that he does not think Low's dispensing occurs "in response to" other steps having the same causal relationship, including steps that are more proximate to the dispensing step such as the sending or receiving of the purchase request. *Id.*, 122:15-123:24, 126:8-128:5. He said that "a lot of things can go wrong between" sending the purchase request and dispensing the item (*id.*, 122:15-21, 128:6-18), but this reasoning contradicts his previous explanation why Low's dispensing supposedly occurs "in response to" receiving the user's selection of the product at the vending machine's interface. In other words, in Low even more things can go wrong between receiving the user input and the eventual dispensing (compared to the sending/receiving of the purchase

request), because the user's selection of the product at the vending machine's interface occurs *before* the purchase request is sent.

VIII. GROUND 2 (Low + Skowronek, Claims 2-3, 19-20)

80. This Ground fails at the outset because Low does not render parent claims 1 or 18 obvious. However, Ground 2 also fails for these additional reasons:

A. Petitioner advances inconsistent arguments that “said authorization grant” is secured/encrypted by technology of “said server”

81. Petitioner provides inconsistent mappings in Grounds 1 and 2 and mischaracterizes its own previous analysis when addressing the further requirement that the authorization grant be secured/encrypted by technology of “said server” in Ground 2. Petitioner therefore has not shown that claims 2-3 and 19-20 as a whole would have been obvious.

82. In mapping the sending of the authorization grant by the server in independent claims 1 and 18, Ground 1 relies on the payment authorization sent by Low's payment provider server. For limitation 1(d), Petitioner argues that “Low discloses that the payment provider server 140 (part of said ‘server’) executes a transaction processing application to review and approve the purchase request” and that “[t]he transaction processing application 142 then communicates a payment authorization (‘authorization grant for funds’) to the user device.” Pet. 26 (citing 9:24-62, 10:41-61); see also *id.*, 25 (arguing that the authorization request is

transmitted to payment provider server 140), 30 (relying on its discussion of element 1(d) for element 18(e)). Thus, as the Board recognized in the Institution Decision, Petitioner “only points to Low’s payment provider server 140 as meeting the claimed receiving of an authorization request for funds and sending of an authorization grant, required by claim 1.” Paper 13, 16; see also *id.*, 17 (“In any event, as Patent Owner acknowledges, Petitioner relies upon only Low’s payment provider server 140 as meeting the claimed server receiving an authorization request for funds and sending an authorization grant, required by claim 1.”). Ground 1 thus relies on the payment authorization as the alleged “authorization grant” and relies on the payment provider server as the “server” receiving the authorization request and sending the authorization to the mobile device.

83. In Ground 2, Petitioner changes horses and relies on a different message and a different server for the further requirements of the same “authorization grant” and “said server” in claims 2-3 and 19-20. Petitioner abandons the payment authorization sent by Low’s payment provider server and now relies on a different message sent by Low’s vendor server. Discussing “said authorization grant being secured by said server security technology” as recited in elements 2.ii and 19.ii, Petitioner now argues that it is Low’s vendor server that encrypts the payment authorization. However, the quote allegedly supporting that assertion refers to a different authorization message encrypted by the vendor

server, not the payment authorization message relied on in Ground 1. Pet., 41 (quoting EX1004, 10:62-11:8); see also Pet., 45 (citing element 2.ii for analogous element 19.i).

84. Petitioner's additional string citations only further underline the inconsistency. See Pet., 41 (citing EX1004, 8:3-21, 9:39-62, 12:9-19, claims 1, 7, 12). The cited passage at 8:3-21 mirrors the quoted passage, and claims 1, 7, and 12 refer to encrypting "executable code for dispensing" a selected item, not payment authorization. EX1004, 8:3-21, claims 1, 7, 12. While the cited passages from columns 9 and 12 mention payment authorization, they refer to a payment authorization message sent by vendor server 50, not the payment authorization message sent by the payment provider server as in Ground 1. EX1004, 9:39-62, 12:9-19. The cited passages describe that the vendor server receives the payment provider server's approval (directly from the payment provider server or indirectly via the mobile device) and transmits its own payment authorization to the user device. EX1004, 9:49-55 ("However, in other embodiments, vendor server 150 may first receive the approval and authorize the payment verification included in the approval by transmitting a payment authorization to user device 110."); 12:9-19 (user device transmits payment provider server's approval to vendor server, which "may then authorize the approval and return a payment authorization

message to user device 410 including a dispense process for vending machine 420”).

85. A POSITA would not have viewed Low’s payment provider servers 140 and vendor server 150 as part of the same server. While a given server may have various submodules performing different functions, Low is clear that payment provider server and the vendor server are completely distinct servers, not two components of single server. For example, Low describes the two servers as being operated by distinct companies. Compare EX1004, 6:32-41 (payment provider server 140), with *id.*, 7:51-62 (vendor server 150).

B. Petitioner does not provide a sound basis for modifying Low as proposed

86. Petitioner argues that a POSITA, in view of Skowronek’s teachings, would have had reason to modify Low to encrypt Low’s purchase request, expand the encryption methods used, and render encrypted information undecipherable to the mobile device. As I explain below, however, Petitioner’s argument has multiple flaws.

87. First, Petitioner’s proposal to render Low’s purchase request undecipherable to the mobile device fails to contend with Low’s teaching that the very same purchase request is displayed on the mobile device so that the user can approve the transaction. As described in Low, after the machine “transmits a

purchase request, such as a product name, product price, product code, a machine identifier, and/or a transaction number back to the user device,” the “user device displays the purchase request and, if the information is correct, the user selects a payment button or option on the user device, which communicates the payment request to a payment provider.” EX1004, 2:43-49. I understand that Dr. Neuman testified that Low displays this information on the user’s device because “I want to know what I’m being charged for and make sure that it is consistent with what I requested” in order to prevent users from being charged for purchases they did not request. EX2017, 75:9-23. I agree that this is the purpose of Low’s displaying of the purchase request on the user’s device. Moreover, a POSITA would have recognized that the proposed modification of Low to prevent the user’s device from deciphering the purchase request would contravene this principle of operation in Low. In other words, the proposed modification of Low to make the purchase request undecipherable to the user’s device would prevent the user’s device from displaying the purchase request so that the user can approve it.

88. Second, Petitioner appears to misread the teachings of Skowronek that form the basis of Petitioner’s proposal to modify Low. As I noted above, Petitioner proposes modifying Low to use Skowronek’s encryption techniques such that Low’s vending machine encrypts the purchase request to make it undecipherable to the user’s device. The stated reasons for making this

combination rely on ¶¶26-27 of Skowronek. Pet., 35-38. In particular, Petitioner argues that Low’s purchase requests “contain the same type of **transaction and payment information that Skowronek encrypts**” and that a POSITA therefore “would have naturally been motivated to apply Skowronek’s teachings of encrypting the same such information to Low.” Pet., 37 (citing, *inter alia*, EX1005, ¶¶26-27).

89. However, ¶¶26-27 of Skowronek do not describe the retail machine as encrypting transaction information or payment information to make such information undecipherable to the user’s device. The retail machine compiles the transaction information “into a packet of information” that can then be encrypted “for transmission” before being “presented to the consumer on the mobile appliance 104 for approval.” EX1005, ¶¶26-27. As I explained above with respect to Low’s display of the purchase request, presenting transaction information to the user for approval of course means that the message sent by the retail machine cannot be undecipherable to the user’s device. Further, ¶¶26-27 of Skowronek do not describe the retail machine even having the payment information, let alone encrypting it. Rather, “[t]he mobile appliance 104”—i.e., the *user’s device*—“compiles and appends the payment information to the transaction information received from the unattended retail device 102,” at which point the user’s device

may encrypt the combined information before sending it to the merchant processor.

Id.

IX. GROUND 3 (Low + Freeny, Claims 4-6, 21-23)

90. This Ground fails at the outset because Low does not render parent claims 1 or 18 obvious. However, Ground 3 also fails for these additional reasons:

A. Petitioner does not provide a sound reason to combine the references as proposed

91. Petitioner’s motivation argument fails for several reasons. The proposed combination of Low and Freeny relies on making Low’s transaction process more convenient by “reduc[ing] the number of interactions the user must have with the user device to complete the transaction.” Pet., 48. However, Petitioner does not show that applying Freeny’s teachings would have reduced the number of user-device interactions.

92. Dr. Neuman testified at deposition that the “big advantage” was realized for machines dispensing predetermined services such as a toll booth, in which “there’s not a selection of the product itself.” EX2017, 188:24-189:16. But Dr. Neuman also testified that Petitioner is not relying on those types of machines. *Id.*, 66:17-67:19; see also Pet., 27-28 (relying on selection of product via input mechanism on Low’s vending machine). Petitioner does not argue that the alleged “big advantage” for predetermined-service machines would apply to the type of machines relied on in the proposed combination—i.e., machines in which a

product is selected by the user at the machine's interface—let alone explain how or why it would apply.

93. Dr. Neuman then proposed a new “fraud” rationale, arguing that automatically sending the purchase request when the mobile device detects that the user is standing next to the machine would prevent others from posing as the user and fraudulently obtaining products. EX2017, 189:17-195:10 (machine can “assume that you are approving the transaction”). That new anti-fraud theory is not in the Petition, it is also divorced from the proposed modification, which involves implementing two proximity triggers: one to trigger sending a purchase request upon arrival at the first proximity distance, and a second to trigger forwarding payment authorization to the vending machine upon arrival at a second proximity distance within the first proximity distance. Pet., 50-51. Neither the petition nor Dr. Neuman identify any reason for a POSA to make the combination actually proposed in the petition in order to prevent fraud.

94. The rationale further fails because it misapprehends of Low's location-based determinations. Citing Low's claims 1, 7, and 12, Petitioner argues that a POSITA examining Low would have looked to Freeny's teaching of proximity-based transactions because “Low already discloses that machines are identified based on the proximity of the user device.” Pet., 49-50. In other words, Low's user device can supposedly “track the proximity between” the user device

and the vending machine such that a POSITA could have set up Freeny's first/second proximity distances "[u]sing this capability." *Id.*, 50. This reasoning is incorrect. Low does not teach that the user device tracks this proximity; rather, the user device sends its location to the payment provider server so that the *server* can determine which machines are nearby. EX1004, 9:4-23, claims 1, 7, 12.

95. Furthermore, the proposed combination is illogical and is based on a misreading of Low. Petitioner asserts that Freeny discloses proximity-triggered transmission of an authorization request at a first distance and proximity-triggered payment at a second distance. *Pet.*, 48-50; 63. It does not. Petitioner then proposes modifying Low to use Freeny's non-existent purported techniques so that Low's vending machine would send the purchase request (the alleged "authorization request for funds") to the mobile device automatically at the first proximity distance, and the mobile device would automatically forward the payment authorization (the alleged "authorization grant for funds") to the vending machine at the second proximity distance. *Id.*, 51-52 (proposing to modify Low "to trigger authorization and payment upon arrival at certain proximities to the non-Internet connected machines"). This argument is fundamentally flawed in at least two ways.

96. First, Petitioner misreads Freeny. The cited portion of Freeny does not disclose that its retail machine sends the mobile device an authorization request

at the first proximity distance, as Petitioner argues. Quite the opposite – the mobile device sends an authorization code *to* the retail machine. EX1006, 33:23-27. Further, Freeny does not teach forwarding an authorization grant from the mobile device to a retail machine at the second proximity distance. Instead, Freeny’s store checkout system just approves the transaction at the second proximity distance. *Id.*, 33:31-36.

97. Second, the proposed modification is plainly illogical. Petitioner proposes that Low’s purchase request would be sent automatically “upon arrival” at the first proximity distance from the vending machine, but this purchase request must be for a product *selected at the vending machine*. Pet., 27-28 (arguing product selected via input mechanism on vending machine), 51 (arguing Low, as modified, would “trigger authorization and payment upon arrival at certain proximities”); *see also* EX2017, 188:24-189:16 (Dr. Neuman confirming that Ground 3 maintains reliance on product selection via input mechanism on vending machine). But with the user only selecting the product for purchase at the vending machine’s interface, per Petitioner’s proposal, the user would not yet have made any selection “upon arrival” at the first proximity distance. In other words, Petitioner effectively proposes automatically sending a purchase request before the user has selected the product to be purchased, which makes no sense.

B. Petitioner does not show that the references teach the claimed

transmissions in the authorization and payment zones

98. For first proximity distance, Petitioner has the limitation backwards. In the store checkout embodiment Petitioner relies on, Freeny does not teach sending an authorization request from a mobile device to a server when the mobile device reaches the first proximity distance, as Petitioner argues. Instead, on reaching the first proximity distance the mobile device sends an authorization code to the store checkout system (i.e., the proximity service unit). EX1006, 33:23-27 (proximity authorization unit transmits authorization code “to the wireless adapter element 3180 of the proximity service unit 2920” at first proximity distance).

99. Petitioner’s misapprehension of Freeny’s second proximity distance also infects its showing for elements 4(c), 5(d), 21(c), and 22(d). Contrary to Petitioner’s argument, Freeny does not teach transmitting an authorization grant from the mobile device when it reaches the second proximity distance. Rather, as Dr. Neuman conceded under cross-examination, Freeny merely states that the store checkout system approves the transaction at the second proximity distance:

Q. So Freeny says it is the store checkout system that approves the transaction at the second proximity distance, rather than the store checkout system receiving a transaction authorization, correct?

A. In the case of Freeny, that’s what it is stating, yes.

EX2017, 181:10-182:8; see also EX1006, 33:31-36. Freeny's mobile device does not receive an authorization grant of funds, let alone forward any such authorization grant to the store checkout system. Rather, the mobile device merely sends an authorization code—which is an authorization request, not an authorization grant (EX2017, 178:4-179:3)—to the store checkout system, which then obtains approval from the billing center itself. EX1006, 33:18-36; EX2017, 177:2-179:3 (Dr. Neuman admitting that Freeny's request is sent from the mobile device and “forwarded ... through the point of sale terminal”); see also EX1006, 35:60-64 (most store checkout systems “have communication connections and thus interface via a line 2929 to a remote billing center 2950 via communication networks 2945), Fig. 29 (depicting store checkout system's connection to billing center via communication network).

C. Petitioner does not show that the references teach that “said authorization zone is within said communication zone” (Claims 5 and 22)

100. Petitioner's challenges to claims 5 and 22 rely on an incorrect inherency argument. Claims 5 and 22 recite that “said authorization zone is within said communication zone.” Petitioner's sole argument for this limitation is that it is supposedly “inherent from the disclosure in Low.” Pet. 56 (arguing that Low's authorization request is sent via short-range communication technology defining communication zone, so authorization zone “must” be within communication

zone). *Id.* But Petitioner does not argue that Low even has an authorization zone, so the recited location of that zone cannot possibly be inherent in Low. Pet., 52-53 (relying on Freeny for authorization zone); see also EX2017, 184:11-21 (confirming during cross-examination that “in Low by itself, we’re not contending that there was a separate authorization and payment zone”). Petitioner’s inherency argument is utterly without basis.

101. Further, the inherency fails even for another reason. Low discloses embodiments in which the purchase request (the alleged “authorization request”) is sent from outside the short-range communication range of the vending machine (the alleged “communication zone”). EX1004, 9:62-67 (“In certain embodiments, user device 110 may remotely purchase an item from products 124 without a short range communication link established concurrently with vending machine 120.”); EX2017, 70:11-71:4 (admitting user does not need to be within vending machine’s communication range to select product in some embodiments). Petitioner thus fails to prove that “said authorization zone is within said communication zone” is inherent in Low.

X. GROUND 4 (Low + Skowronek + Freeny, Claims 10-14)

102. This Ground fails at the outset because Low does not render obvious independent claim 10, which is similar to claim 1. Petitioner argues that independent claim 10 and dependent claims 11-14 were obvious over Low,

Skowronek, and Freeny. Claim 10 recites limitations analogous to those of claims 1, 2, and 4 discussed above in Grounds 1-3. Claim 11 recites limitations analogous to those of claim 2 discussed in Ground 2. Claim 12 recites limitations analogous to those of elements 2.iii and 19.ii discussed in Ground 2. Claim 13 recites limitations analogous to those of claim 5 discussed in Ground 3. For each of these limitations, Petitioner relies on its previous analysis and therefore inherits the previously discussed deficiencies of Grounds 1-3. Pet., 60-67.

XI. GROUND 5 (Low + Wilson, Claims 8-9, 25-26)

103. Petitioner has not shown that claims 8-9 and 25-26 would have been obvious over Low and Wilson. Ground 5 fails at the outset for the same reasons as Ground 1, since Petitioner presents no arguments to address the deficiencies with respect to independent claims 1 and 18 as discussed in connection with Ground 1

104. Further, Ground 5 exhibits additional deficiencies, in citing Wilson’s teachings involving a multi-drop bus (“MDB”) connector for the additional limitations of claims 8-9 and 25-26. As explained below, Petitioner fundamentally misreads and therefore misapplies Wilson.

A. Petitioner does not show that the references teach the recited adapter module having male and female adapters (Claims 9 and 26)

105. Claims 9 and 26 recite “said adapter module having a male adapter and a female adaptor.” Petitioner argues that “Wilson inherently discloses this

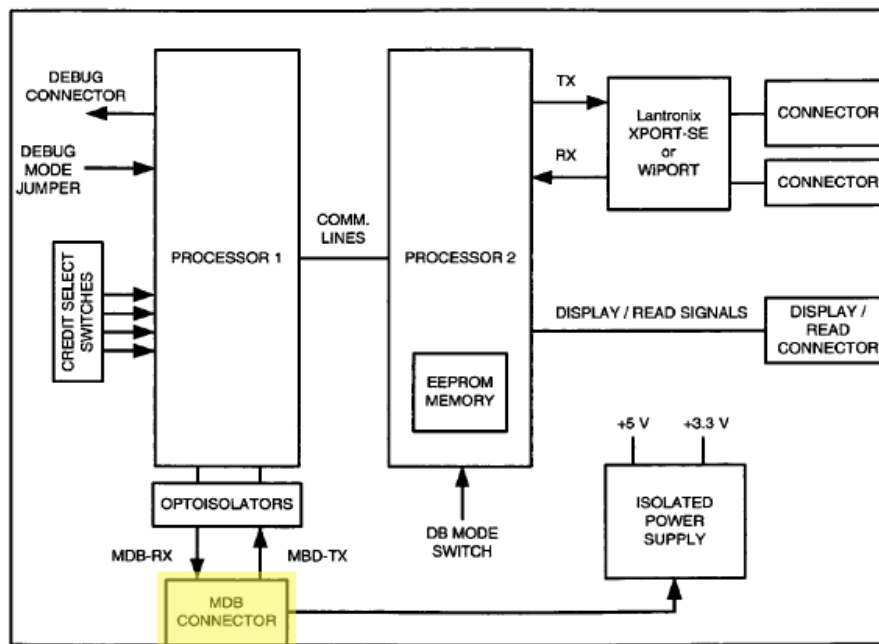
limitation” because Wilson describes using an MDB interface that is standard-compliant, and in the standard the MDB allegedly “has male and female adapters.” Pet., 75; see also *id.*, 77 (citing the same for claim 26). Petitioner asserts that Wilson’s NetVend interface is designed to connect with this standard MDB interface, “so it must have a corresponding male and female adapter to attach to the MDB interface.” *Id.*, 75 (citing EX1003, ¶¶247-48). First, this inherency theory is incorrect, and further, Petitioner’s expert admitted during cross-examination that Wilson does not teach the above limitation at all, let alone inherently disclose it.

106. Petitioner identifies no evidence showing that Wilson’s NetVend component (i.e., the alleged adapter module) necessarily has both a male adapter and a female adapter. Petitioner says that there is inherent disclosure of male and female adapters in Wilson, but actually relies on EX1008, which is neither incorporated by reference into Wilson nor applied as part of any combination in any Ground. Pet., 75 (citing EX1007, 2:34-43, 4:26-31; EX1008, 52); see also Pet., 73-74 (relying on EX1008 for element 9(a)), 75-76 (relying on EX1008 for element 9(c)).

107. Neither cited document supports Petitioner’s inherency assertion. The cited passage from column 2 in Wilson merely states that the Vending Machine Controller (“VMC”) supports the MDB/ICP standard. EX1007, 2:34-43. The cited passage of column 4 only states that the NetVend interface communicates

with the VMC via an MDB/ICP interface and “appears to the VMC 112 as a Cashless Device #1 as defined in the MDB/ICP 3.0 specifications document.” *Id.*, 4:26-31. In other words, the NetVend component connects to the MDB bus as a peripheral device, but these passages say nothing about NetVend having both a male adapter and a female adapter. In contrast, Wilson actually discloses that NetVend has a single adapter/connector for interfacing with the bus, noting that the NetVend processor “communicates with the VMC via the MDB connector.”

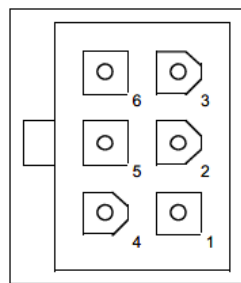
EX1007, 7:3-7. Wilson depicts this single adapter in Fig. 2:



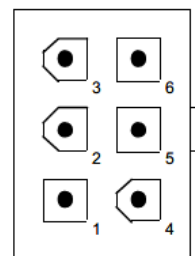
EX1007, Fig. 2 (highlighting added). I understand that Dr. Neuman admitted during his cross-examination that this figure depicts “a single MDB connector,” which would be a female connector. EX2017, 199:15-200:21 (“The NetVend device itself

has a single MDB connector, at least according to this figure.”), 205:9-16 (agreeing that MDB connector in EX1007, Fig. 2 is the female connector); EX2018 (errata sheet correcting typographical error in which “female” was incorrectly transcribed as “field”). Petitioner identifies no support for its inherency theory in Wilson, and Wilson itself refutes Petitioner’s argument.

108. As to EX1008, this document also fails to support (and instead further refutes) Petitioner’s inherency argument. Instead of supporting Petitioner’s argument that a peripheral connecting to the MDB bus necessarily has both a male adapter and female adapter, the cited page of EX1008 describes that the peripheral has a single connector (below left) for interfacing with the bus/VMC:



Peripheral Connector
Face View
Receptacle
(Sockets)

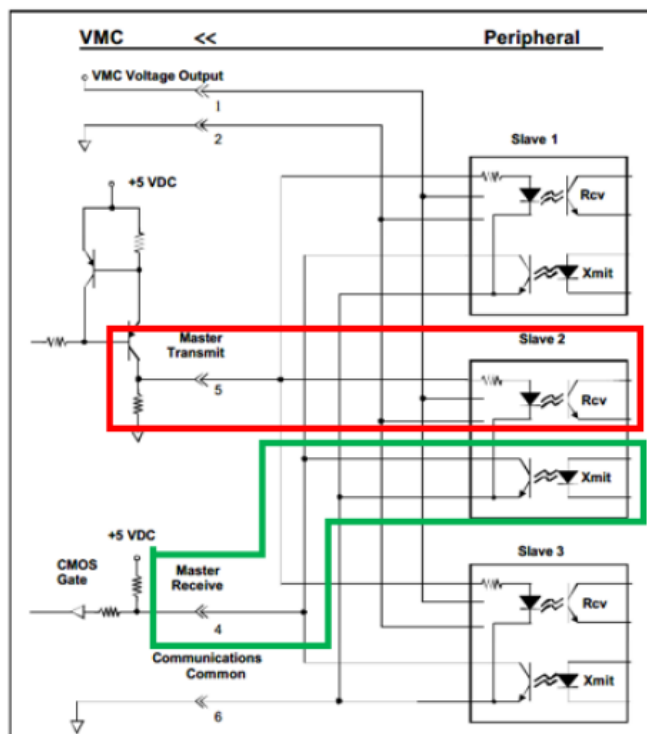


VMC / Bus Connector
Face View
Header
(Pins)

EX1008, 52. This is consistent with Wilson’s disclosure of a single adapter for the NetVend component, which is acting as a peripheral, not one with both a male adapter and a female adapter.

109. Petitioner’s argument for limitations 9(c) and 26.iii are incorrect for similar reasons. Among other requirements, the recite “connecting said male adapter of said adapter module to the female adapter of the multi-drop bus.” In addition to citing its previous analysis of element 9(b)—which, as I explained above, is incorrect—Petitioner refers to a schematic diagram in EX1008.

Petitioner’s annotations of this schematic are provided below:



Pet., 76 (adding red and green annotations to EX1008, 53). Referring to this schematic, Petitioner argues that Wilson’s NetVend component inherently (i.e., necessarily) has “male and female adapters to connect with the male and female adapters of the MDB” because “Wilson’s adapter module connects to the MDB having those standard components.” Pet., 76. However, the above schematic does

not depict peripherals that inherently include male and female adapters connecting with corresponding female and male adapters of the MDB. Rather, this schematic merely depicts the electrical connections (lines 1-6) that are shown in the figure on page 52 of EX1008 as part of a single connection between a peripheral and the MDB. In other words, this schematic is consistent with a single connection in which the peripheral has a single female connector that engages a single male connector on the MDB. EX1008, 53.

XII. GROUND 6 (Low + Freeny + Wilson, Claims 7, 24)

110. This Ground fails at the outset because Low does not render parent claims 1 or 18 obvious.

111. Ground 6 also relies on the Freeny combination from Ground 3 and does not address any of the previously discussed deficiencies described above for Ground 3.

A. Petitioner does not provide a sound reason for combining the references as proposed(Claims 7 and 24)

112. Further, Ground 7 cites teachings from Wilson in isolation without considering that Low's order of operations is fundamentally different. Petitioner argues that Wilson's server stores the "allowable credit or available cash" for users to make purchases, and that the vending machine displays these available funds. Pet., 79 (citing EX1007, Abstract, 3:4-19, 5:43-45, 9:66-10:11). That is, Wilson displays funds that are available *before* the user makes a subsequent purchase with

those funds. By contrast, Low's payment authorization—which supposedly contains information upon which the display of available funds would be based—is sent *after* the product has already been selected by the user and *after* the purchase of that product has already been approved by the payment provider server.

EX1004, 9:24-61. That is, when the payment authorization is received by Low's vending machine, the funds for the requested purchase have already been spent.

EX1004, 9:24-58 (payment provider server “approves the purchase request”),
11:56-12:2 (payment provider server may “charg[e] the account/funding card”),
12:2-8 (user device receives payment authorization or redeemable receipt).

Petitioner overlooks this discrepancy and identifies no logical reason to display cash/credit that is available for a subsequent purchases (i.e., the teachings of Wilson that Petitioner proposes applying to Low) “based on information from said authorization grant” when the alleged authorization grant in Low is received after the purchase has already been authorized.

113. Petitioner also argues that the display of available funds (the available credit/cash in a user's account) would be “based on the information in the authorization grant” but fails to show that the alleged authorization grant (Low's payment authorization) contains information that could form the basis of this display. Pet., 79. Petitioner does not explain what information is in Low's payment authorization, let alone explain how the display of available funds could

be based on such information. *Id.* In any event, Low does not teach or suggest that the payment authorization includes the user's available funds or any other information that would allow a display of available funds. EX1004, 9:53-55 ("The payment authorization may include an encrypted message, the machine identifier, and/or product code for dispensing the purchased item."). Petitioner's argument is inconsistent with disclosure of Low.

B. Petitioner does not show that the proposed combination satisfies "displaying funds available based on information from said authorization grant" (Claims 7 and 24)

114. Even setting aside the illogical rationale for modifying Low, the result of the proposed modification still would not satisfy "displaying funds available based on information from said authorization grant" for the same reasons I presented in the previous section. In Ground 7, Petitioner does not propose modifying the content of Low's payment authorization, which Petitioner argues is the recited "authorization grant." *See* Pet., 78; *see also id.*, 69-71 (proposed modification of Low in view of Wilson in Ground 5). Rather, citing the stated reasons for combining Low and Wilson from Ground 5, Petitioner argues that "a POSITA would have been motivated to apply Wilson's teaching of displaying available funds **based on the information in the authorization grant in Low.**" Pet., 80 (emphasis added). As I explained above, however, Low merely discloses that the payment authorization "may include an encrypted message, the machine

identifier, and/or product code for dispensing the purchased item.” EX1004, 9:53-55. Accordingly, even if Low, Freeny, and Wilson were combined as proposed, the resulting combination would not be able to display funds available “based on information from said authorization grant,” as recited, because the alleged authorization grant does not include information indicating available funds.

XIII. GROUND 7 (Low + Skowronek + Freeny + Wilson, Claims 15-17)

115. This Ground fails at the outset because Low does not render parent claims 10 obvious. However, Ground 7 also fails for these additional reasons:

116. Claims 15-17 each depend from independent claim 10, and Ground 7 builds upon Ground 4’s challenge to claim 10 without addressing any of the previously discussed deficiencies of Ground 4 (which are themselves inherited from Grounds 1-3, q.v.). Each challenge in Ground 7 thus fails for the same reasons discussed in Grounds 1-4. Claims 15-17 also include limitations analogous to the previously discussed limitations of claims 7-9, respectively. Ground 7 relies on the analysis from previous grounds for these limitations and therefore fails for the same reasons discussed in Grounds 5 and 6.

XIV. CONCLUSIONS

117. 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 Petitioner had not established that any Challenged Claim is invalid.

XV. JURAT

118. 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 remotely within the United States during the time allotted for such cross-examination at a time and place agreed by counsel.

119. 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.

120. I 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 or Title 18 of the United States Code.

Executed April 17, 2024 at Waco, Texas.

/Michael Ian Shamos/
Michael I. Shamos

XVI. Appendix A – Materials Cited

EX. NO.	DESCRIPTION
1001	U.S. Patent No. 8,856,045
1003	Declaration of Dr. Clifford Neuman
1004	U.S. Patent No. 10,210,501 to Low et al.
1005	U.S. Patent Pub. No. 2009/0106160 to Skowronek
1006	U.S. Patent No. 8,958,846 to Freeny
1007	U.S. Patent No. 7,455,223 to Wilson et al.
1008	Multi-Drop Bus/Internal Communication Protocol (MDB/ICP) Specification, Version 3.0, March 26, 2003
2017	Transcript of March 26, 2024 Cross-Examination of Dr. B. Clifford Neuman
2018	Errata Sheet for March 26, 2024 Cross-Examination of Dr. B. Clifford Neuman
2019	Resume of Dr. Michael I. Shamos, Ph.D., J.D.