

UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE PATENT TRIAL AND APPEAL BOARD

CSC SERVICEWORKS, INC.,
Petitioner,

v.

PAYRANGE, INC.,
Patent Owner.

IPR2023-01186
U.S. Patent No. 8,856,045

**PETITION FOR *INTER PARTES* REVIEW
UNDER 35 U.S.C. § 312 AND 37 C.F.R. § 42.104**

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PETITIONER'S EXHIBIT LIST

Ex. 1001	U.S. Patent No. 8,856,045
Ex. 1002	Prosecution History of U.S. Patent No. 8,856,045
Ex. 1003	Declaration of Dr. Clifford Neuman
Ex. 1004	U.S. Patent No. 10,210,501 to Low et al.
Ex. 1005	U.S. Patent Pub. No. 2009/0106160 to Skowronek
Ex. 1006	U.S. Patent No. 8,958,846 to Freeny
Ex. 1007	U.S. Patent No. 7,455,223 to Wilson et al.
Ex. 1008	Multi-Drop Bus/Internal Communication Protocol (MDB/ICP) Specification, Version 3.0, March 26, 2003
Ex. 1009	Curriculum Vitae of Dr. Clifford Neuman
Ex. 1010	Statistics regarding Motions to Stay for Judge Noreika
Ex. 1011	Statistics regarding Median Time To Trial for District of Delaware
Ex. 1012	Waiver of Service of Complaint (July 18, 2022)

I. INTRODUCTION

CSC ServiceWorks, Inc. (“Petitioner”) respectfully requests the Board institute *inter partes* review of and cancel claims 1-26 (“the Challenged Claims”) of U.S. Patent No. 8,856,045 (“the ‘045 Patent,” Ex.1001).

II. GROUNDS FOR STANDING

Petitioner certifies that the ‘045 patent is eligible for IPR and that Petitioner is not barred or estopped from requesting IPR challenging the patent claims. 37 C.F.R. § 42.104(a). This petition is timely because Petitioner first filed a waiver of service of a complaint asserting the ‘045 patent on July 18, 2022, which means Petitioner was served not more than one year ago. Ex.1012; Fed R. Civ. P. 4(d)(4) (complaint is deemed “served at the time of filing the waiver”); *Brinkmann Corp. v. A&J Mfg., LLC*, IPR2015-00056, Paper 10 at 6–7 (PTAB March 23, 2015) (holding that the date a waiver of service is filed is the date that a petitioner is deemed to have been served).

III. NOTE

Petitioner cites to exhibits’ original page numbers. **Emphasis** in quoted material has been added. Claim terms are presented in *italics*.

IV. SUMMARY OF THE ‘045 PATENT

The ‘045 patent relates to mobile payments, in particular, “mobile-device-to-machine payment systems over a non-persistent network connection.” Ex.1001,

1:14-17. The ‘045 patent explains that the concept of payment on a machine (a “payment accepting unit”) has been around for “thousands of years.” Ex.1001, 1:18-19. By the time the ‘045 patent application was filed, the concept of payment on machines was well known and used in commercial applications such as “vending machines,” “parking meters, toll booths, laundromat washers and dryers, arcade games, kiosks, photo booths, toll booths, [and] transit ticket dispensing machines.” Ex.1001, 1:31-38. It was further already known that mobile payments could be completed using a machine “that is designed to communicate with a cellular phone such that it dispenses a product when it receives information indicating that the product has been selected.” Ex.1001, 2:15-18. These mobile payment systems included “an interface to communicate with users, a communications system that enables it to act as part of a network and communicate with a central system, and a controller, that articulates the communication among the above mentioned components, to enable a central system to perform diverse actions on a vending machine.” Ex.1001, 2:56-61. Prior-art mobile payment systems also included authorization steps performed by a “remote payment server.” Ex.1001, 3:27-30.

The ‘045 patent alleges, however, that prior-art mobile payment systems required a persistent network connection to connect to a remote server to facilitate cashless payment and resulted in the unavailability of mobile payments if that connection is interrupted. Ex.1001, 10:1-19. The ‘045 patent thus proposes a method

whereby the user's mobile phone uses short-range, non-persistent communication technology to communicate with an adapter module of a machine. Ex.1001, 13:22-34. As shown in this petition, however, this alleged "improvement" was already described in the prior art.

In more detail, the '045 patent describes the adapter module being connected to the machine (the "*payment accepting unit*") via a wired or serial connection, such that the adapter module controls the dispensation of items or services on the machine. Ex.1001, 18:48-50; 19:58-67. The adapter module sends an authorization request for funds to the user's mobile device via short-range communication technology, such as Bluetooth. Ex.1001, 3:52-54. The user's mobile device then forwards that request to the server using long-range communication technology such as Wifi or a cellular connection. Ex.1001, 3:54-56. The server then sends an authorization grant back to the mobile device via long-range communication technology, and the mobile device then "forwards the authorization grant for funds to the adapter module using short-range communication technology." Ex.1001, 3:56-60. The payment accepting unit then dispenses the item or service. Ex.1001, 3:60-64; Fig. 5.

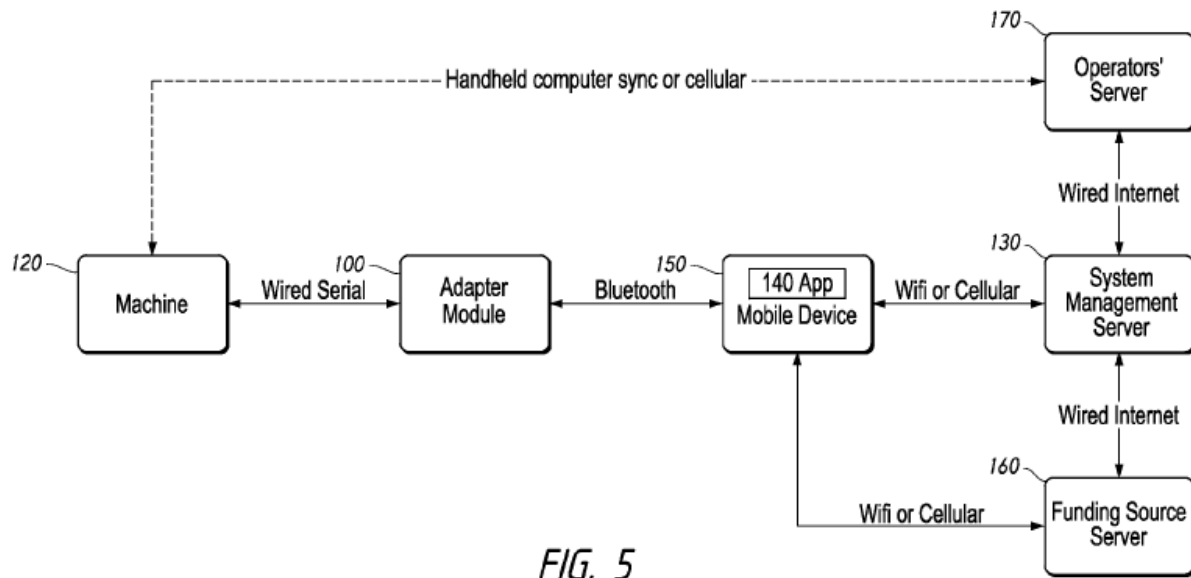


FIG. 5

As shown below, all of these electronic payment concepts claimed by the ‘045 patent were previously known in the art.

V. PROSECUTION HISTORY

The ‘045 patent claims priority to U.S. Provisional Application No. 61/917,936, filed December 18, 2013. It is unnecessary to determine whether the ‘045 patent is entitled to its earliest possible priority date because the prior art relied upon herein pre-dates the earliest possible priority date.

U.S. Application No. 14/214,644, the application leading to the issuance of the ‘045 patent, was a first action allowance with no rejections on the merits. The Applicant received a Notice of Allowability on June 3, 2014. Ex.1002, 399. The ‘045 patent then issued on October 7, 2014. Ex.1002, 540.

VI. LEVEL OF ORDINARY SKILL IN THE ART

A person of ordinary skill in the art (“POSITA”) of the ‘045 patent in December of 2013 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. Ex.1003, ¶19.

VII. CLAIM CONSTRUCTION

Petitioner submits that for the purposes of this proceeding, the terms of the challenged claims should be given their plain and ordinary meaning, and no terms require specific construction.¹

VIII. RELIEF REQUESTED AND THE REASONS FOR THE REQUESTED RELIEF

Petitioner asks that the Board institute a trial for *inter partes* review and cancel the Challenged Claims in view of the analysis below.

¹ Petitioner does not concede that any term in the challenged claims meets the statutory requirements of 35 U.S.C. 112, or that the challenged claims recite patentable subject matter under 35 U.S.C. 101.

IX. DISCRETIONARY DENIAL WOULD BE INAPPROPRIATE

A. Discretionary denial under the *Fintiv* factors is not appropriate

The *Fintiv* factors (enumerated below) weigh against discretionary denial. IPR2020-00019, Paper 11, 5-6 (PTAB Mar. 20, 2020) (precedential). The “Interim Procedure for Discretionary Denials in AIA Post-Grant Proceedings with Parallel District Court Litigation” dated June 21, 2022 (“Interim Guidance”) and recent Board decisions applying these factors confirm discretionary denial is not warranted here.

1. Factor 1: Institution Will Enable a Stay

The parallel district court litigation between PayRange and CSC is pending in the District of Delaware before Judge Noreika. *See PayRange Inc. v. CSC ServiceWorks, Inc.*, 1:23-cv-00278-MN (D. Del.). According to statistics produced by Lex Machina, since taking the bench in 2018, Judge Noreika has granted stays pending IPR in approximately 78% of all patent cases where a stay was sought. Ex.1010. CSC intends to seek a stay of the district court proceedings pending final resolution of these IPR proceedings. As such, institution will likely enable a stay of the district court proceedings. This factor favors institution.

2. Factor 2: District Court Schedule

As set forth in the Interim Guidance, “when considering the proximity of the district court’s trial date to the date when the PTAB final written decision will be

due, the PTAB will consider the median time from filing to disposition of the civil trial for the district in which the parallel litigation resides.” Interim Guidance, 3. Here, the anticipated trial date, as computed in accordance with the Interim Guidance, is January 2026 (33.7 months from March 15, 2023) Ex.1011. The due date for a final written decision is approximately January 2025 (18 months after filing). Accordingly, the final written decision will almost certainly issue prior to the district court litigation reaching trial in the unlikely event the district court proceedings are not stayed. This factor favors institution.

3. Factor 3: Parallel Proceeding Considerations

The District Court in the underlying litigation has not yet issued any substantive order related to the challenged patent. A scheduling order has not even been entered. The case is at the pleading stage.

Moreover, this petition was diligently filed approximately three months after PayRange filed its Complaint in the District Court litigation. This factor weighs against discretionary denial.

4. Factor 4: The Petition Raises Unique Issues

Under the Interim Guidance, “the PTAB will not discretionarily deny institution of an IPR or PGR in view of parallel district court litigation where a petitioner stipulates not to pursue in a parallel district court proceeding the same grounds as in the petition or any grounds that could have reasonably been raised in

the petition.” Interim Guidance, 7. Referred to as a *Sotera* stipulation, “[t]his clarification avoids inconsistent outcomes between the PTAB and the district court and allows the PTAB to review grounds that the parallel district court litigation will not resolve.” *Id.* at 7–8. The Interim Guidance is “binding agency guidance” to the Board. Interim Guidance, 3.

Consistent with this guidance, Petitioner stipulates that, if the instant IPR is instituted, it will not pursue against the ‘045 patent in the parallel district court proceeding the same grounds as in the petition or any grounds that could have reasonably been raised in the petition. Accordingly, the Board should not discretionarily deny institution under *Fintiv*.

5. Factor 5: The Petition Will Enable Cancellation of Claims that Might be Reasserted

CSC’s petition is potentially helpful to future defendants. CSC’s status as both Petitioner and Defendant therefore is, at worst, a neutral factor. Institution would serve overall efficiency, enabling the Board to determine unpatentability of claims that Patent Owner might otherwise later assert against others.

Further, members of the Board have noted that *Fintiv* addresses only the scenario in which the petitioner is unrelated to a defendant in a parallel proceeding, finding this should weigh against denying institution, but that *Fintiv* “says nothing about situations in which the petitioner is the same as, or is related to, the district

court defendant.” *Cisco Sys., Inc. v. Ramot at Tel Aviv Univ. Ltd.*, IPR2020-00122, Paper 15, at *10-11 (PTAB May 15, 2020) (APJ Crumbley, dissenting).

6. Factor 6: Other Considerations Support Institution

Petitioner submits that there is compelling evidence to institute *inter partes* review of the ‘045 patent. As set forth below, the Petition goes beyond merely providing sufficient evidence to meet the statutory institution threshold; instead, the Petition presents compelling evidence of unpatentability in light of Low and the combinations of Low, Skowronek, Freeny, and Wilson, such that, if unrebutted in trial, would lead to a conclusion that claims 1-26 are unpatentable by a preponderance of the evidence. Interim Guidance, 4-5.

In summary, the *Fintiv* factors altogether weigh against discretionary denial. Even if the Board were to determine that *Fintiv* factors on balance weigh in favor of denial, institution should nonetheless be granted because this Petition satisfies the compelling merits standards. Interim Guidance, 4; *Vizio, Inc. v. Maxell, Ltd.*, IPR2022-01458, Paper 8, at 62.

X. IDENTIFICATION OF HOW THE CLAIMS ARE UNPATENTABLE

A. Challenged Claims

Petitioner challenges claims 1-26.

B. Statutory Grounds for Challenges

Grounds	Claim(s)	Basis
#1	1, 18	are anticipated under 35 U.S.C. 102 by Low and obvious under 35 U.S.C. 103 over Low
#2	2-3, 19-20	are obvious under 35 U.S.C. 103 over Low in view of Skowronek
#3	4-6, 21-23	are obvious under 35 U.S.C. 103 over Low in view of Freeny
#4	10-14	are obvious under 35 U.S.C. 103 over Low in view of Skowronek and Freeny
#5	8-9, 25-26	are obvious under 35 U.S.C. 103 over Low in view of Wilson
#6	7, 24	are obvious under 35 U.S.C. 103 over Low in view of Freeny and Wilson
#7	15-17	are obvious under 35 U.S.C. 103 over Low in view of Skowronek , Freeny , and Wilson

U.S. Patent No. 10,201,501 to Low *et al.* (“**Low**,” Ex.1004) was filed on July 25, 2013. Low is thus prior art under at least 35 U.S.C. § 102(a)(2).

U.S. Patent Publication No. 2009/1016160 to Skowronek (“**Skowronek**,” Ex.1005) was filed on October 19, 2007 and published on April 23, 2009. Skowronek is thus prior art under at least U.S.C. § 102(a)(1).

U.S. Patent No. 8,958,846 to Freeny (“**Freeny**,” Ex.1006) was filed on August 23, 2006. Freeny is thus prior art under at least 35 U.S.C. § 102(a)(2).

U.S. Patent No. 7,455,223 to Wilson et al. (“**Wilson**,” Ex.1007) was filed on August 29, 2005. Wilson is thus prior art under at least 35 U.S.C. § 102(a)(2).

None of Low, Skowronek, Freeny, or Wilson was cited or substantively discussed during prosecution of the ‘045 patent.

C. Ground 1: Claims 1 and 18 are anticipated under 35 U.S.C. § 102 by Low and obvious under 35 U.S.C. § 103 over Low

1. Summary of Low

Similar to the ‘045 patent, Low relates to “wireless electronic payments to non-Internet connected machines through user devices.” Ex.1004, 1:16-20. Low discloses a non-Internet connected machine (*i.e.*, a vending machine), lacking an internet connection with a network, but having “capability of wireline or wireless communication with user device 110, for example using microwave, radio frequency, infrared, Bluetooth, and near field communication.” *Id.*, 2:10-16; 4:57-64. The “user device” is a “consumer device, such as a smart phone or computing tablet.” *Id.*, 2:10-16. The machine communicates with the user’s device via an “electronic payment module” having a “storage and communication interface to store and communicate a machine identifier and other transaction information, as well as processing (including decrypting) information for dispensing purchased items from vending machine.” *Id.*, 4:64-5:3; *see also* 5:54-61; 6:9-16. The vending machine includes a product dispensing module including input mechanisms for allowing a user to make

selections of desired items to purchase and dispense. *Id.*, 5:19-30. The electronic payment module of the vending machine communicates with the user device to enable electronic payments without physical money. *Id.*, 5:44-46.

The user device communicates with remote servers, including a “payment provider server” over a wireless network, such as “a DSL (*e.g.*, Digital Subscriber Line) modem, a PSTN (Public Switched Telephone Network) modem, an Ethernet device, a broadband device, a satellite device and/or various other types of wired and/or wireless network communication devices” to complete the transaction. *Id.*, 7:40-50; *see also* 3:20-25; 4:45-56. This arrangement is shown, for example, in Figure 4 below:

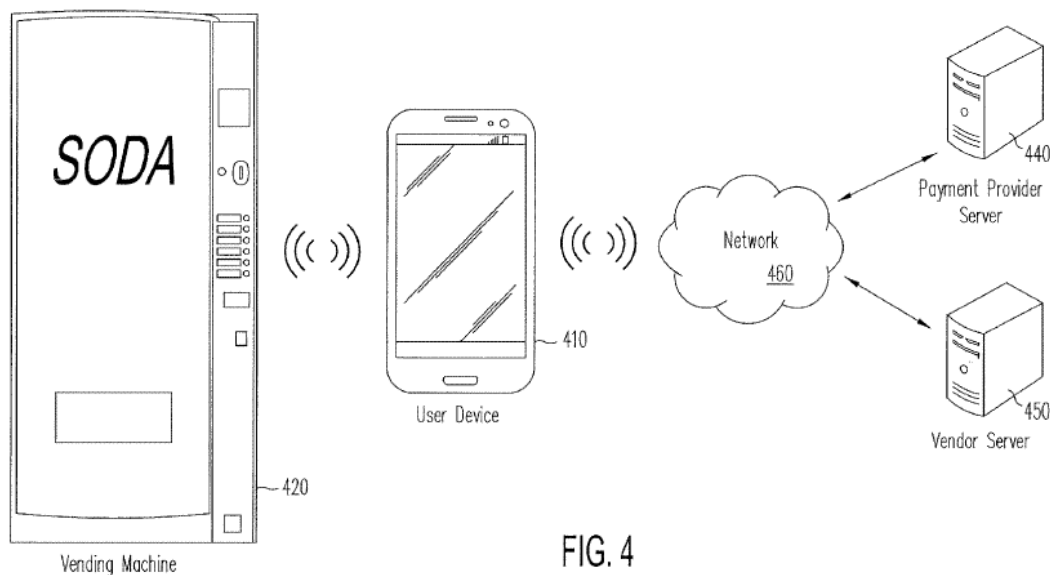


FIG. 4

Once the transaction is authorized by the remote “payment provider server,” the authorization is transmitted back to the user device (in some cases, after being routed to a “vendor server”), then the user device transmits said authorization to the machine to allow the user to dispense the products. *Id.*, 2:49-62 (“After processing, the payment provider may approve the payment request and communicate the approval directly to an operator of the machine, such as a vendor server, or may communicate the approval to the user device to be transmitted to the operator of the machine.”); *see also* 2:34-37, 9:39-62, 10:55-61, 12:9-12.

2. Claim 1

[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,

First, Low describes a system and method for purchasing products on a non-Internet connected vending machine (“*payment accepting unit*”) using a user device, such as a smart phone (“*mobile device*”). Ex.1004, 2:11-16; 5:24-35. Low’s system is for “*facilitating a cashless transaction*” as it “enables [a] **user 102** to make electronic payments for products 124 **in the absence of physical money.**” *Id.*, 5:44-46. The vending machine dispenses “*at least one product or service*” as a result of the transaction: “Products 124 may include purchasable products for user 102, such as drinks, food, items, or other purchasable products included in vending machine 120.” Ex.1004, 5:30-35; Ex.1003, ¶¶76-77.

Second, Low discloses its “*payment accepting unit*” having “*input mechanisms*”: “Vending machine 120 may also include an (sic) product dispensing module 122 for accepting user **input**, such as for selecting desired items to purchase.” *Id.*, 5:3-5:9. The product dispensing module “may include means to select a product, such as using a keypad, touchscreen, display, or other selection means.” *Id.*, 5:19-24. A POSITA would have understood inputs, such as a keypad and touchscreen, to comprise multiple *input mechanisms*, because a keypad would have been understood to have multiple keys and a touchscreen would have been understood to have multiple touch points. Ex.1003, ¶¶78-79.

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

Low describes a user device (“*mobile device*”) which is a “personal computer (PC), a smart phone, personal digital assistant (PDA), laptop computer, and/or other types of computing devices capable of transmitting and/or receiving data, such as an IPAD® from APPLE®.” Ex.1004, 3:37-48. The user device may communicate with the machine “via wireless communication, such as Bluetooth or NFC (Near Field Communication)”—*i.e.*, via “*short range communication technology*.” *Id.*, 2:11-16; 4:57-5:9. “Bluetooth” and “near-field communication” are two examples of “*short range communication technology*” disclosed in the ‘045 patent. Ex.1001, 13:22-32. The user device described in Low may also communicate with a network, such as “a

LAN, WLAN, PTSN, and/or various other wired or wireless networks, including telecommunications, mobile, and cellular phone networks)—i.e., via “*long range communication technology*.” *Id.*, 13:30-39; *see also id.* at 4:45-56 (describing the user device’s communication module 118); 8:40-57 (providing other examples of network technologies for Network 160 that the user device may communicate with). A “hard-wired, telephone network technology, cellular technology” or “wide area network (WAN), local area network (LAN), or any wired or wireless communication technology over the internet” are examples of “*long range communication technology*” disclosed in the ‘045 patent. Ex.1001, 13:4-10. Ex.1003, ¶¶80-83.

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

The vending machine (“*payment accepting unit*”) disclosed in Low is for “dispensing items that are purchased.” Ex.1004, 4:57-59. Those items include “drinks, food, items, or other purchasable products included in vending machine.” *Id.*, 5:30-35; Ex.1003, ¶¶84-85.

[1(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;

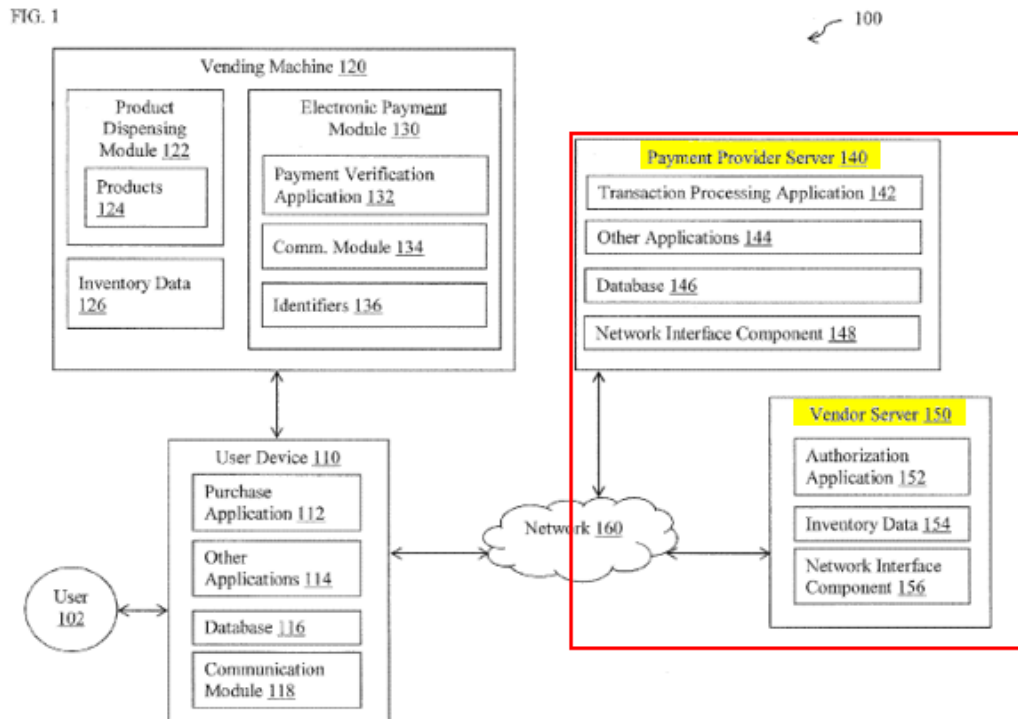
First, Low describes an “*adapter module*” in the form of “an electronic payment module 130 having storage and [a] communication interface.” Ex.1004, 4:64-67. The electronic payment module is *associated with* the vending machine

(“*payment accepting unit*”) because it is part of the vending machine. *Id.*, 5:44-46 (“Electronic payment module 130 **included** with vending machine 120....”); 5:10-18. The electronic payment module may be implemented as one or more “hardware” components within the vending machine (*id.*, 5:14-17; 5:49-53), consistent with the ‘045 patent’s description of the “*adapter module*” as “a physical device that is installed in a machine.” Ex.1001, 11:59-61; Ex.1003, ¶¶86-88.

Second, Low discloses that the electronic payment module (“*adapter module*”) includes a “communication module 134” which is “adapted to communicate with user device 110.” Ex.1004, 6:9-16. Low’s electronic payment module communicates with the user device (“*mobile device*”) via “*short-range communication technology*” including “various types of wired and/or wireless short range communication devices including microwave, radio frequency, infrared, Bluetooth, and near field communication devices.” *Id.*; *see also id.*, 4:57-5:3. Again, these are consistent with the *short-range communication technology* disclosed in the ‘045 patent. Ex.1001, 13:22-32; Ex.1003, ¶89.

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

Low discloses a payment provider server and vendor server (collectively, a “server”), as shown below²:



Ex.1004, 7:40-50, FIG. 4. The “user device 110 is in communication over a network 160 with a payment provider server 140 and a vendor server 150.” *Id.*, 3:18-25. The user device and the server communicate via “*long-range communication*

² Petitioner notes that the ‘045 patent discloses that its “server” may be comprised of multiple servers. Ex.1001, 19:51-54 (“The shown components have been simplified in that, for example, only one mobile device 150 (or machine 120, adapter module 100, or server 130) is shown where many may be included.”).

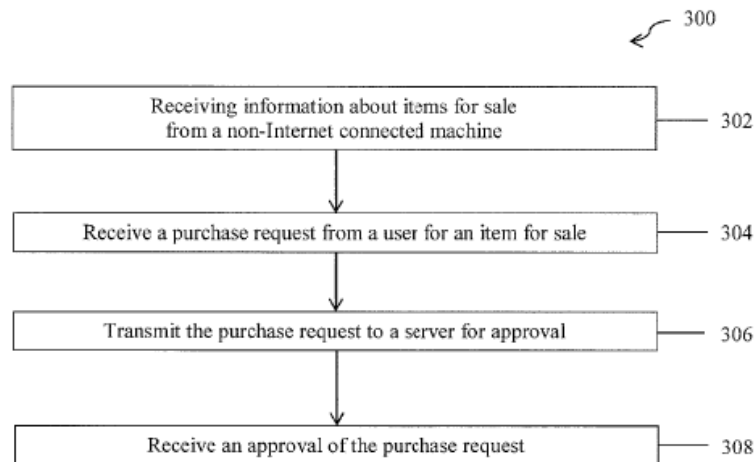
technology,” over network 160 using a network interface comprising “a DSL (e.g., Digital Subscriber Line) modem, a PSTN (Public Switched Telephone Network) modem, an Ethernet device, a broadband device, a satellite device and/or various other types of wired and/or wireless network communication devices,” as well as the internet. Id., 7:40-50, 8:48-57; Ex.1003, ¶¶90-92.

[1(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

First, Low discloses that the electronic payment module (“*adapter module*”) contains a “payment verification application” which may “correspond to processes, procedures, and/or applications executable by a hardware processor, for example, a software program.” Ex.1004, 5:61-6:9. The payment verification application may transmit a “purchase request” (“*authorization request for funds*”) to the user device, such request including “a product name, product price, product code, a machine identifier, and/or a transaction number **to user device 110.**” *Id.*, 5:66-6:3; 2:38-46. As discussed for 1(a), the electronic payment module communicates with the user device using “*short-range communication technology*,” including “various types of wired and/or wireless short range communication devices including microwave, radio frequency, infrared, Bluetooth, and near field communication devices.” *Id.*, 4:45-56; Ex.1003, ¶¶93-95.

Second, Low discloses that after the purchase request (“*authorization request for funds*”) is received by the user device, it is transmitted (“*forward[ed]*”) to payment provider server 140. *Id.*, 5:61-6:9. As demonstrated by FIG. 3 below, “the purchase request” received by the user device is transmitted (“*forward[ed]*”) to the server for approval (step 306):

FIG. 3



Id., FIG. 3. As described above for 1(b), the user device and the server communicate via “*long-range communication technology*,” over a network interface comprising “a DSL (e.g., Digital Subscriber Line) modem, a PSTN (Public Switched Telephone Network) modem, an Ethernet device, a broadband device, a satellite device and/or various other types of wired and/or wireless network communication devices,” as well as the internet. *Id.*, 7:40-50, 8:48-57; Ex.1003, ¶¶96-97.

[1(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;

First, Low discloses that the payment provider server 140 (part of said “server”) executes a transaction processing application to review and approve the purchase request. Ex.1004, 9:24-62; 10:41-61. The transaction processing application 142 then communicates a payment authorization (“*authorization grant for funds*”) to the user device. *Id.*, 9:39-62 (“payment provider server 140 may communicate the payment authorization included in the approval to user device 110 for transmission to vending machine 120”); 10:55-61. As described above for 1(b) and 1(c), the user device and the server communicate via “*long-range communication technology*,” over a network interface comprising “a DSL (e.g., Digital Subscriber Line) modem, a PSTN (Public Switched Telephone Network) modem, an Ethernet device, a broadband device, a satellite device and/or various other types of wired and/or wireless network communication devices.” *Id.*, 7:40-50; *see also id.* at 4:45-56; 8:48-57; Ex.1003, ¶¶98-100.

Second, Low discloses that once the payment authorization (“*authorization grant for funds*”) is communicated to the user device, the user device “transmit[s]” (“*forward[s]*”) the payment authorization to the vending machine 120. *Id.*, 12:9-19; *see also id.* at 9:39-62 (“payment provider server 140 may communicate the payment

authorization included in the approval to user device 110 **for transmission to** vending machine 120”); 10:55-61; 12:20-21. Specifically, the payment authorization included in the approval is communicated to the electronic payment module (“*said adapter module*”) of the vending machine. *Id.*, 10:57-61. As discussed for 1(a) and 1(c), the vending machine (via the electronic payment module) communicates with the user device using “*short-range communication technology*,” including “various types of wired and/or wireless short range communication devices including microwave, radio frequency, infrared, Bluetooth, and near field communication devices.” *Id.*, 4:45-56; *see also id.* at 4:59-64; 6:9-16; Ex.1003, ¶¶101-102.

[1(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.

Low discloses that the vending machine 120 (“*payment accepting unit*”) includes both an electronic payment module (“*adapter module*”) and a “dispensing module, such as product dispensing module 122, for a user to make selections, purchase, and dispense products 124.” Ex.1004, 5:19-22. The product dispensing module may include a “means to select a product, such as using a keypad, touchscreen, display, or other selection means,” *i.e.*, an “*input mechanism*.” *Id.*, 5:22-24. The product dispensing module is “configured to interact with electronic payment module 130 to accept electronic payment for products 124.” *Id.*, 5:26-30.

Once the user has used the product selection means “*input mechanism*” to select a product, and once the purchase request has been sent to the server via the user device and a payment authorization has been forwarded back to the electronic payment module (“*adapter module*”) of the vending machine via the user device, the “vending machine 120 may dispense the purchased item of products 124.” *Id.*, 9:39-62; *see also id.* at 10:55-61; 12:9-25; Ex.1003, ¶¶103-105.

3. Claim 18

[18(pre)] A method for using 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,

See [1(pre)]. Ex.1003, ¶106.

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

See [1(pre.i)]. Ex.1003, ¶107.

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

See [1(pre.ii)]. Ex.1003, ¶108.

[18(a)] sending an authorization request for funds to the mobile device using short-range communication technology of an adapter module associated with the payment accepting unit;

See [1(c)]. Ex.1003, ¶109.

[18(b)] receiving said authorization request for funds from said short-range communication technology of said adapter module at the short-range communication technology of the mobile device;

See [1(c)]. Ex.1003, ¶110.

In addition, this limitation is also inherent from Low’s disclosure. To establish that a prior art reference inherently discloses a claim limitation, the limitation at issue “necessarily must be present.” *PAR Pharm., Inc. v. TWI Pharm., Inc.*, 773 F.3d 1186, 1196 (Fed. Cir. 2014). In other words, a limitation is inherent where “*the natural result flowing from the operation as taught would result in the performance of the questioned function.*” *Id.* at 1195 (emphasis in original). Ex.1003, ¶111.

In this case, as explained above for [1(c)], Low discloses that the payment verification application of the electronic payment module (“*adapter module*”) transmits a “purchase request” (“*authorization request for funds*”) to the user device (“*mobile device*”) via short-range communication technology, and the user device receives the request. Ex.1004, 2:38-49, 4:45-64, 5:66-6:16. Because the purchase request is being transmitted to the user device via short-range communication technology and the user device receives the request, the user device must necessarily “*receive*” the request with the corresponding short-range communication technology. Ex.1003, ¶111.

[18(c)] forwarding said authorization request for funds to a server using the long-range communication technology of the mobile device;

See [1(c)]. Ex.1003, ¶112.

[18(d)] receiving said authorization request for funds from the long-range communication technology of the mobile device at long-range communication technology of said server;

See [1(c)]. Ex.1003, ¶113.

In addition, this limitation is also inherent from Low’s disclosure. As described above for [1(c)], Low discloses that after the purchase request (“*authorization request for funds*”) is received by the user device, it is transmitted (“*forward[ed]*”) to payment provider server 140 via long-range communication technology and is received by the payment provider server 140. Ex.1004, 5:61-6:9, 6:51-64, 7:40-50; 10:41-61. Because the purchase request is being transmitted to the server via long-range communication technology and the server receives the request, the server must necessarily “*receive*” the request with the corresponding long-range communication technology. Ex.1003, ¶114.

[18(e)] sending an authorization grant for funds to the mobile device using said long-range communication technology of said server;

See [1(d)]. Ex.1003, ¶115.

[18(f)] receiving said authorization grant for funds from long-range communication technology of said server at the long-range communication technology of the mobile device;

See [1(d)]. Ex.1003, ¶116.

In addition, this limitation is also inherent from Low's disclosure. As described above for [1(d)], the transaction processing application 142 of the server communicates a payment authorization ("*authorization grant for funds*") to the user device using long-range communication technology and the user device receives the authorization. Ex.1004, 7:40-50; 9:39-62; 12:2-19. Because the payment authorization is being transmitted to the user device via long-range communication technology and the user device receives the authorization, the user device must necessarily "*receive*" the authorization with the corresponding long-range communication technology. Ex.1003, ¶117.

[18(g)] forwarding said authorization grant for funds to said adapter module using the short-range communication technology of the mobile device;

See [1(d)]. Ex.1003, ¶118.

[18(h)] receiving said authorization grant for funds from the short-range communication technology of the mobile device at short-range communication technology of said adapter module; and

See [1(d)]. Ex.1003, ¶119.

In addition, this limitation is also inherent from Low’s disclosure. As described above for [1(e)], Low discloses that the user device “transmit[s]” (“*forward[s]*”) the payment authorization to the electronic payment module (“*adapter module*”) of the vending machine 120 via short-range communication technology, and the module receives the authorization. Ex.1004, 4:45-56; 9:39-62; 10:55-61; 12:9-19. Because the payment authorization is being transmitted to the electronic payment module via short-range communication technology and the module receives the authorization, the module must necessarily “*receive*” the authorization with the corresponding short-range communication technology. Ex.1003, ¶120.

[18(i)] dispensing the at least one product or service from the payment accepting unit in response to receiving user input to the payment accepting unit input mechanism if said adapter module has received said authorization grant.

See [1(e)]. Ex.1003, ¶121.

D. Ground 2: Claims 2-3 and 19-20 are obvious under 35 U.S.C. § 103 over Low in view of Skowronek

1. Summary of Low

See Sec. X.C.1. Ex.1003, ¶¶36-40.

2. Summary of Skowronek

Skowronek relates to “contactless payments for a retail service that an unattended retail device provides.” Ex.1005, [0001]. Like the “*payment accepting unit*” in the ‘045 patent, an “unattended retail device” is a device that “provides a retail service or product without the assistance of a person,” such as a vending machine. *Id.*, [0002]. Like in the ‘045 patent and Low, Skowronek’s system and methods use a user’s mobile device to act as a communication intermediary between the payment accepting unit and remote servers which process the transaction. *Id.*, [0016].

Skowronek discloses that the unattended retail device 102 communicates with the mobile appliance 104 via a first communications channel 112, which can be “Bluetooth R, 802.11g, or other wireless system.” *Id.*, [0022]. The mobile appliance 104 may communicate with a merchant processor 108 over a second communications channel 114, using “a cellular network, a wireless LAN or WAN, or other communication system.” *Id.*, [0024]. When a transaction is initiated, either by the unattended retail device 102 or by the consumer on the mobile appliance 104, the “unattended retail device 102 compiles transaction information” which is “compiled into a packet of information for transfer over the first communications channel 112 to the mobile appliance 104.” *Id.*, [0026]. This packet of transaction information may be “encrypted for transmission.” *Id.* The encryption may be such that it “cannot be

decrypted by the mobile appliance” so that the transaction details are “preserved without tampering.” *Id.*, [0047], [0051].

Once the mobile device receives the transaction information, it may “append[] the payment information to the transaction information received from the unattended retail device 102” and then “[t]he combined information is . . . encrypted and sent to the merchant processor 108.” *Id.*, [0027]. After issuing an authorization, the “merchant processor 108 sends the authorization to the mobile appliance 104, which forwards the authorization to the unattended retail device 102.” *Id.*, [0028]. The communications between the unattended retail device 102, mobile appliance 104, and merchant processor 108 are summarized in Fig. 1 below:

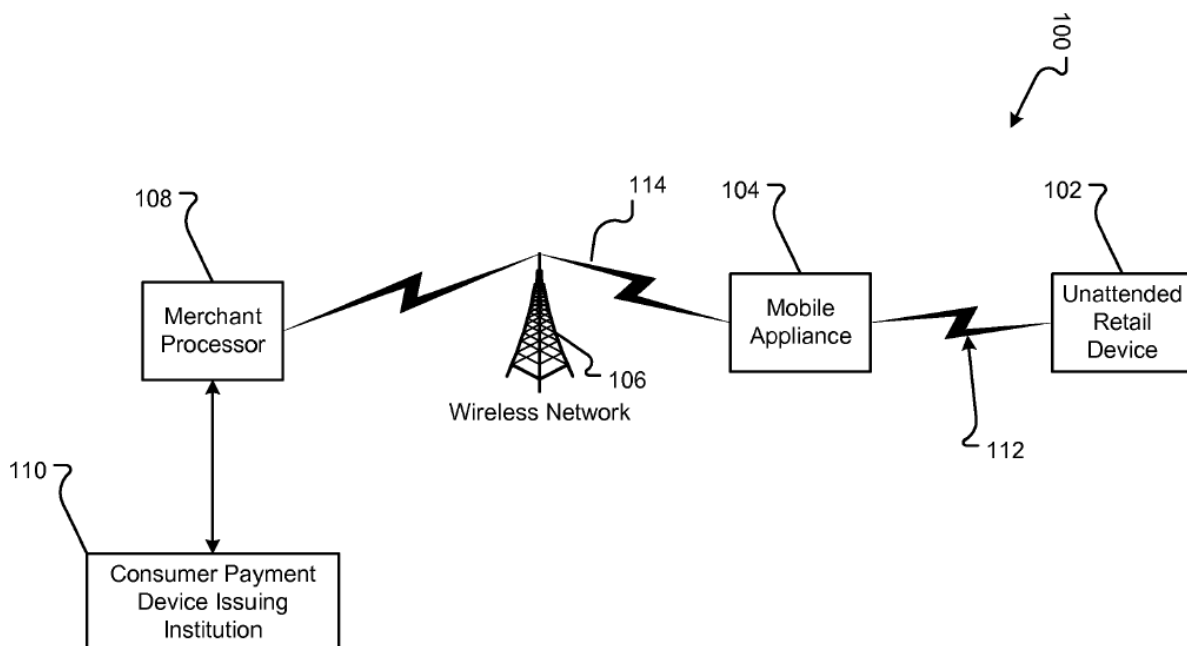


Fig. 1

3. Reasons to Combine Low and Skowronek

For the reasons set forth below, a POSITA would have been motivated to combine the teachings of Low with those of Skowronek. It would have been obvious, beneficial, and predictable for Low’s electronic payment system to use message encryption techniques, as taught by Skowronek. Ex.1003, ¶54. Implementing these features of Skowronek would have improved the security of the payment information transmitted between the electronic payment module of the vending machine, the user device, and the payment provider and vendor servers in Low. Ex.1003, ¶56.

As an initial matter, when considering the teachings of Low, a POSITA would have also considered the teachings of Skowronek. Both Low and Skowronek relate to electronic payment using a mobile device with machines which dispense goods or services. *See* Ex.1004, 1:16-19 (“The present application generally relates to . . . wireless electronic payments to non-Internet connected machines through user devices.”); Ex.1005, [0001] (“This invention relates, in general, to . . . contactless payments for a retail service that an unattended retail device provides.”). In particular, both describe in detail methods to communicate payment requests and authorizations between a machine (such as a vending machine) and a mobile device, and between a mobile device and a remote server or processor. Ex.1004, 2:38-46, 4:45-56, 5:61-6:9, 7:40-50, 9:39-62, 10:55-61, 12:20-21; Ex.1005, [0022]-[0026]. As such, both Low

and Skowronek are analogous art to the '045 patent. *Compare* Ex.1004, 1:16-19; Ex.1005, [0001], *with* '045 patent, 3:38-41; Ex.1003, ¶¶50-51.

Low recognizes the need for security features in communications between the various devices, and teaches that the payment authorization sent from the server to the user device, and then from the user device to the vending machine, may be encrypted. Ex.1004, 8:3-21, 12:9-19, 10:62-11:8, claims 1, 7, 12. Low, however, describes the encryption only at a high level without significant detail about the encryption of the messages.

As such, a POSITA starting with Low would look to Skowronek for more detailed teachings about how encryption of messages transmitted between a retail device, mobile device, and external servers would be implemented. *See* Ex.1005, [0027]-[0030], [0047], [0051], Figs. 2A-2B; Ex.1003, ¶¶55-56. Skowronek teaches several encryption techniques which a POSITA would have recognized would improve a similar system—the Low system—in the same way, to improve the security of the communications. Ex.1003, ¶56. For example, Skowronek teaches various encryption methods, including symmetrical or asymmetrical encryption, public key encryption, and pretty-good-privacy (PGP)—all known techniques which a POSITA would have understood to be suitable options for mobile-payment-to-machine systems. Ex.1005, [0036], [0040]; Ex. 1003, ¶57. Likewise, Skowronek teaches that the encrypted information may be unreadable to the mobile device in

order to prevent “tampering.” *Id.*, [0026]. A POSITA would have also understood that this technique would prevent “tampering” in Low’s similar system. Ex.1003, ¶59.

Included in Skowronek’s teachings is the idea that the payment authorization *request* (as opposed to just the payment authorization *grant*), which includes both the transaction information and payment information (such as credit or debit card accounts), may be encrypted to secure the transaction and payment information included in the request. *Id.*, [0026] (“[T]he packet of transaction information is encrypted for transmission.”). Ex.1003, ¶58.

A POSITA starting with Low would have understood that Low’s payment authorization requests contain the same types of transaction and payment information that Skowronek encrypts. *Compare* Ex.1005, [0026]-[0027], *with* Ex.1004, 10:34-40, 9:24-31, 10:18-26; Ex.1003, ¶58. As such, a POSITA would have naturally been motivated to apply Skowronek’s teachings of encrypting the same such information to Low. Ex.1003, ¶58.

Not only would using Skowronek’s encryption methods be advantageous, but a POSITA would have had a reasonable expectation of success in making the combination. Ex.1003, ¶60. Skowronek’s encryption techniques were specifically meant to improve systems to facilitate electronic payment on machines—the same

type of system identified by Low—and thus a POSITA would have naturally expected success. *Id.*

Further, any modification of Low’s teachings, including the encryption of the payment authorization request, would have been within the level of ordinary skill in the art. Ex.1003, ¶61. Low already contemplates that the POSITA would have been familiar with encryption techniques, as it already teaches the use of encryption for payment authorization grant communications between devices. Ex.1004, 8:3-21, 12:9-19, 10:62-11:8, claims 1, 7, 12; Ex.1003, ¶61. Accordingly, it would have been within the background knowledge and standard capabilities of a POSITA to expand the use of encryption in Low to encrypt the payment authorization request, expand the encryption methods used, and render the encrypted information undecipherable to the mobile device. Ex.1003, ¶61.

Accordingly, the combination of Low and Skowronek represents applying known techniques (encryption methods) to a known device ready for improvement (Low’s system for electronic payment on a machine) to yield predictable results (improving security of the information transmitted, including that transmitted in the payment authorization request). Ex.1003, ¶62.

4. Claim 2

[2] The system of claim 1, said adapter module having security technology and said server having security technology,

First, Low discloses that the electronic payment module (“*adapter module*”) has security technology. For example, the electronic payment module of the vending machine has technology to decrypt the payment authorization. Ex.1004, 10:62-11:8 (“Electronic payment module may then **decrypt** the authorization message received from user device 110 using a public key and dispense the product.”). The machine 120 “may include an encryption key, such as a public key of an asymmetric key pair” to decrypt the message. *Id.*, 9:39-62; Ex.1003, ¶¶122-23.

Second, the vendor server (part of the “*server*”) has security technology to encrypt communications to the machine. For example, “Vendor server 150 may include data and/or processes corresponding to vending machine 120, for example, an **encrypted** message corresponding to dispensing of a purchased item from products 124 or other desired information.” Ex.1004, 8:3-21; *see also* 10:62-11:8 (“The authorization message may be encrypted, for example, by a private key of vendor server 150.”); 12:9-19, claims 1, 7, 12; Ex.1003, ¶124.

[2.i] said authorization request being secured by said adapter module security technology to create a secured authorization request,

First, as described above in [1(c)], Low discloses that the electronic payment module (“*adapter module*”) contains a “payment verification application” which may “correspond to processes, procedures, and/or applications executable by a hardware processor, for example, a software program.” Ex.1004, 5:61-6:9. The

payment verification application may transmit a “purchase request” (“*authorization request*”) to the user device. *Id.*, 5:66-6:3; 2:38-46; Ex.1003, ¶¶125-26.

Second, a POSITA would have found it obvious for the adaptor module to secure the purchase request (“*secured authorization request*”), as taught by Skowronek. Ex.1003, ¶¶127-28. Skowronek teaches that an unattended retail device 102 (“*payment accepting unit*”) compiles transaction information into a packet of information, said information including “the good or service requested, the amount of payment required, an identifier for the unattended retail device 102, an identifier for the merchant that needs to approve the transaction, instructions for the mobile appliance 104 to contact the merchant processor, and/or one or more other items of information.” Ex.1005, [0026]. Said packet of transaction information is sent to the mobile appliance 104 (“*mobile device*”). *Id.* The packet of transaction information may be encrypted (“*secured*”) for transmission to the mobile appliance. *Id.* (“[T]he packet of transaction information is **encrypted** for transmission.”). Ex.1003, ¶128.

This is consistent with the definition of “security technology” described in the ‘045 patent specification and the description of security features of the adapter module, which include “encryption/decryption technology.” Ex.1001, 4:6-21, 14:53-65, 17:19-24. The ‘045 specification uses the words “encrypted” and “secured” interchangeably. *See* Ex.1001, 12:24-26. Ex.1003, ¶129.

For at least the reasons explained above at Sec. X.D.3, a POSITA would have been motivated to implement Skowronek’s teaching of encrypting the purchase request in Low’s system. Ex.1003, ¶127.

[2.ii] said authorization grant being secured by said server security technology to create a secured authorization grant, and

As explained above in [1(d)], Low discloses that the vendor server 150 (part of the “server”) sends a payment authorization (“*authorization grant*”) to the user device. As explained above in [2], the vendor server 150 includes security technology to encrypt the payment authorization to create a *secured authorization grant*. Ex.1004, 10:62-11:8 (“The authorization message may be encrypted, for example, by a private key of vendor server 150.”); *see also* 8:3-21, 9:39-62, 12:9-19, claims 1, 7, 12; Ex.1003, ¶¶130-31.

[2.iii] said secured authorization request and said secured authorization grant being undecipherable to the mobile device.

First, as described above in [2], Low discloses that the vendor server encrypts the payment authorization, which is then transmitted to the user device and then transmitted to the electronic payment module (“*adapter module*”) where it is decrypted. Ex.1004, 8:3-21, 9:39-62, 10:62-11:8, 12:9-19. As such, a POSITA would have understood this to mean that the payment authorization is not decrypted by—and is therefore undecipherable to—the user device, as the user device is not

described as having a decryption key and the decryption is not described to occur until receipt by the electronic payment module. Ex.1003, ¶¶132-34.

Second, a POSITA would have found it obvious to make Low’s payment request (“*authorization request*”) and payment authorization (“*authorization grant*”) undecipherable to the user device as taught by Skowronek. Skowronek teaches that details of the transaction “are encrypted and cannot be decrypted by the mobile appliance 200,” and as such “the transaction details 306 are preserved without tampering[.]”³ Ex.1005, [0047]; *see also* [0051]; [0074] (“The authorization message may remain encrypted while being forwarded through the mobile application 206....”); [0078]; Ex.1003, ¶¶135-37.

For at least the reasons explained above at Sec. X.D.3, a POSITA would have been motivated to implement Skowronek’s teaching of making the purchase request and purchase authorization undecipherable to the user device. Ex.1003, ¶135.

5. Claim 3

[3] The system of claim 1, said adapter module and said server sharing a unique private key,

³ Petitioner notes that its proposed combination does not rely on the “alternative embodiments” of Skowronek in which portions of the transaction details may be unencrypted and available to the mobile device. *See, e.g.*, Ex.1005, [0047].

First, Low discloses that the electronic payment module of the vending machine may use “a public key of an asymmetric key pair” to decrypt the authorization message that was encrypted using a “private key of vendor server 150.” Ex.1004, 9:39-62; 10:63-11:8; *see also* claims 1, 7, 12.Ex.1003, ¶¶138-39.

Second, to the extent this limitation requires symmetrical encryption (wherein the same unique private key is shared between the adapter module and server), a POSITA would have found it obvious to use symmetric encryption in Low, as taught by Skowronek. Ex.1003, ¶¶140-41. Skowronek discloses that the encryption module 226 of the unattended retail device 202 (“*payment accepting unit*”) may “use any encryption method, such as, **symmetrical** or asymmetrical encryption[.]” Ex.1005, [0036]. Likewise, the encryption module 238 of the merchant processor 222 (“*server*”) may also use “any encryption method, such as, **symmetrical** or asymmetrical encryption[.]” *Id.*, [0040]. And a POSITA would have understood that symmetrical encryption uses the same shared unique private key. Ex.1003, ¶141.

For at least the reasons explained above at Sec. X.D.3, a POSITA would have been motivated to implement Skowronek’s teaching of symmetrical encryption in Low. Ex.1003, ¶140.

[3.i] said adapter module having encryption/decryption technology and said server having encryption/decryption technology,

First, Low discloses the electronic payment module (“*adapter module*”) including “an encryption key, such as a public key of an asymmetric key pair, to decrypt [an] encrypted message.” Ex.1004, 9:39-62; 10:63-11:8. Because the electronic payment module has the ability to decrypt messages, it has “*encryption/decryption technology*”. Ex.1003, ¶¶142-43.

Second, Low discloses that the vendor server (part of “*said server*”), is able to encrypt the payment authorization. *Id.*, 8:3-21, 9:39-62, 10:62-11:8, 12:9-19, claims 1, 7, 12. As such, it also has “*encryption/decryption technology*.” Ex.1003, ¶144.

Third, Skowronek discloses that the vending machine’s encryption module may use symmetrical encryption/decryption, the merchant processor may use symmetrical encryption/decryption, and a POSITA would have been motivated to combine this symmetrical “*encryption/decryption technology*” of Skowronek with Low as explained in Sec. X.D.3. *See* [3]; Ex.1003, ¶¶145-46.

[3.ii] *said authorization request being encrypted by said adapter module encryption/decryption technology using said unique private key to create an encrypted authorization request,*

See [2.i], [3]. Ex.1003, ¶147.

[3.iii] *said encrypted authorization request being decrypted by said server encryption/decryption technology using said unique private key,*

See [2.i], [3]. Ex.1003, ¶148.

[3.iv] said authorization grant being encrypted by said server encryption/decryption technology using said unique private key to create an encrypted authorization grant,

See [3], [3.i]. Ex.1003, ¶149.

[3.v] said encrypted authorization grant being decrypted by said adapter module encryption/decryption technology using said unique private key, and

See [3], [3.i]. Ex.1003, ¶150.

[3.vi] said encrypted authorization request and said encrypted authorization grant being undecipherable to the mobile device.

See [2.iii]. Ex.1003, ¶151.

6. Claim 19

[19] The method of claim 18, securing said authorization request using security technology associated with said adapter module to create a secured authorization request,

See [2.i]. Ex.1003, ¶152.

[19.i] securing said authorization grant using security technology associated with said server to create a secured authorization grant

See [1(d)], [2.ii]. Ex.1003, ¶153.

[19.ii] said secured authorization request and said secured authorization grant being undecipherable to the mobile device.

See [2.iii]. Ex.1003, ¶154.

7. Claim 20

[20] The method of claim 18, sharing a unique private key between said adapter module and said server,

See [3]. Ex.1003, ¶155.

[20.i] encrypting using said unique private key said authorization request using encryption/decryption technology associated with said adapter module to create an encrypted authorization request,

See [2.i], [3], [3.i]. Ex.1003, ¶156.

[20.ii] decrypting using said unique private key said encrypted authorization request using encryption/decryption technology associated with said server,

See [2.i], [3], [3.i]. Ex.1003, ¶157.

[20.iii] encrypting using said unique private key said authorization grant using said encryption/decryption technology associated with said server to create an encrypted authorization grant,

See [3], [3.i]. Ex.1003, ¶158.

[20.iv] decrypting using said unique private key said encrypted authorization grant using encryption/decryption technology associated with said adapter module,

See [3], [3.i]. Ex.1003, ¶159.

[20.v] said encrypted authorization request and said encrypted authorization grant being undecipherable to the mobile device.

See [2.iii]. Ex.1003, ¶160.

E. Ground 3: Claims 4-6 and 21-23 are obvious under 35 U.S.C. § 103 over Low in view of Freeny

1. Summary of Low

See Sec. X.C.1. Ex.1003, ¶¶36-40.

2. Summary of Freeny

Freeny relates to a “proximity service unit for providing at least one predetermined service for use with multiple types of wireless devices.” Ex.1006, Abstract. Like the “payment accepting unit” in the ‘045 patent, a “proximity service unit” is “any device which provides a predetermined service upon activation” including toll systems, public transportation systems, ATMs, store checkout systems, and vending machines. Ex.1006, 31:34-42, 2:8-25, 15:13-21. In Freeny’s system, “the proximity service unit 2920 communicates with the proximity authorization unit 2910 via either a wireless link 2912 or in some cases a physical link 2917.” *Id.*, 31:43-49. The wireless link is “preferably a low power wireless link which does not typically communicate farther than about 300 feet.” *Id.*

In use, the machine may be automatically activated when the user enters a certain area. *See id.*, 32:49-55 (“[T]he vending machine system can be activated either automatically or manually by the proximity authorization unit 2910 when the person is within a predetermined proximity distance.”). In some embodiments, steps may be executed when the user’s mobile device is within two predetermined

distances from the machine—a “first proximity distance” and a “second proximity distance.” *Id.*, 33:18-36. At the first proximity distance, the authorization process for use of the machine is commenced. *Id.* (“The authorization process using the authorization request codes transmitted to the wireless adapter element 3180 of the proximity service unit 2920 from the proximity authorization unit 2910 can be activated for example at a first proximity distance.”). At the closer second proximity distance, the transaction may be approved. *Id.*, (“The store checkout system can approv[e] the transaction at a second proximity distance (which is closer than the first proximity distance)[.]”) The transactions completed based on the mobile device’s proximity to the machine may be “automatic.” *Id.*, 33:37–53, *see also* 13:2-37.

3. Reasons to Combine Low and Freeny

For the reasons set forth below, a POSITA would have been motivated to combine the teachings of Low with those of Freeny. It would have been obvious, beneficial, and predictable for Low’s electronic payment system to use proximity-based transmission of authentication and payment information, as taught by Freeny. Ex.1003, ¶63. Implementing these features of Freeny would have made Low’s electronic payment system more convenient to the user, as it would reduce the number of interactions the user must have with the user device to complete the transaction. *Id.*

As an initial matter, when considering the teachings of Low, a POSITA would have also considered the teachings of Freeny. Both Low and Freeny relate to electronic payment using a mobile device with machines which dispense goods or services. *See* Ex.1004, 1:16-19 (“The present application generally relates to . . . wireless electronic payments to non-Internet connected machines through user devices.”); Ex.1006, 33:37-53 (explanation of mobile payment authorization for payment service units), *see also* 7:60-67, 35:60-36:5, 37:58-67. In particular, both describe methods to communicate information between a machine (such as a vending machine) and a mobile device. Ex.1004, 2:38-46, 4:45-56, 5:61-6:9, 7:40-50, 9:39-62, 10:55-61, 12:20-21; Ex.1006, 7:60-67, 33:37-53, 35:60-36:5, 37:58-67. As such, both Low and Freeny are analogous art to the ‘045 patent. *Compare* Ex.1004, 1:16-19; Ex.1006, Abstract, *with* ‘045 patent, 3:38-41; Ex.1003, ¶¶50, 52.

A POSITA starting with Low would have looked to Freeny for its teaching on proximity-based transactions. Low discloses the benefit of user convenience, stating that the user’s device application may transmit approvals and/or purchase authorizations in order to “dispens[e] the purchased product at a convenient time.” *Id.*, 4:3-13. Low’s claims 1, 7, and 12 also disclose monitoring the user’s proximity to the machine, requiring: “based at least in part on the location, identification of the plurality of non-Internet connected machines within a distance to the user device.” Ex.1004, claims 1, 7, 12. Thus, because Low touts the importance of user

convenience, and because Low already discloses that machines are identified based on the proximity of the user device, a POSITA would have been motivated to implement Freeny's proximity-based transactions in Low's system. Ex.1003, ¶¶64-65.

For example, Low presumes that a POSITA would have understood that the user's mobile device would have been able to track the proximity between the device and the non-Internet connected machine. *See id.* Using this capability, a POSITA would have been able to set up a first proximity distance (in which to initiate payment authorization) and a second proximity distance (in which to initiate payment), as taught by Freeny. *See* Ex.1006, 2:8-25, 13:23-37, 32:49-55, 33:18-36; Ex.1003, ¶65.

Low also teaches that the user's device may "automatically connect or pair with 'accepted' machines." Ex.1004, 11:30-35. Using this capability, a POSITA would have been able to set up "hands-free" payment, as taught by Freeny, where authorization and payment would take place automatically at the first and second proximity distances—without requiring user interaction with the user device. Ex.1006, 13:2-37, 33:37-53; Ex.1003, ¶¶66-68.

Not only would using Freeny's proximity-based transactions in Low be convenient for the user, a POSITA would have had a reasonable expectation of success in making the combination. Ex.1003, ¶67. Freeny's proximity-based methods were specifically meant to improve systems to facilitate electronic payment

on machines—the same type of system identified by Low—and thus a POSITA would have naturally expected success. Ex.1003, ¶67.

Further, any modification of Low’s teachings, including the use of proximity of the user device to the machine to trigger authorization and payment, would have been within the level of ordinary skill in the art. Ex.1003, ¶68. Low already contemplates that the POSITA would have been able to identify the location of the user device and its proximity to the non-Internet connected machines. Ex.1004, claims 1, 7, 12; Ex.1003, ¶68. Accordingly, it would have been within the background knowledge and standard capabilities of a POSITA to expand the use of location data in Low to trigger authorization and payment upon arrival at certain proximities to the non-Internet connected machines. Ex.1003, ¶68. Likewise, since Low describes automatic pairing of user devices to certain non-Internet connected machines, it would have been within the background knowledge and standard capabilities of a POSITA to make those proximity-based transmissions automatic, as in Freeny. Ex.1004, 11:30-35; Ex.1003, ¶68.

Accordingly, the combination of Low and Freeny represents applying known techniques (proximity-based transmissions) to a known device ready for improvement (Low’s system for electronic payment on a machine) to yield predictable results (improving user convenience by reducing the number of

interactions the consumer must have with the user device to complete the transaction). Ex.1003, ¶69.

4. Claim 4

[4(a)] The system of claim 1 further comprising: (a) said adapter module surrounded by two zones, a payment zone and an authorization zone,

First, Low discloses that a transaction may take place when the user device 110 (“*mobile device*”) is in communication range of the adapter module. Ex.1004, 9:63-67. The communication range is the range in which the user’s device can connect to the adapter module using Bluetooth or other short-range communication technologies. Ex.1004, 4:45-56, 9:63-67, 10:18-40; Ex.1003, ¶¶161-62.

Second, a POSITA would have found it obvious to surround Low’s electronic payment module (“*adapter module*”) with two separate zones (“*a payment zone and an authorization zone*”), as taught by Freeny. Ex.1003, ¶164. Freeny describes a system for payment using a “proximity authorization unit” (a mobile device) at a “proximity service unit”—a machine such as a vending machine, ATM system, or store checkout system. *See* Ex.1006, 2:8-25. The proximity service unit has a wireless adapter element 3180 which communicates with the mobile device. Ex.1006, 33:18-36. The wireless adapter element transmits authorization for a mobile payment when the mobile device is within a “first proximity distance” (“*authorization zone*”) from the proximity service unit. Ex.1006, 33:18-36; *see also*

2:8-25, 13:23-37, 32:49-55. The transaction is then approved when the mobile device is at a “second proximity distance” (“*payment zone*”) which is closer than the first proximity distance. *Id*; Ex.1003, ¶¶165-66.

For at least the reasons explained above at Sec. X.E.3, a POSITA would have been motivated to implement Freeny’s teaching of authorization and payment zones. Ex.1003, ¶163.

[4(a.i)] wherein said payment zone is within said authorization zone;

A POSITA would have found it obvious to make the payment zone within the authorization zone, as taught by Freeny. Ex.1003, ¶¶167-68. Freeny teaches a “second proximity distance” (“*payment zone*”) between the “proximity authorization unit” (“*mobile device*”) and the “proximity service unit” (“*payment accepting unit*”) is closer than the “first proximity distance” (“*authorization zone*”). Ex.1006, 33:18-36. Because the radius of the second proximity distance is shorter than the radius of the first proximity distance, the second proximity distance (“*payment zone*”) is *within* the first proximity distance (“*authorization zone*”). Ex.1003, ¶169.

For at least the reasons explained above at Sec. X.E.3, a POSITA would have been motivated to implement Freeny’s teaching of the payment zone being within the authorization zone. Ex.1003, ¶168.

[4(b)] said adapter module sending said authorization request when the mobile device is within said authorization zone; and

First, Low discloses the electronic payment module (“*adapter module*”) sending an authorization request to the user’s mobile device. *See* [1(c)]. Ex.1003, ¶¶170-71.

Second, A POSITA would have found it obvious to send the authorization request when the mobile device is within the “first proximity distance” (“*authorization zone*”), as taught by Freeny. Ex.1003, ¶173. Freeny teaches that the authorization request codes (“*authorization request*”) are transmitted when the proximity authorization unit (“*mobile device*”) is within the first proximity distance (“*authorization zone*”). Ex.1006, 33:18-36, 13:23-37; Ex.1003, ¶173.

For at least the reasons explained above at Sec. X.E.3, a POSITA would have been motivated to implement Freeny’s teaching of sending a transmission when a mobile device is within a certain proximity to Low’s transmission of authorization requests from the electronic payment module. Ex.1003, ¶172.

[4(c)] the mobile device forwarding said authorization grant for funds to said adapter module when the mobile device is within said payment zone.

First, Low discloses the user device (“*mobile device*”) forwarding the purchase authorization to the electronic payment module (“*adapter module*”). *See* [1(d)]. Ex.1003, ¶¶174-75.

Second, A POSITA would have found it obvious to send the purchase authorization when the mobile device is within the “second proximity distance”

(“*payment zone*”). Ex.1003, ¶177. Freeny teaches that transaction is approved (“*authorization grant for funds*”) when the mobile device is at the second proximity distance (“*payment zone*”). Ex.1006, 33:18-36 (“The store checkout system can approval the transaction at a second proximity distance . . .”), 13:23-37.

For at least the reasons explained above at Sec. X.E.3, a POSITA would have been motivated to apply Freeny’s teaching of sending a transmission when a mobile device is within a certain proximity to the machine to Low’s transmission of the authorization grant for funds. Ex.1003, ¶176.

5. Claim 5

[5(a)] The system of claim 1 further comprising: (a) said adapter module surrounded by three zones, a payment zone, an authorization zone, and a communication zone,

First, as discussed above for [4(a)], Low and Freeny render obvious “*said adapter module surrounded by two zones, a payment zone and an authorization zone*” as claimed. Ex.1003, ¶¶178-80.

Second, the claimed “*communication zone*” is inherent in Low’s disclosure. Low describes that the user device may store a purchase approval and “redeem the approval when user device 110 is in **communication range** of vending machine 110.” Ex.1004, 9:62-67. In Low, the communication range of the vending machine is the range of the short-range communication technology (*e.g.*, Bluetooth) which the user device uses to communicate with the vending machine. *See id.*, 6:9-16, *see*

also 4:57-5:3. Likewise, the ‘045 patent describes the “communication zone” as “Bluetooth range.” Ex.1001, 6:21-25, 21:66-22:6, FIG. 1; Ex.1003, ¶181.

[5(a.i)] wherein said payment zone is within said authorization zone and said authorization zone is within said communication zone;

First, as discussed above for [4(a.i)], Freeny renders obvious the “*payment zone is within said authorization zone.*” Ex.1003, ¶¶182-83.

Second, the authorization zone being within the communication zone is inherent from the disclosure in Low. Ex.1003, ¶184. As described above for [5(a)], the *communication zone* is inherent from Low’s description of the communication range (*i.e.* Bluetooth range) between the user device and vending machine. Ex.1003, ¶184. As described above for [1(c)], the authorization request is sent from the adapter module to the user device using short-range communication technology which defines the “communication range.” Ex.1004, 4:45-56. As such, to initiate authorization of the transaction while the user is in the authorization zone, the authorization zone *must* be within the “communication range” (“*communication zone*”). Ex.1003, ¶184.

[5(b)] the mobile device receiving advertising broadcast signals from said adapter module within said communication zone;

Low discloses that vending machine may send advertising broadcast signals to the user device (“*user device*”), stating: “the NICM, the payment provider, and/or

the operator of the machine may send product details to the user device to upsell or **advertise** products available on the NICM.” Ex.1004, 2:20-25. Since these advertisements are sent to the user device via “wireless communication, such as Bluetooth or NFC (Near Field Communication) means,” the user device *must* be within the communication zone, as described above for [5(a.i)]. *Id.*, 2:11-16; Ex.1003, ¶¶185-86.

[5(c)] said adapter module sending said authorization request when the mobile device is within said authorization zone; and

See [4(b)]. Ex.1003, ¶187.

[5(d)] the mobile device forwarding said authorization grant for funds to said adapter module when the mobile device is within said payment zone.

See [4(c)]. Ex.1003, ¶188.

6. Claim 6

[6] The system of claim 1 having a hands-free mode in which the payment accepting unit dispenses the at least one product or service without the user interacting with the mobile device.

First, as discussed above for [1(e)], Low discloses that the vending machine 120 (“*payment accepting unit*”) dispenses a product or service. *See* [1(e)]; Ex.1004, 5:19-35, 9:39-62, 10:55-61, 12:9-19, 12:9-19. The user selects the product or service at the beginning of the transaction, but the product or service is *dispensed* once the vending machine receives payment authorization from the user device—not based

on further the user interaction with the mobile device. *Id.*, 9:39-62 (“After vending machine 120 receives a payment authorization, vending machine 120 may dispense the purchased item of products 124.”); Ex.1003, ¶¶189-90.

Second, to the extent that claim 6 requires the product or service to be dispensed without user interaction with the mobile device during the entire transaction, a POSITA would have found it obvious to modify Low’s vending machine to do so as taught by Freeny. Ex.1003, ¶¶191-92. Freeny discloses that authorization information can be stored such that the proximity authorization unit 2910 (“*mobile device*”) can “automatically sense and determine the required signal type and/or protocol to be sent to one of the proximity service units 2920” and thus complete a payment without user interaction with the mobile device. Ex.1006, 33:37-53; *see also* 13:2-37 (describing hands-free operation of a “predetermined toll service”); Ex.1003, ¶192. As noted, Freeny discloses that this automatic hands-free operation would be particularly applicable for toll booths. Ex. 1006, 32:31-38. This is consistent with the ‘045 patent, which explains that the payment accepting unit may be a toll booth in addition to a vending machine. Ex.1001, 1:31-38, 12:55-60. And Freeny discloses that its proximity service unit may be a vending machine in addition to a toll booth system, Ex. 1006, 31:34-42, which would have further motivated a POSITA to apply it to Low’s vending machines. Ex.1003, ¶193.

For at least the reasons explained above and at Sec. X.E.3, a POSITA would have been motivated to apply Freeny's teaching of automatic hands-free activation of payment to Low's vending machines. Ex.1003, ¶191.

7. Claim 21

[21(a)] The method of claim 18 further comprising: (a) surrounding said adapter module with two zones, a payment zone and an authorization zone,

See [4(a)]. Ex.1003, ¶194.

[21(a.i)] wherein said payment zone is within said authorization zone;

See [4(a.i)]. Ex.1003, ¶195.

[21(b)] said adapter module sending said authorization request when the mobile device is within said authorization zone; and

See [4(b)]. Ex.1003, ¶196.

[21(c)] the mobile device forwarding said authorization grant for funds to said adapter module when the mobile device is within said payment zone.

See [4(c)]. Ex.1003, ¶197.

8. Claim 22

[22(a)] The method of claim 18 further comprising: (a) surrounding said adapter module with three zones, a payment zone, an authorization zone, and a communication zone,

See [5(a)]. Ex.1003, ¶198.

[22(a.i)] wherein said payment zone is within said authorization zone and said authorization zone is within said communication zone;

See [5(a.i)]. Ex.1003, ¶199.

[22(b)] the mobile device receiving advertising broadcast signals from said adapter module within said communication zone;

See [5(b)]. Ex.1003, ¶200.

[22(c)] said adapter module sending said authorization request when the mobile device is within said authorization zone; and

See [4(b)]. Ex.1003, ¶201.

22(d) the mobile device forwarding said authorization grant for funds to said adapter module when the mobile device is within said payment zone.

See [4(c)]. Ex.1003, ¶202.

9. Claim 23

[23] The method of claim 18 having a hands-free mode in which the payment accepting unit dispenses the at least one product or service without the user interacting with the mobile device.

See [6]. Ex.1003, ¶203.

F. Ground 4: Claims 10-14 are obvious under 35 U.S.C. § 103 over Low in view of Skowronek and Freeny

1. Summary of Low

See Sec. X.C.1. Ex.1003, ¶¶36-40.

2. Summary of Skowronek

See Sec. X.D.2. Ex.1003, ¶¶41-44.

3. Summary of Freeny

See Sec. X.E.2. Ex.1003, ¶¶45-46.

4. Reasons to Combine Low and Skowronek and Freeny

See Secs. X.D.3, X.E.3. Ex.1003, ¶¶54-69.

5. Claim 10

[10(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,

See [1(pre)]. Ex.1003, ¶204.

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

See [1(pre.i)]. Ex.1003, ¶205.

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

See [1(pre.ii)]. Ex.1003, ¶206.

[10(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,

See [1(a)]. Ex.1003, ¶207.

[10(a.i)] said adapter module having security technology

See [2]. Ex. 1003, ¶208.

[10(a.ii)] said adapter module surrounded by two zones, a payment zone and an authorization zone,

See [4(a)]. Ex.1003, ¶209.

[10(a.iii)] wherein said payment zone is within said authorization zone;

See [4(a.i)]. Ex.1003, ¶210.

[10(b)] a server having long-range communication technology for communicating with the long-range communication technology of the mobile device,

See [1(b)]. Ex.1003, ¶211.

[10(b.i)] said server having security technology;

See [2]. Ex.1003, ¶212.

[10(c)] said adapter module for sending a secured authorization request for funds secured by said adapter module security technology to the mobile device using short-range communication technology when the mobile device is within said authorization zone,

First, as described above in [4(b)], Freeny discloses the “*adapter module sending said authorization request when the mobile device is within said authorization zone.*” Ex.1003, ¶¶213-14.

Second, as described above in [1(a)] and [1(c)], Low discloses an adapter module having short-range communication technology for communicating with the short-range communication technology of the mobile device. Ex.1004, 4:57-5:3, 6:9-16. The payment verification application of the adapter module may transmit a “purchase request” (“*authorization request for funds*”) to the user device including “a product name, product price, product code, a machine identifier, and/or a transaction number to user device 110.” *Id.*, 5:66-6:3; 2:38-46; Ex.1003, ¶215.

Third, a POSITA would have found it obvious for the adapter module to secure the purchase request (“*secured authorization request for funds by said adapter module security technology*”), as taught by Skowronek. *See* [2(i)]. Ex.1003, ¶216.

[10(c.i)] the mobile device forwarding said secured authorization request for funds to said server using long-range communication technology;

First, as described above in [1(c)], Low discloses that after the purchase request (“*authorization request for funds*”) is received by the user device, it is transmitted (“*forward[ed]*”) to payment provider server 140 via long-range communication technology. *Id.*, 5:61-6:9, 7:40-50; Ex.1003, ¶¶217-18.

Second, as described above in [2(i)], a POSITA would have found it obvious for the purchase request to be secured by encryption (“*secured authorization request for funds*”), as taught by Skowronek. Skowronek teaches that an unattended retail device 102 (“*payment accepting unit*”) compiles transaction information into a packet of information and secures said information through encryption for transmission to the mobile appliance (“*mobile device*”). Ex.1005, [0026]; Ex.1003, ¶219.

[10(d)] said server for sending a secured authorization grant for funds secured by said server security technology to the mobile device using long-range communication technology,

See [1(d)], [2(ii)]. Ex.1003, ¶220.

[10(d.i)] the mobile device forwarding said secured authorization grant for funds to said adapter module using short-range communication technology when the mobile device is within said payment zone;

See [1(d)], [4(c)]. Ex.1003, ¶221.

[10(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 secured authorization grant.

See [1(e)]. Ex.1003, ¶222.

6. Claim 11

[11] The system of claim 10, said secured authorization grant being undecipherable to the mobile device.

See [2.iii]. Ex.1003, ¶223.

7. Claim 12

[12] The system of claim 10, said adapter module and said server sharing a unique private key,

See [3]. Ex.1003, ¶224.

[12.i] said adapter module security technology being encryption/decryption technology and said server security technology being encryption/decryption technology,

See [3.i]. Ex.1003, ¶225.

[12.ii] said secured authorization request being encrypted by said adapter module encryption/decryption technology using said unique private key to create an encrypted secured authorization request,

See [2.i], [3], [3.ii]. Ex.1003, ¶226.

[12.iii] said encrypted secured authorization request being decrypted by said server encryption/decryption technology using said unique private key,

See [2.i], [3], [3.iii]. Ex.1003, ¶227.

[12.iv] said secured authorization grant being encrypted by said server encryption/decryption technology using said unique private key to create an encrypted secured authorization grant,

See [3], [3.i], [3.iv]. Ex.1003, ¶228.

[12.v] said encrypted secured authorization grant being decrypted by said adapter module encryption/decryption technology using said unique private key, and

See [3], [3.i], [3.v]. Ex.1003, ¶229.

[12.vi] said encrypted secured authorization request and said encrypted secured authorization grant being undecipherable to the mobile device.

See [2.iii], [3.vi]. Ex.1003, ¶230.

8. Claim 13

[13(a)] The system of claim 10 further comprising: (a) said adapter module being surrounded by three zones, said payment zone, said authorization zone, and a communication zone,

See [5(a)]. Ex.1003, ¶231.

[13(a.i)] wherein said authorization zone is within said communication zone; and

See [5(a.i)]. Ex.1003, ¶232.

[13(b)] the mobile device receiving advertising broadcast signals from said adapter module within said communication zone.

See [5(b)]. Ex.1003, ¶233.

9. Claim 14

[14] The system of claim 10 having a hands-free mode in which the payment accepting unit dispenses the at least one product or service without the user interacting with the mobile device.

See [6]. Ex.1003, ¶234.

G. Ground 5: Claims 8-9 and 25-26 are obvious under 35 U.S.C. § 103 over Low in view of Wilson

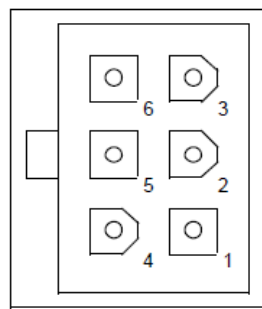
1. Summary of Low

See Sec. X.C.1. Ex.1003, ¶¶36-40.

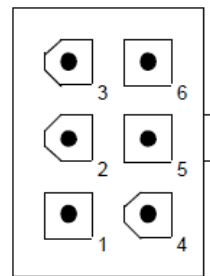
2. Summary of Wilson

Like the ‘045 patent, Wilson relates to “systems, methods, and apparatuses for cashless vending.” Ex.1007, 1:7-10. In particular, Wilson discloses a vending machine with an interface (NetVend) that connects to a Vending Machine Controller (VMC) through its Multi-Drop Bus interface. *Id.*, 2:28-43. The NetVend interface communicates with a central server via a wireless link, and “the linked connection can be any known or later developed connection system or structure usable to connect the NetVend interface 114 to the central server 160, including both wired and wireless connections.” *Id.*, 4:38-58.

Wilson relies on the publication titled “Multi-Drop Bus / Internal Communication Protocol,” Version 3.0 (“MDB/ICP Specification,” Ex.1008), published by the National Automatic Merchandising Association on March 26, 2003. *See* Ex.1008; Ex.1007, 2:38, 4:26-31, 7:11-14, 7:27-35. The Wilson specification states that the NetVend interface is analogous to “Cashless Device #1” in the MDB/ICP Specification. *Id.* The “Cashless Device” is an adapter which enables mobile payments on the vending machine and communicates via the MDB/ICP interface. *Id.* The MDB/ICP Specification discloses details as to Wilson’s NetVend Multi-Drop Bus interface, including the shape of the Peripheral and VMC/MDB Connectors, which feature female (socket) and male (pin) connections:



Peripheral Connector
Face View
Receptacle
(Sockets)



VMC / Bus Connector
Face View
Header
(Pins)

Ex.1008, 7.

3. Reasons to Combine Low and Wilson

For the reasons set forth below, a POSITA would have been motivated to combine the teachings of Low with those of Wilson. It would have been obvious, beneficial, and predictable for Low’s electronic payment module to use a Multi-Drop Bus (MDB) interface, as taught by Wilson. Ex.1003, ¶70. The use of an electronic payment module that is an in-line dongle with an MDB interface having male and female adaptors as taught in Wilson would be an obvious option, as Low does not describe how to attach the electronic payment module to the vending machine. *Id.*

As an initial matter, when considering the teachings of Low, a POSITA would have also considered the teachings of Wilson. Ex.1003, ¶50. Both Low and Wilson relate to electronic payment with machines which dispense goods. *See* Ex.1004, 1:16-19 (“The present application generally relates to . . . wireless electronic payments to non-Internet connected machines through user devices.”); Ex.1007, 1:7-10 (“This invention relates generally to systems, methods, and apparatuses for cashless vending.”); Ex.1003, ¶50. In particular, both describe a vending machine including a module to communicate with external devices to complete payments. Ex.1004, 5:10-18, 5:44-53, 6:9-31; Ex.1007, 2:32-43, 4:20-58. As such, both Low and Wilson are analogous art to the ‘045 patent. *Compare* Ex.1004, 1:16-19; Ex.1007, 1:7-10, *with* ‘045 patent, 3:38-41; Ex.1003, ¶¶50, 53.

Low includes an electronic payment module, a physical hardware component of the vending machine which communicates with external devices via a wireless connection. Ex.1007, 5:14-17, 5:49-53. Low, however, does not describe how the electronic payment module is integrated into the vending machine. As such, a POSITA starting with Low would look to Wilson for teachings about how to connect the electronic payment module to the vending machine, including the ability to retrofit an existing machine with the capability to accept electronic payments, how to make the electronic payment module an in-line dongle for insertion within the MDB, and how to connect the MDB and electronic payment module with a male and a female adapter. *See* Ex.1007, 4:15-58; Ex.1008, 7-8; Ex.1003, ¶¶70-71. These modifications would be beneficial as they would have helped a POSITA use the electronic payment module on an existing machine by connecting through the existing Multi-Drop Bus, rather than requiring an entirely new machine. Ex.1003, ¶72. A POSITA would have also looked to Wilson for other beneficial modifications for user convenience—such as the idea that a user’s available funds to make a purchase could be displayed on the vending machine’s display based on information in the payment authorization. Ex.1003, ¶73.

A POSITA starting with Low would have understood that its vending machines could be retrofitted with electronic payment modules which interface with the Multi-Drop Bus like those in Wilson. Ex. 1003, ¶71. As is outlined in the ‘045

patent specification, “[m]ost vending machines made since 1995 have this industry standard MDB technology” and it would have been known in the art to “include interfaces to communicate with external peripherals through the MDB protocol.” Ex.1001, 2:52-61, 9:60-62; Ex. 1003, ¶72. A POSITA would therefore have naturally been motivated to apply Wilson’s teachings of using industry standard MDB technology in Low. *Id.*

A POSITA would have had a reasonable expectation of success in making the combination between Low’s electronic payment module and Wilson’s MDB-based interface. Ex.1003, ¶74. Wilson’s MDB interface is specifically meant to improve systems to facilitate electronic payment on machines—the same type of system identified by Low—and thus a POSITA would have naturally expected success. *Id.*

The combination of Low and Wilson represents applying known techniques (an MDB interface) to a known device ready for improvement (Low’s system for electronic payment on a machine) to yield predictable results (a communication link between the vending machine and external devices). Ex.1003, ¶75.

4. Claim 8

[8] The system of claim 1 wherein said adapter module is an in-line dongle for in-line insertion within a multi-drop bus of the payment accepting unit.

As explained above in [1(a)], Low discloses a vending machine (“*payment accepting unit*”) with an electronic payment module (“*adapter module*”). Ex.1004,

4:64-67, 5:14-17, 5:49-53. Wilson discloses a NetVend cashless interface (“*in-line dongle*”) for a vending machine, which communicates via a Multi-Drop Bus (MDB) standard interface to the vending machine (“*payment accepting unit*”) controller. Ex.1007, 2:34-43 (“[E]ach vending machine contains a vending machine interface, known as NetVend, which connects to the VMC through its **MDB interface.**”), Abstract, 2:28-33, 4:15-25, 7:3-14. The interface is a “retrofitted piece of equipment on the vending machine.” *Id.*, 4:20-25; Ex.1003, ¶¶235-38.

For at least the reasons explained above at Sec. X.G.4, a POSITA would have been motivated to implement Wilson’s teaching of the adapter module being an in-line dongle adapted to connect through the MDB interface in Low. Ex.1003, ¶237.

5. Claim 9

[9(a)] The system of claim 1: (a) the payment accepting unit having a multi-drop bus to a payment receiving mechanism,

First, as explained above for [8], a POSITA would have found it obvious to make the adapter module connect through the MDB interface as taught by Wilson, in Low. Ex.1003, ¶¶239-40.

Second, Wilson’s NetVend interface uses the MDB/ICP Specification, which describes communication between a vending machine (“*payment accepting unit*”) controller and a cashless device (“*payment receiving mechanism*”) such as a card-based or mobile-phone based system:

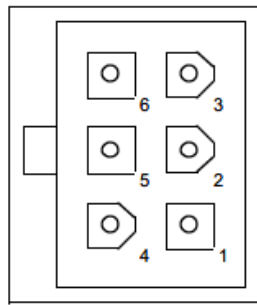
This section defines the communications bytes sent and received between the cashless device(s) and the Vending Machine Controller (VMC). As defined in Section 2.3, there are two cashless device addresses; Cashless #1, 00010xxxB (10H) and Cashless #2, 1100xxxB (60H). The second address has been assigned to allow for two unique forms of cashless devices to be resident in the vending machine simultaneously. An example would be a card based system as Cashless Device #1 (10H) and a mobile phone based system as Cashless Device #2 (60H). **Everything defined in this section will be common to the two cashless devices – only the addresses will be different.**

Ex.1008, 94; Ex.1003, ¶242.

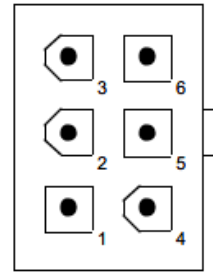
For at least the reasons explained above at Sec. X.H.5, a POSITA would have been motivated to implement Wilson’s teaching of connecting the MDB to a cashless device mechanism. Ex.1003, ¶241.

[9(a.i)] the multi-drop bus having a male adapter and a female adapter;

Wilson describes using a standard Multi-Drop Bus interface in accordance with the MDB/ICP Specification. *See* [8]; *see also* Ex.1007, 2:34-43, 4:26-31. As taught by the MDB/ICP Specification used by Wilson, the standard interface includes peripheral connectors having pins and sockets (“*male and female adapter[s]*”) as depicted below:



Peripheral Connector
Face View
Receptacle
(Sockets)



VMC / Bus Connector
Face View
Header
(Pins)

Ex.1008, 7.

These standard MDB male and female connectors used by Wilson from the MDB/ICP Specification are the same as those used by the embodiments of the '045 Patent:

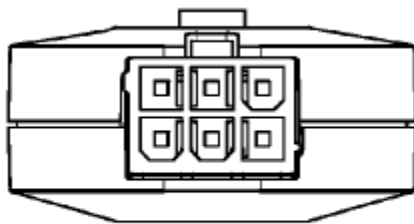


FIG. 15

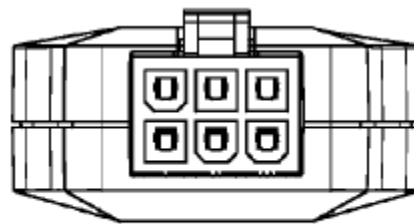


FIG. 16

Ex.1001, Figs. 15-16; Ex.1003, ¶¶243-45.

For at least the reasons explained above at Sec. X.G.3, a POSITA would have been motivated to implement Wilson's MDB configuration, including male and female adapters for the MDB, in Low. Ex.1003, ¶246.

[9(b)] said adapter module having a male adapter and a female adapter; and

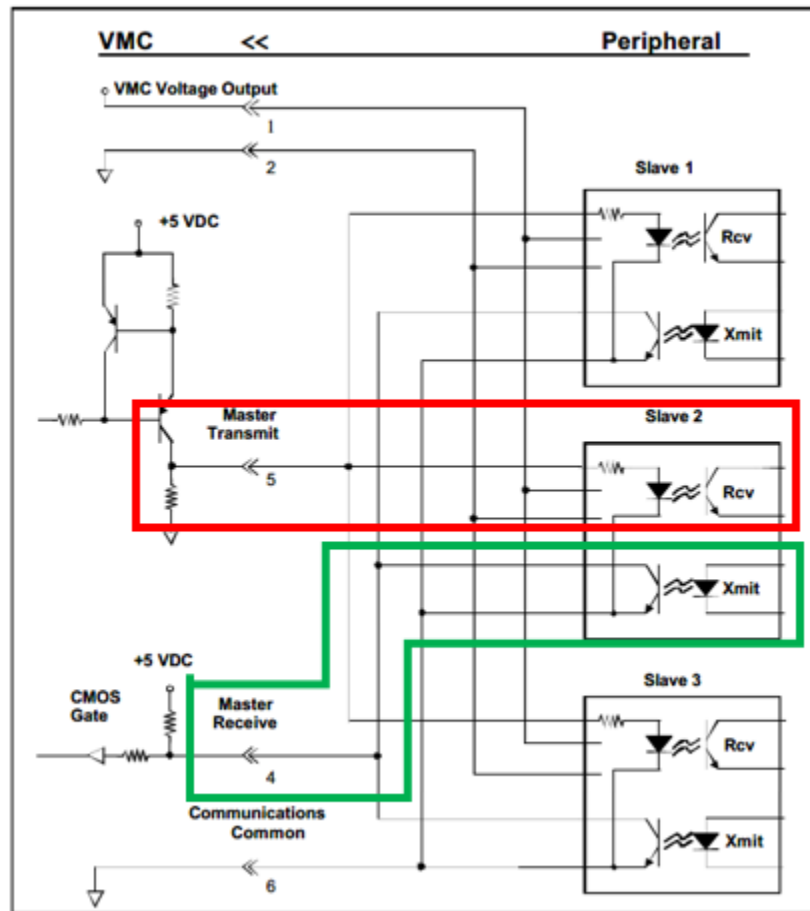
Wilson inherently discloses this limitation. As described above for [9(a.i)], Wilson describes a Standard MDB interface in accordance with the MDB/ICP Specification, wherein the MDB has male and female adapters. Ex.1007, 2:34-43, 4:26-31; Ex.1008, 52. Wilson’s NetVend cashless interface (“*adapter module*”) is expressly designed to connect with this standard MDB interface (Ex.1007, 2:34-43, 4:26-31), so it must have a corresponding male and female adapter to attach to the MDB interface. Ex.1003, ¶¶247-48.

For at least the reasons explained above at Sec. X.G.3, a POSITA would have been motivated to implement Wilson’s adapter module configuration. Ex.1003, ¶249.

[9(c)] said adapter module insertable in serial with the multi-drop bus by connecting said male adapter of said adapter module to the female adapter of the multi-drop bus and by connecting said female adapter of said adapter module to the male adapter of the multi-drop bus.

As discussed above in [8] and [9(a)], Wilson describes the NetVend cashless interface (“*adapter module*”) as connecting to a standard MDB interface as described in the MDB/ICP Specification. Ex.1007, 2:34-43, 4:26-31. The MDB/ICP Specification describes a “serial bus interface,” which allows a Vending Machine Controller (VMC) to control peripheral devices electronically. Ex.1008, 18. The standard MDB interface peripheral connectors (adapters of the “*adapter module*”) are described as “intermateable” (“*insertable*”) in serial with the MDB by

connecting the corresponding “transmit” and “receive” lines of the VMC/Bus and Peripheral connectors (“male and female adapter[s]”). *Id.*, 47, 52-53. A Schematic of these connections is shown below:



Id., 8 (annotated). As described above for [9(b)], the adapter module having male and female adapters to connect with the male and female adapters of the MDB is inherently disclosed in Wilson, as Wilson’s adapter module connects to the MDB having those standard adapters. Ex.1003, ¶250-52.

For at least the reasons explained above at Sec. X.G.3, a POSITA would have been motivated to implement Wilson's adapter module configuration in Low. Ex.1003, ¶253.

6. Claim 25

[25] The method of claim 18 further comprising the step of inserting said adapter module as an in-line dongle for in-line insertion within a multi-drop bus of the payment accepting unit.

See [8]. Ex.1003, ¶254.

7. Claim 26

[26] The method of claim 18, the payment accepting unit having a multi-drop bus to a payment receiving mechanism,

See [9(a)]. Ex.1003, ¶255.

[26.i] the multi-drop bus having a male adapter and a female adapter, and

See [9(a.i)]. Ex.1003, ¶256.

[26.ii] said adapter module having a male adapter and a female adapter,

See [9(b)]. Ex.1003, ¶257.

[26.iii] said method further comprising the step of inserting said adapter module in serial with the multi-drop bus by connecting said male adapter of said adapter

module to the female adapter of the multi-drop bus and by connecting said female adapter of said adapter module to the male adapter of the multi-drop bus.

See [9(c)]. Ex.1003, ¶258.

H. Ground 6: Claims 7 and 24 are obvious under 35 U.S.C. § 103 over Low in view of Freeny and Wilson

1. Summary of Low

See X.C.1. Ex.1003, ¶¶36-40.

2. Summary of Freeny

See X.E.2. Ex.1003, ¶¶45-46.

3. Summary of Wilson

See X.G.2. Ex.1003, ¶¶47-49.

4. Reasons to Combine Low and Freeny

See X.E.3. Ex.1003, ¶¶63-69.

5. Reasons to Combine Low and Wilson

See X.G.3. Ex.1003, ¶¶70-75.

6. Claim 7

[7] The system of claim 1 having a hands-free mode in which the payment accepting unit dispenses the at least one product or service without the user interacting with the mobile device, said system further comprising:

See [6]. Ex.1003, ¶259.

[7(a)] a display of the payment accepting unit for displaying funds available based on information from said authorization grant; and

First, Low discloses that the vending machine (“*payment accepting unit*”) includes “a product payment and dispensing module . . . for a user to make selections, purchase, and dispense products 124” which may include “means to select a product, such as using a keypad, touchscreen, **display**, or other selection means.” Ex.1004, 5:19-35, 6:64-67. Ex.1003, ¶¶260-61.

Second, a POSITA would have found it obvious for Low’s display to display the funds available based on information from the payment authorization (“*authorization grant*”), as taught by Wilson. Ex.1003, ¶263. Wilson discloses a cashless vending machine (“*payment accepting unit*”) which has a “user interface known as the **display**/reader.” Ex.1007, 2:52-56. The vending machine has a “NetVend interface,” which “communicates with at least one central server” to authenticate (“*authorize*”) a transaction. *Id.*, Abstract, 3:4-19, 9:66-10:11. The central server performing the authentication “contains a database for storing user Identifiers and an associated **allowable credit or available cash data** for each user Identifier[.]” *Id.*, Abstract, *see also* 3:4-19, 9:66-10:11. Based on the user’s information, the central server “either grants or denies the user access to the vending machine 110” (“*authorization grant*”). *Id.*, 5:39-42. Once users are granted access (“*authorization grant*”), they are “shown their available credit/cash on the display/reader 116” of the vending machine. *Id.*, 5:43-45; Ex.1003, ¶¶263-64.

For at least the reasons explained above at Sec. X.G.3, 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. Ex.1003, ¶262.

[7(b)] input mechanisms of the payment accepting unit for receiving user selection input when the user interacts with the input mechanisms to select the at least one product or service to be dispensed.

See [1(e)], 1[pre]. Ex.1003, ¶265.

7. Claim 24

[24] The method of claim 18 having a hands-free mode in which the payment accepting unit dispenses the at least one product or service without the user interacting with the mobile device, said method further comprising the steps of:

See [6]. Ex.1003, ¶266.

[24(a)] displaying funds available on a display of the payment accepting unit, said funds available being based on information from said authorization grant; and

See [7(a)]. Ex.1003, ¶267.

[24(b)] receiving user selection input when the user interacts with input mechanisms of the payment accepting unit to select the at least one product or service to be dispensed.

See [1(e)], [7(b)]. Ex.1003, ¶268.

I. Ground 7: Claims 15-17 are obvious under 35 U.S.C. § 103 over Low in view of Skowronek, Freeny, and Wilson

1. Summary of Low

See X.C.1. Ex.1003, ¶¶36-40.

2. Summary of Skowronek

See X.D.2. Ex.1003, ¶¶41-44.

3. Summary of Freeny

See X.E.2. Ex.1003, ¶¶45-46.

4. Summary of Wilson

See X.G.2. Ex.1003, ¶¶47-49.

5. Reasons to Combine Low and Skowronek

See X.D.3. Ex.1003, ¶¶54-62.

6. Reasons to Combine Low and Freeny

See X.E.3. Ex.1003, ¶¶63-69.

7. Reasons to Combine Low and Wilson

See X.G.3. Ex.1003, ¶¶70-75.

8. Claim 15

[15] The system of claim 10 having a hands-free mode in which the payment accepting unit dispenses the at least one product or service without the user interacting with the mobile device, said system further comprising:

See [6]. Ex.1003, ¶269.

[15(a)] a display of the payment accepting unit for displaying funds available based on information from said secured authorization grant; and

See [7(a)]. Ex.1003, ¶270.

[15(b)] input mechanisms of the payment accepting unit for receiving user selection input when the user interacts with the input mechanisms to select the at least one product or service to be dispensed.

See [1(e)], [1(pre)], [7(b)]. Ex.1003, ¶271.

9. Claim 16

[16] The system of claim 10 wherein said adapter module is an in-line dongle for in-line insertion within a multi-drop bus of the payment accepting unit.

See [8]. Ex.1003, ¶272.

10. Claim 17

[17(a)] The system of claim 10: (a) the payment accepting unit having a multi-drop bus to a payment receiving mechanism,

See [9(a)]. Ex.1003, ¶273.

[17(a.i)] the multi-drop bus having a male adapter and a female adapter;

See [9(a.i)]. Ex.1003, ¶274.

[17(b)] said adapter module having a male adapter and a female adapter;

See [9(b)]. Ex.1003, ¶275.

[17(c)] said adapter module insertable in serial with the multi-drop bus by connecting said male adapter of said adapter module to the female adapter of the multi-drop bus and by connecting said female adapter of said adapter module to the male adapter of the multi-drop bus.

See [9(c)]. Ex.1003, ¶276.

XI. CONCLUSION

Petitioner respectfully requests that the Challenged Claims be cancelled.

Respectfully submitted,

Dated: July 17, 2023
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Customer No. 27683

/Jason R. Mudd/
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Lead Counsel for Petitioner
Reg. No. 57,700

XII. MANDATORY NOTICES

A. Real Party-in-Interest

Pursuant to 37 C.F.R. § 42.8(b)(1), Petitioner certifies that it is the real party-in-interest.

B. Related Matters

Pursuant to 37 C.F.R. § 42.8(b)(2), to the best knowledge of the Petitioner, the '045 patent is or was involved in the following cases:

Case Heading	Number	Venue	Filed
<i>PayRange, Inc. v. CSC ServiceWorks, Inc.</i>	1:23-cv-00278	D. Del.	Mar. 15, 2023
<i>PayRange, Inc. v. CSC ServiceWorks, Inc.</i>	1:22-cv-00502	D. Del.	Apr. 19, 2022

C. Lead and Back-up Counsel and Service Information

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Please address all correspondence in this proceeding to lead and back-up counsel. Petitioner consents to service in this proceeding by email at the addresses above.

CERTIFICATE OF WORD COUNT

Pursuant to 37 C.F.R. § 42.24(d), Petitioner hereby certifies, in accordance with and reliance on the word count provided by the word-processing system used to prepare this Petition, that the number of words in this paper is 13,997. Pursuant to 37 C.F.R. § 42.24(d), this word count excludes the table of contents, table of authorities, mandatory notices under § 42.8, certificate of service, certificate of word count, appendix of exhibits, and any claim listing.

Dated: July 17, 2023

/Jason R. Mudd/

Jason R. Mudd
Lead Counsel for Petitioner
Reg. No. 57,700

CERTIFICATE OF SERVICE

The undersigned certifies that, in accordance with 37 C.F.R. § 42.6(e) and 37 C.F.R. § 42.105, service was made on Patent Owner as detailed below.

<i>Date of service</i>	July 17, 2023
<i>Manner of service</i>	FEDERAL EXPRESS
<i>Documents served</i>	Petition for <i>Inter Partes</i> Review Under 35 U.S.C. § 312 and 37 C.F.R. § 42.104 of U.S. 8,856,045; Petitioner's Exhibit List; and Exhibits 1001-1012.
<i>Persons served</i>	Morgan, Lewis & Bockius LLP 1400 Page Mill Road Palo Alto, CA 94304

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