

UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE PATENT TRIAL AND APPEAL BOARD

SQUARE, INC.,
Petitioner,

v.

4361423 CANADA INC.,
Patent Owner.

IPR2019-01653
Patent 9,818,107 B2

Before JAMESON LEE, ROBERT J. WEINSCHENK, and
KEVIN C. TROCK, *Administrative Patent Judges*.

TROCK, *Administrative Patent Judge*.

JUDGMENT
Final Written Decision
Determining All Challenged Claims Unpatentable
35 U.S.C. § 318(a)

I. INTRODUCTION

We have authority to hear this *inter partes* review under 35 U.S.C. § 6. This Final Written Decision issues pursuant to 35 U.S.C. § 318(a) and 37 C.F.R. § 42.73. For the reasons discussed herein, we determine that Square, Inc. (“Petitioner”) has shown by a preponderance of the evidence that claims 1–7 and 22–28 (the “challenged claims”) of U.S. Patent No. 9,818,107 B2 (Ex. 1001, “the ’107 patent”) are unpatentable. *See* 35 U.S.C. § 316(e); 37 C.F.R. § 42.1(d) (2019).

A. *Procedural History*

Petitioner filed a Petition, Paper 2 (“Pet.” or “Petition”), to institute an *inter partes* review of the challenged claims of the ’107 patent. 4361423 Canada, Inc. (“Patent Owner”) filed a Preliminary Response. Paper 8 (“Prelim. Resp.”). We instituted *inter partes* review on all challenged claims on the grounds presented in the Petition. Paper 9 (“Institution Decision” or “Dec.”).

After institution, Patent Owner filed a Response to the Petition. Paper 18 (“PO Resp.”). Petitioner thereafter filed a Reply to Patent Owner’s Response. Paper 23 (“Pet. Reply”). Patent Owner filed a Sur-reply to Petitioner’s Reply. Paper 25 (“PO Sur-reply”). An oral hearing was held on February 10, 2021. A transcript of the hearing is included in the record. Paper 32 (“Tr.”).

B. Related Proceedings

According to the parties, the '107 patent is the subject of the following action: *4361423 Canada Inc. v. Square, Inc.*, 4:19-cv-04311-JSW (N.D. Cal.) filed July 26, 2019. Pet. 1; Paper 4, 2.

Petitioner notes one other petition (IPR2019-01654) filed by Petitioner against the '107 patent. Pet. 2. Petitioner also lists petitions it has filed against other family members of the '107 patent (IPR2019-01625 and IPR2019-01626 (U.S. Patent No. 8,286,875 B2); IPR2019-01627 and IPR2019-01628 (U.S. Patent No. 8,281,998 B2); IPR2019-01629 and IPR2019-01630 (U.S. Patent No. 9,269,084 B2) IPR2019-01649 (U.S. Patent No. 9,016,566 B2); IPR2019-01650 (U.S. Patent No. 9,311,637 B2); IPR2019-01651 (U.S. Patent No. 9,443,239 B2); IPR2019-01652 (U.S. Patent No. 9,613,351 B2)). Pet. 2.

C. The '107 Patent (Ex. 1001)

The '107 patent describes commercial transactions using a transaction card via a communication device in audio communication with a remote processor assembly. Ex. 1001, 2:31–34. Figure 1 of the '107 patent is shown below.

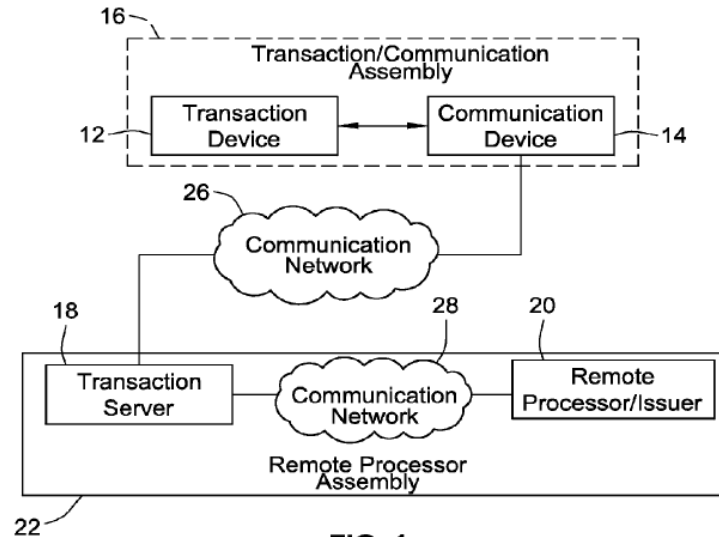


FIG. 1

Figure 1, above, shows a diagram of a transaction network including a transaction device 12 and communication device 14 which together form a transaction and communication assembly 16. *Id.* at 7:10–13. “The transaction apparatus 12 captures transaction data and, in some implementations, provides a user with feedback.” *Id.* at 7:13–15. Transaction server 18 and a remote processor/issuer 20 together form a remote processor assembly 22. *Id.* at 7:15–17.

The ’107 patent describes the operation of the system as follows:

The transaction apparatus 12 captures information from the transaction card and converts this information into an audio signal. The audio signal is transmitted to the communication device 14 for transmission to the transaction server 18 via a communication network 26 (e.g. Internet, GSM/GPRS network). At the transaction server 18, the audio signal is converted into a digital signal and transmitted to the remoter processor/issuer 20 via a communication or payment network 28 (e.g. Internet, Visa-Net, BankNet). The remoter processor/issuer 20 validates this request by accepting or denying the request and sends this validation information to the transaction server 18 which then converts this digital signal into an audio signal and transmits it

back to the assembly 16 providing the seller and buyer with a confirmation or a rejection message. As such, the communication device 12 acts as a receiver of the transaction data in analog audio format and also as a conduit to transmit the transaction data to a transaction server 18 via the communication network 26.

Id. at 7:19–37.

Figure 2 of the '107 patent is shown below.

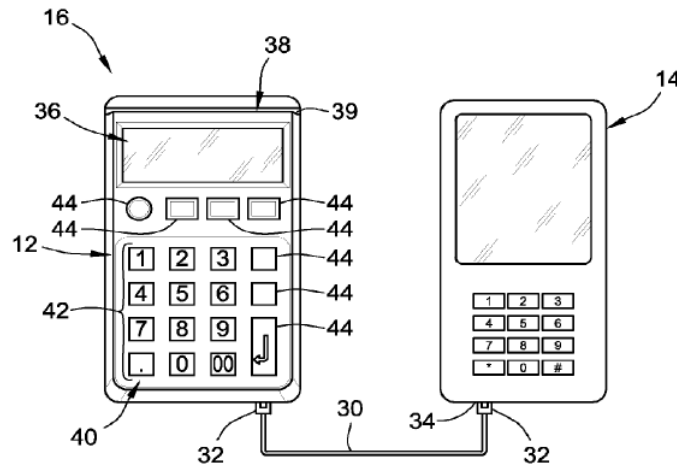


FIG. 2

Figure 2, above, depicts a transaction and communication assembly 16 including a portable transaction apparatus 12 in the form of a point of sale (POS) device linked to a communication device in the form of mobile phone via a communication link in the form of a cable 30. *Id.* at 7:38–43. The POS device 12 includes a display screen 36 and an input device 38 such as card reader slot 39 for swiping or inserting a transaction card and capturing information therefrom. *Id.* at 7:47–54. The POS device 12 can also include an additional input device 40 in the form of a control pad including a PIN pad 42, and other control buttons 44 allowing the user to enter transaction information which is also captured by the POS device 12 and converted into an audio signal for transmission to the communication device 14. *Id.* at 7:54–60.

Figure 5 of the '107 patent is reproduced below.

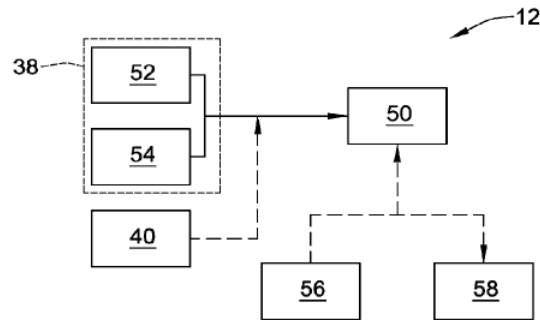


FIG. 5

Figure 5, above, is a diagram depicting transaction device 12 which includes a controller 50 in the form of a microcontroller unit (MCU). *Id.* at 7:63–65. The input device 38 can be in the form of an analog signal reader 52 such as a magnetic stripe reader and/or a digital signal reader 54 such as an Integrated Circuit (IC) or Smart Card or EMV reader. *Id.* at 7:65–8:1.

D. Challenged Claims

Petitioner challenges claims 1–7 and 22–28 of the '107 patent. Pet. 1. Claims 1 and 22 of the challenged claims are independent, and are essentially similar, however claim 1 is directed to an apparatus and claim 22 is directed to a method. Claim 1 is illustrative.

1. [Preamble] An apparatus for effecting commercial transactions between an input device and a remote transaction server using a communication device, said apparatus comprising:
 - [1.A] an input device for capturing recorded information from a transaction card;
 - [1.B.1] a sensor incorporated into said input device for reading said recorded information stored on said transaction card,
 - [1.B.2] said sensor including circuitry for reading an analog signal;
 - [1.C] a controller coupled to said sensor for converting the recorded information stored on said transaction card into a format suitable for transmission to a communication device; and
 - [1.D] a communication link for coupling said controller to a communication device for the transmission of said recorded information therebetween;

- [1.E.1] wherein the said sensor reads the recorded information stored on said transaction card,
- [1.E.2] said controller converts said recorded information read by said sensor into a format suitable for transmission to said communication device and
- [1.E.3] transmits said recorded information via the communication link to said communication device, and
- [1.E.4] said communication device transmits said recorded information to a remote transaction server for processing a commercial transaction.

Ex. 1001, 12:10–34 (numbering and formatting designated by Petitioner; *see* Ex. 1002, 1).

E. Evidence

Petitioner relies upon the following evidence:

- (1) U.S. Patent No. 6,234,389 B1, issued May 22, 2001 (“Valliani”) (Ex. 1005);
- (2) U.S. Patent Publication No. 2005/0236480 A1, published October 27, 2005 (“Vrotsos”) (Ex. 1006);
- (3) U.S. Patent Publication No. 2002/0091633 A1, published July 11, 2002 (“Proctor”) (Ex. 1008);
- (4) U.S. Patent Publication No. 2004/0012875 A1, published January 22, 2004 (“Wood”) (Ex. 1009);
- (5) U.S. Patent No. 6,278,779 B1, issued August 21, 2001 (“Bryant”) (Ex. 1010);
- (6) U.S. Patent No. 6,144,336, issued November 7, 2000 (“Preston”) (Ex. 1011); and
- (7) Declaration and Rebuttal Declaration of Michael Shamos, Ph.D. (Exs. 1003, 1017).

Patent Owner relies on the Declaration of Mr. Ivan Zatkovich (Ex.

2004).

F. Asserted Grounds of Unpatentability

Claims Challenged	35 U.S.C. §	References
1–6, 22–27	103	Valliani/Vrotsos
7, 28	103	Valliani/Vrotsos/Bryant
1–6, 22–27	103	Proctor/Vrotsos
7, 28	103	Proctor/Vrotsos/Bryant

II. ANALYSIS

A. Level of Ordinary Skill

In determining whether an invention would have been obvious at the time it was made, we consider the level of ordinary skill in the pertinent art at the time of the invention. *Graham v. John Deere Co.*, 383 U.S. 1 (1966). “The importance of resolving the level of ordinary skill in the art lies in the necessity of maintaining objectivity in the obviousness inquiry.” *Ryko Mfg. Co. v. Nu-Star, Inc.*, 950 F.2d 714, 718 (Fed. Cir. 1991).

Petitioner describes a person of ordinary skill in the art as a person having “a Bachelor of Science Electrical Engineering, Computer Science, or an analogous field, or equivalent experience, and at least two years of relevant experience and familiarity with the fields of embedded system implementation, mobile communications, electronic payments and encryption.” Pet. 15 (citing Ex. 1003 ¶¶ 17–24). Petitioner’s declarant, Dr. Shamos, testifies that a person of ordinary skill in the art “would have

had bachelor's degree in electrical engineering, computer science, or an analogous field, or equivalent experience, and at least two years of relevant experience and familiarity with embedded system implementation, mobile communications, electronic payments and encryption.” Ex. 1003 ¶ 24.

Patent Owner's expert, Mr. Zatkovich, agrees with Dr. Shamos that a person of ordinary skill in the art “in the field of the challenged claims would have been someone with good working knowledge of device interfaces and the integration of devices involving digital and analog signals. Ex. 2004 ¶ 14. Mr. Zatkovich testifies that a person of ordinary skill in the art “may have a Bachelor of Science in Electrical Engineering or Computer Engineering, or the equivalent and have at least one to two years of relevant experience in the fields of embedded systems and mobile communication device interfaces, or otherwise equivalent industry experience in the relevant field.” *Id.*

The parties' description of a person of ordinary skill is essentially the same and is consistent with the subject matter of the '107 patent. We agree with the parties' description of a person of ordinary skill in the art at the time of the claimed invention, with the exception of the qualifier “at least” to keep the description from extending to a level beyond that of ordinary skill. Accordingly, for purposes of this Final Written Decision, a person of ordinary skill in the art is a person with a bachelor's degree in electrical or computer engineering or equivalent having two years of relevant experience in the fields of embedded systems and mobile communication device interfaces, or otherwise equivalent industry experience in the field.

B. Claim Construction

In an *inter partes* review, we apply the same claim construction standard that would be used in a civil action under 35 U.S.C. § 282(b), following the standard articulated in *Phillips v. AWH Corp.*, 415 F.3d 1303 (Fed. Cir. 2005) (en banc). 37 C.F.R. § 42.100(b) (2019). In applying such standard, claim terms are generally given their ordinary and customary meaning, as would be understood by a person of ordinary skill in the art, at the time of the invention and in the context of the entire patent disclosure. *Phillips*, 415 F.3d at 1312–13. “In determining the meaning of the disputed claim limitation, we look principally to the intrinsic evidence of record, examining the claim language itself, the written description, and the prosecution history, if in evidence.” *DePuy Spine, Inc. v. Medtronic Sofamor Danek, Inc.*, 469 F.3d 1005, 1014 (Fed. Cir. 2006) (citing *Phillips*, 415 F.3d at 1312–17).

Only terms that are in controversy need to be construed, and then only to the extent necessary to resolve the controversy. *Nidec Motor Corp. v. Zhongshan Broad Ocean Motor Co. Matal*, 868 F.3d 1013, 1017 (Fed. Cir. 2017); see *Vivid Techs., Inc. v. Am. Sci. & Eng’g, Inc.*, 200 F.3d 795, 803 (Fed. Cir. 1999) (applying *Vivid Techs.* in the context of an *inter partes* review).

Here, neither party proposes an express construction for any claim terms. We agree that no claim terms require express construction, and use the ordinary and customary meaning of the terms. However, to the extent that the arguments of the parties reflect a particular understanding of the claim language, we discuss each party’s understanding in our analysis of the arguments below.

C. Patentability Challenges

As noted above, Petitioner presents four grounds challenging the patentability of particular claims of the '107 patent under 35 U.S.C. §103. The first two grounds rely principally on Valliani in combination with Vrotsos or Vrotsos and Bryant, while the last two grounds rely principally on Proctor in combination with Vrotsos or Vrotsos and Bryant.

1. Principles of Law on Obviousness

Section 103(a) forbids issuance of a patent when “the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains.” In *Graham*, the Supreme Court set out a framework for applying the statutory language of Section 103: the scope and content of the prior art are to be determined; differences between the prior art and the claims at issue are to be ascertained; and the level of ordinary skill in the pertinent art resolved. *Graham*, 383 U.S. at 17–18.

The Supreme Court has made clear that we apply “an expansive and flexible approach” to the question of obviousness. *KSR Int’l Co. v. Teleflex, Inc.*, 550 U.S. 398, 415 (2007). Whether a patent claiming the combination of prior art elements would have been obvious is determined by whether the improvement is more than the predictable use of prior art elements according to their established functions. *KSR*, 550 U.S. at 417. Reaching this conclusion, however, requires more than a mere showing that the prior art includes separate references covering each separate limitation in a claim under examination. *Unigene Labs., Inc. v. Apotex, Inc.*, 655 F.3d 1352, 1360 (Fed. Cir. 2011). Rather, obviousness requires the additional showing that a person of ordinary skill at the time of the invention would have

stored on at least one magnetic stripe (or track) 220 on a credit card (or other card) 230.” *Id.* at 4:38–42. “Module 200 may provide a pinpad unit 240, a printer unit 245, a fingerprint reader unit 250, a signature capture unit and/or virtual pinpad unit 255, and/or a smartcard reader unit 260.” *Id.* at 4:42–45. “Smartcard reader unit 260 is utilized if card 230 is a smartcard storing data in memory 225.” *Id.* at 4:45–47. Using wireless unit 65 and/or serial and/or parallel ports 70, device 10 can communicate with remote host system 75 using an internal modem. *Id.* at 4:13–21. “Software-memory within circuitry 240 encrypts user-input PIN data and, using device 10 as an interface [35] terminal, causes such encrypted data to be sent by device 10 to a host system 75.” *Id.* at 6:33–36.

ii. Vrotsos (Ex. 1006)

Vrotsos describes “[a]n attachment that may be coupled to a wireless communication device, such as a cellular telephone, personal digital assistant (PDA), or the like, to perform commercial or other information transactions” as illustrated in Figure 10 below. Ex. 1006, Abst.

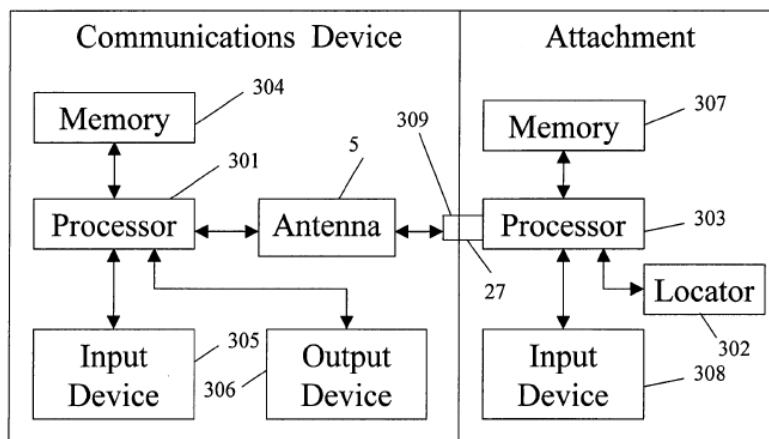


FIGURE
10

Vrotsos's Figure 10, above, is a block diagram that illustrates components of the wireless communication device and the attachment. *Id.* ¶ 24.

Vrotsos discloses that “the system may be used to transmit credit card information during a point-of-sale transaction, transmit fingerprint information during a traffic stop, transmit bar code information during a tour of a warehousing facility or retail location, or the like.” *Id.* ¶ 26. The attachment 21 may include one or more input devices, such as a magnetic stripe reader, a smartcard reader, a fingerprint scanner, an optical scanner, a signature pad, an alphanumeric keypad (such as, a PIN pad), a proximity detector, an audio recording device, or a camera (such as, a digital or charge-coupled device (CCD) camera). *Id.* ¶ 28. The attachment 21 may also include an independent processor located on printed circuitboard (PCB) 25. *Id.* ¶ 33.

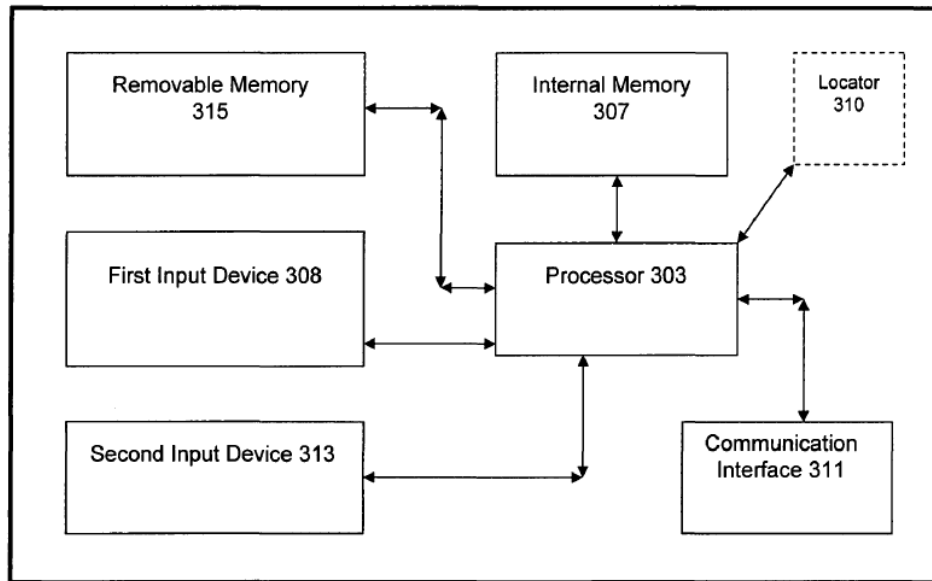
Vrotsos describes the function of processor 303 as follows:

The attachment 21 may also include a processor 303, a memory 307 and an input device 308. The processor may execute a software application (which may be stored in the attachment memory 307) allowing the processor to receive input information from the input device 308 and process the input information to generate data for transmission to a remote computer 101 via the antenna 5 of the wireless communication device 1. By executing the software application, the attachment may determine from which input device 308 it is receiving input information (if multiple input devices are provided), encrypt the input information, append additional information indicating the identity or location of the user (using locator 302, which may be a GPS position sensor and/or processor or a processor for measuring signal strength from multiple base stations of the communication network to determine the attachments location by triangulation), divide the input information into data packets

suitable for transmission over the communication network 102, etc.

Id. ¶ 75.

Figure 11 of Vrotsos is reproduced below.



Attachment 21

FIGURE 11

Vrotsos’s Figure 11, above, is a block diagram that “illustrates a second embodiment of an attachment according to an embodiment of the present invention.” *Id.* ¶ 24.

Vrotsos further describes the function of processor 303 in its second embodiment as follows:

Generally, the processor 303 is responsible for controlling the hardware components located within the attachment 21. The processor 303 may also include software or code that enables or executes encryption processing on any transaction data or identification data. In an embodiment of the invention, the encryption is performed before the data is transmitted to the communication interface 311. In an embodiment of the invention, encryption is performed before storage of any transaction, measurement, or identification data in the removable memory 315 or the internal memory 307. The internal memory

307 may be a volatile memory that is utilized by the processor 303 as workspace for its processing. The internal memory 307 may also have a non-volatile section. The non-volatile section of the internal memory may store the encryption key currently utilized by the attachment 21.

Id. ¶ 80.

Vrotsos further describes that “the attachment 21 may transmit a message to the GUI of the wireless electronic device 1 prompting a user of the device 1 to move a card past the reader in the attachment 21, e.g., to swipe the credit card or debit card through the reader.” *Id.* ¶ 52. Vrotsos discloses a reader assembly for reading information from a card or object, as illustrated in Figure 2(a) below. *Id.* ¶ 29.

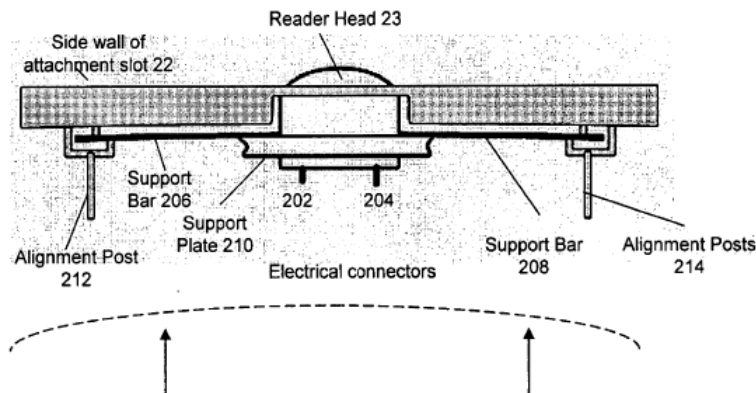


Fig. 2(a)

Vrotsos’s Figure 2(a), above, “illustrates a side cross-sectional view of a reader assembly including a reader head and a support structure.” *Id.* ¶ 29. “The user may move the card past the reader assembly and transaction data may be captured by the reader 23 in the attachment 21.” *Id.* ¶ 52. “The attachment 21 may encrypt the transaction data captured by the reader 23” and “wireless communications device 1 may receive the encrypted transaction data from the attachment 21.” *Id.*

iii. Bryant (Ex. 1010)

Bryant describes an “[a]n accessory device for a wireless telephone or handset” that “functions as either a shoulder rest or a stand” as illustrated in Figure 1 below. Ex. 1010, Abst.

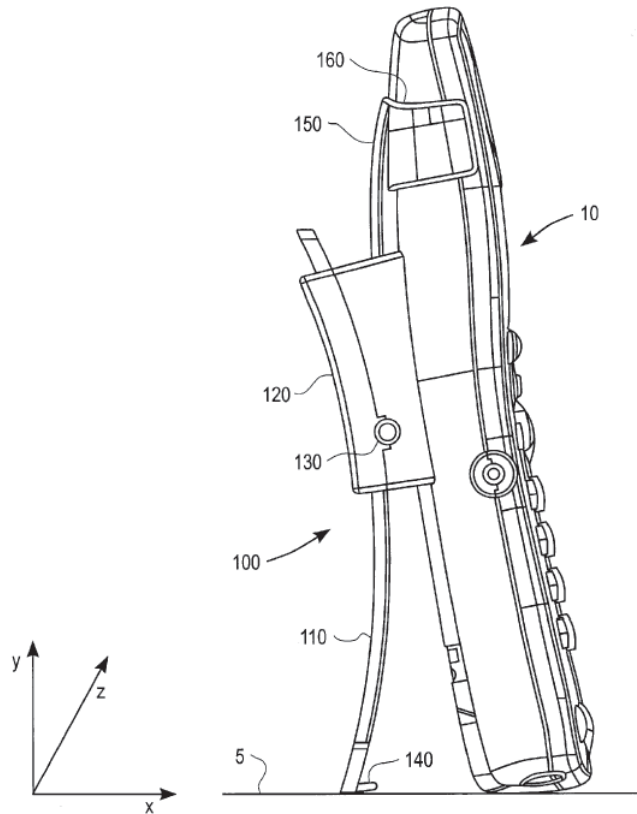


FIG. 1

Bryant’s Figure 1, above, shows “a telephone shoulder rest and stand 100 attached to a cordless telephone handset 10.” *Id.* at 2:66–67. In Figure 1, support 100 is configured to operate as a stand. *Id.* at 3:5–6. As shown in Figure 1, “support 100 comprises a sliding arm 110, a body 120, a locking pin 130, a foot 140, an attaching extension 150, a pair of attaching arms 160 and a shoulder rest surface 170.” *Id.* at 3:11–14.

Figure 4A of Bryant, reproduced below, depicts a front perspective view of telephone shoulder rest 100.

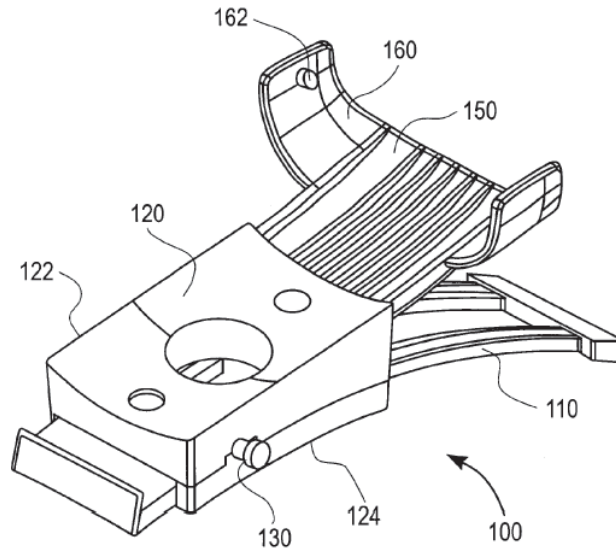


FIG. 4A

Bryant's Figure 4A, above, shows an attaching pin 162 on one of the attaching arms 160. *Id.* at 4:4–5. “There is an opposing attaching pin 162 (not shown) on the other attaching arm 160.” *Id.* at 4:5–6. Bryant describes how support 100 is attached to a telephone handset as follows:

The support 100 is attached to the handset 10 by inserting the attaching pins 162 into corresponding openings (not shown) on the sides of the handset 10, with the front surface of the base 122 touching the rear surface of the handset 10. The attaching arm 160 is flexible so that the attaching pins 162 can easily be inserted into and removed from the corresponding openings in the handset 10, so that the support 100 is easily removed from the handset 10.

Id. at 4:14–21.

b. Obviousness over Valliani and Vrotsos

Petitioner asserts claims 1–6 and 22–27 are unpatentable as obvious under 35 U.S.C. § 103 over the combination of Valliani and Vrotsos. Pet. 16–49.

i. *Independent Claim 1*

Preamble

Claim 1 recites the following preamble: “An apparatus for effecting commercial transactions between an input device and a remote transaction server using a communication device.”¹ Ex. 1001, 12:10–13. Petitioner provides an annotated version of Figure 1 of Valliani, reproduced below. Pet. 17.

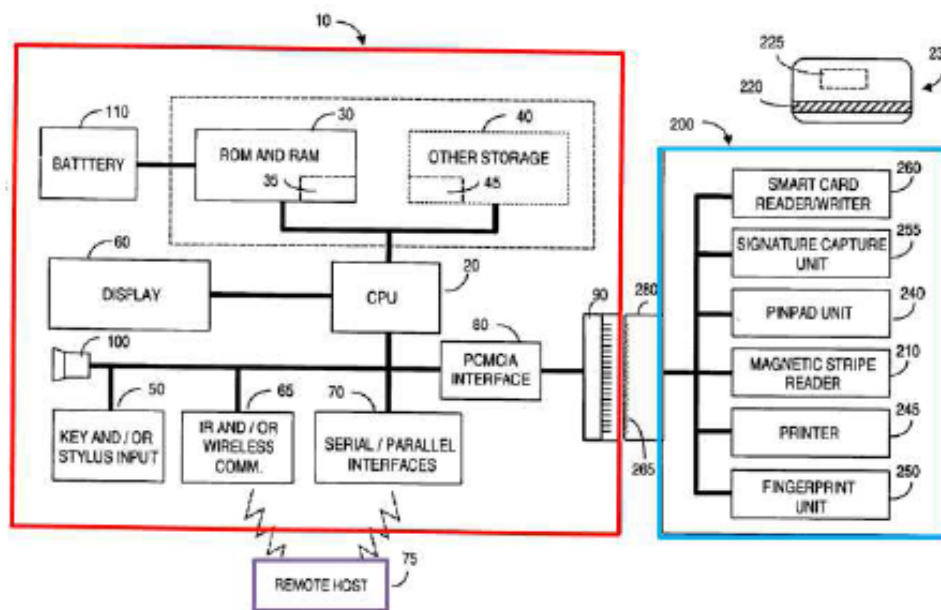


FIG. 1

Petitioner's annotated Figure 1, above, depicts a block diagram of a generic PCMCIA compliant device 10 (bordered in red), such as a laptop computer or personal digital assistant (PDA), combined with a module 200 (bordered in blue) including a magnetic stripe reader 210. Device 10 is in

¹ Petitioner does not take a position as to whether the preamble of claim 1 is limiting, but addresses the preamble of claim 1 only “[t]o the extent it is deemed limiting.” *See* Pet. 16.

communication with remote host 75 (bordered in purple). *See* Ex. 1005, 3:50–54, 4:38–40, Fig. 1.

Petitioner asserts that Valliani teaches the recited apparatus of the preamble because “Valliani discloses a module 200 (blue) as an *apparatus* that includes a magnetic stripe reader 210 (blue) and that plugs into a device 10 (red), which is a personal digital assistant (‘PDA’) corresponding to a *communication device*.” Pet. 16–17 (citing Ex. 1005, 3:51–54; Ex. 1003, ¶¶ C1, C7).²

Petitioner also asserts that Valliani’s magnetic stripe reader 210 includes a slot 290 and a read head, which together form an *input device*. Pet. 18 (citing Ex. 1005, 5:20–22; *see also* Ex. 1003 ¶ C9).

Petitioner also asserts that Valliani’s:
device 10 communicates with a “remote host system to further process a transaction for which the card is being used.” Ex. 1005, Abstract. Specifically, that remote host 75 (purple) is a remote transaction server that receives a known token PIN and compares that PIN to the fingerprint PIN to authenticate the true owner of the card. *Id.*, 7:13–25. A commercial transaction takes place between the input device and the remote transaction server when the PINs match. In other words, when the host authenticates the card owner’s identity, the transaction is allowed to proceed.
Pet. 18 (citing Ex. 1003 ¶¶ C5, C8, C10).

Petitioner asserts that “Valliani’s module 200 is an *apparatus for effecting commercial transactions between an input device and a remote transaction server using a communication device*.” Pet. 19 (citing Ex. 1003 ¶ C13).

² Although we were unable to find an explanation in the Petition, we assume, for example, the notation “Ex. 1003 ¶ C1” in the Petition refers to paragraph 1 of Appendix C of Exhibit 1003, the Declaration of Dr. Shamos.

Patent Owner asserts that Valliani does not disclose “effecting commercial transactions between an input device and a remote transaction server.” PO Resp. 10–11. Patent Owner argues that “[m]atching PINs or authenticating the card owner’s identity is not the same thing as effecting a commercial transaction. Ex. 2004 ¶ 24. A [person of ordinary skill in the art] would understand that a commercial transaction is any transaction that involves some form of payment, or money transfer, in exchange for goods and services.” PO Resp. 11. Patent Owner argues that “Valliani uses remote host 75 for retrieving and verifying PIN and signature data—not for processing a commercial transaction.” *Id.* at 12 (citing Ex. 2004 ¶ 26). Patent Owner argues, “Valliani provides no indication as to how the final commercial transaction would be conducted or would be provided.” PO Resp. 12.

We disagree with Patent Owner that Valliani does not disclose “effecting commercial transactions between an input device and a remote transaction server.” Patent Owner’s argument that authenticating a card owner’s identity is not the same thing as effecting a commercial transaction is unavailing, because authentication is a necessary and integral part of electronic commercial transactions. For example, if authentication were to fail (by determining that the user is not the card owner), an attempted commercial transaction would likely be rejected, and its purpose frustrated. *See, e.g.*, Ex. 1005, 6:39–46.

Patent Owner’s argument that Valliani does not specify how a commercial transaction would be conducted or provided is equally unavailing. *See* PO Resp. 12. To the extent Patent Owner contends that “effecting commercial transactions” requires more than what is taught in Valiani, Patent Owner does not cite to any intrinsic evidence to support its

attempt to incorporate additional requirements into the claim and, therefore, we decline to do so.

Valliani's invention is directed to "a portable point of sale transaction terminal." Ex. 1005, Abstr. Valliani's "device can communicate . . . with a remote host system to further process a transaction for which [a] card is being used." *Id.* In discussing the background of the invention, Valliani explains that "[s]uch systems are commonly used when a consumer (or user) pays for a purchase." Ex. 1005, 1:30–31. Valliani further explains, "there is a need for a method and mechanism by which generic computing/PDA devices can be made to perform point of sale transaction functions." *Id.* at 2:32–34. "The present invention," Valliani states, "provides such a method and system to implement point of sale transaction terminals." *Id.* at 2:38–39.

Valliani explains that its device is for credit card transactions, reads the information from the magnetic stripe (or a smart card), and communicates with a remote host system to process a transaction. *Id.* at 2:55–3:5. Valliani also discusses vendors who transact business "at a flea market or a garage sale" (*id.* at 2:25–28), and "a library . . . conducting a used book sale, and some patrons wish to purchase books with credit cards" (*id.* at 5:65–66). Indeed, Patent Owner's expert, Mr. Zatkovich, acknowledges that commercial transactions may occur at flea markets, garage sales, and yard sales. *See* Ex. 1019, 136:13–23. We credit Petitioner's expert, Dr. Shamos, who credibly testifies that a person of ordinary skill in the art "would have understood Valliani as *effecting a commercial transaction* between the module 200 and the remote host server 75 via the mobile device 10." Ex. 1017 ¶ 14.

We are persuaded by Petitioner's evidence and arguments that Valliani teaches an apparatus (module 200) for effecting commercial

transactions between an input device (magnetic stripe reader 210, slot 290 and a read head) and a remote transaction server (remote host 75) using a communication device (device 10). *See* Pet. 16–19 (citing Ex. 1003 ¶¶ C1, C5, C7–C12; Ex. 1005, 3:23–25, 3:51–54, 4:50–54, 5:15–22, 7:13–25).

Based on the complete record and for the reasons discussed herein, we are persuaded that Petitioner has demonstrated that Valliani teaches “[a]n apparatus for effecting commercial transactions between an input device and a remote transaction server using a communication device” as recited in the preamble of claim 1.^{3,4}

[1.A] “an input device for capturing recorded information from a transaction card”

Petitioner asserts that Valliani teaches this limitation because “Valliani’s module 200 includes a magnetic stripe reader 210, which includes a slot 290 and a read head, which together form the *input device*.” Pet. 20 (citing Ex. 1005, 5:15–17, 5:19–21, 5:27–29, 7:13–14, Figure 2; Ex. 1003 ¶¶ C25–28). Petitioner argues that “Valliani’s magnetic stripe 220 contains *recorded information* embedded in the stripe including ‘at least the card owner’s credit account company and account number and owner identification’ (Ex. 1005, 5:27–29) and a ‘token PIN... stored in card 230 (magnetically in stripe 220).’” Pet. 20 (citing Ex. 1005, 7:13–14). Petitioner

³ We do not reach the issue of whether the preamble is limiting. Regardless of whether the preamble is limiting, we are persuaded that Petitioner demonstrates that the recitation of the preamble is met by Valliani.

⁴ Petitioner asserts that “Vrotsos also discloses the preamble.” Pet. 19 (citing Ex. 1003 ¶¶ C14–23). Because we find that Petitioner has demonstrated Valliani satisfies the preamble, we do not reach Petitioner’s alternative assertions regarding Vrotsos.

argues that “[b]ecause the slot 290 aligns the card with the read head and the read head senses the magnetic charge of the stripe, the slot and read head together form *an input device for capturing recorded information from a transaction card.*” Pet. 20 (citing Ex. 1003 ¶¶ C25–28).

Patent Owner does not respond substantively to Petitioner’s arguments or evidence with respect to this limitation of claim 1. *See* PO Resp. 10–29.

We are persuaded by Petitioner’s evidence and arguments that Valliani teaches an input device (module 200 includes a magnetic stripe reader 210, which includes a slot 290 and a read head) for capturing recorded information (magnetic stripe 220 contains recorded information embedded in the stripe including at least the card owner’s credit account company and account number and owner identification) from a transaction card (card 230). *See* Pet. 20 (citing Ex. 1003 ¶¶ C25–28; Ex. 1005, 5:15–21, 5:27–29, 7:13–14, Fig. 2).

Based on the complete record and for the reasons discussed herein, we are persuaded that Petitioner has demonstrated that Valliani teaches “an input device for capturing recorded information from a transaction card” as recited in claim 1.

[1.B.1]: “a sensor incorporated into said input device for reading said recorded information stored on said transaction card”

Petitioner asserts that Valliani teaches this limitation, arguing:

Valliani discloses the slot and read head together as the input device. That input device includes the “read head . . . [that] senses magnetic charge embedded in stripe(s) 220” of the credit card 230, when the “magnetic stripe 220 moves through slot 290.” Ex. 1005, 5:19–24. That read head is a sensor incorporated

into said input device and is for reading said recorded information stored on the credit card 230, corresponding to the transaction card.

Pet. 21 (citing Ex. 1003 ¶¶ C29–31).

Petitioner also argues, “[a]lternatively, Vrotsos . . . discloses this element.” Pet. 21 (citing Ex. 1003 ¶¶ C32–C33).⁵

Patent Owner does not respond substantively to Petitioner’s arguments or evidence with respect to this limitation. *See* PO Resp. 10–29.

We are persuaded by Petitioner’s evidence and arguments that Valliani teaches a sensor (read head in unit 210), incorporated into said input device (magnetic stripe reader 210, slot 290, read head) for reading said recorded information (magnetic stripe 220 contains recorded information embedded in the stripe) stored on said transaction card (card 230). *See* Pet. 20 (citing Ex. 1003 ¶¶ C25–28; Ex. 1005, 5:15–21, 5:27–29, 7:13–14, Fig. 2).

Based on the complete record and for the reasons discussed herein, we are persuaded that Petitioner has demonstrated that Valliani teaches “a sensor incorporated into said input device for reading said recorded information stored on said transaction card” as recited in claim 1.

[1.B.2]: “said sensor including circuitry for reading an analog signal”

Petitioner asserts that Valliani teaches this limitation. Pet. 21–23. Petitioner argues, “Valliani’s slot and read head, which together form the

⁵ Because we find that Petitioner has demonstrated Valliani satisfies the recited limitation, we do not reach Petitioner’s alternative assertion regarding Vrotsos for this limitation.

sensor [], includes *circuitry for reading an analog signal*.” *Id.* at 21 (citing Ex. 1003 ¶¶ C29–31. Petitioner also argues:

[w]hile Valliani does not expressly recite the internal circuitry of the ubiquitous read head, it describes in detail the function of it. Similarly, the '107 patent does not expressly disclose any circuitry for its sensor and is less specific than what is described in Valliani. The read head includes circuitry for reading an analog signal because such circuitry is inherently in the read head. In fact, Valliani expressly states that components of magnetic stripe reader 210 include “[e]lectrical and mechanical components . . . [that] are known and need not be described in detail” and further states that “unit 210 is understood to include hardware and software necessary to implement the magnetic stripe reader unit.” . . . “Magnetic read heads have been known for at least five decades” and “[s]uch red heads necessarily include a coil that generates an analog signal in response to changes in magnetic flux.”

Pet. 21–22 (citing Ex. 1003 ¶¶ C34–C42; Ex. 1005, 5:2–4, 5:17–26; Ex. 1009 ¶¶ 29–31, 33) (internal citation omitted).

Petitioner argues that “[r]eading information from a magnetic stripe corresponds to *reading an analog signal*.” Petitioner explains that:

“as magnetic stripe 220 moves through slot 290, a read head . . . senses magnetic charge embedded in stripe(s).” Ex. 1005, 5:19–22. In other words, the magnetic stripe card has a magnetic stripe, within which magnetic charge is embedded and this magnetic charge (or domain) represents the data on the card. Ex. 1003 ¶ C46. Reading a “magnetic charge embedded in stripe(s)” necessarily corresponds to reading an *analog signal*. Ex. 1003 ¶¶ C46–47. As a coil of the read head passes over the magnetic stripe (*i.e.*, as the credit card is swiped through the slot), the coil senses the variation of the magnetic charge embedded within the magnetic stripe, causing the read head to magnetically sense the information, corresponding to *reading an analog signal*. Ex. 1003 ¶ C46. *See* Ex. 1003 ¶¶ C43–48.

Pet. 23.

Petitioner also asserts that Vrotsos discloses this limitation. Pet. 23 (citing Ex. 1003 ¶¶ C32–33, C49).⁶

Patent Owner does not respond substantively to Petitioner’s arguments or evidence with respect to this limitation of claim 1. See PO Resp. 10–29.

We are persuaded by Petitioner’s evidence and arguments that Valliani teaches a sensor (read head in unit 210) including circuitry (“[e]lectrical and mechanical components . . . [that] are known and need not be described in detail,” including “hardware and software necessary to implement the magnetic stripe reader unit”) for reading an analog signal (“as magnetic stripe 220 moves through slot 290, a read head . . . senses magnetic charge embedded in stripe(s)”). See Pet. 21–23 (citing Ex. 1003 ¶¶ C34–C42, C43–C48; Ex. 1005, 5:2–4, 5:14–29).

Based on the complete record and for the reasons discussed herein, we are persuaded that Petitioner has demonstrated that Valliani teaches a “sensor including circuitry for reading an analog signal,” as recited in claim 1.

[1.C]: “a controller coupled to said sensor for converting the recorded information stored on said transaction card into a format suitable for transmission to a communication device”

Petitioner asserts that Valliani, or alternatively Vrotsos, teaches this limitation. Pet. 24–31.

⁶ Because we find that Petitioner has demonstrated Valliani satisfies the recited limitation, we do not reach Petitioner’s alternative assertion regarding Vrotsos for this limitation.

Petitioner first argues:

Valliani's magnetic stripe reader 210 includes a controller coupled to the read head, which is the sensor. As shown in Figure 2 (reproduced and annotated below) Valliani's magnetic stripe reader 210 (blue) sits on or within the module 200, adjacent the device 10. The magnetic stripe reader 210 incorporates "electrical and mechanical components," including a controller that reads and processes recorded information from the magnetic stripe 220 (purple) of the credit card 230 (green), which is the transaction card. Ex. 1005, 5:17–19. For example, the "[a]ssociated read head electronics in unit 210 can process the magnetically sensed information to learn what was embedded in stripe 220." *Id.*, 5:24–26. See Ex. 1003 ¶¶ C51–52.

Pet. 24.

Valliani's Figure 2, annotated by Petitioner, is shown below.

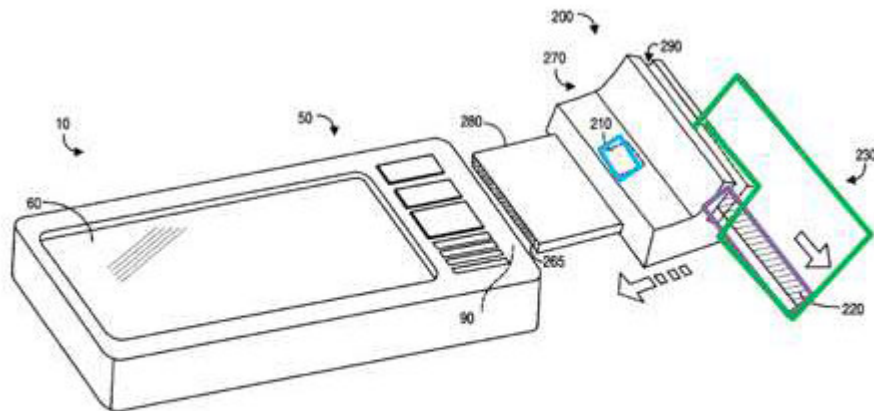


FIG. 2

Valliani's annotated Figure 2, above, shows module 200 adjacent to device 10. Module 200 has magnetic stripe reader 210 (blue). Card 230 (green) with magnetic stripe 220 (purple) fits into card reader slot 290.

Petitioner argues:

Valliani expressly states that those "[e]lectrical and mechanical components . . . are known and need not be described in detail" (Ex. 1005, 5:17–19) and further states that "unit 210 is

understood to include hardware and software necessary to implement the magnetic stripe reader unit.” *Id.*, 5:2–4. A [person of ordinary skill in the art] would have appreciated that those associated read head electronics in unit 210 correspond to the *controller* to process the magnetically sensed information. *See* Ex. 1003 ¶ C54. Accordingly, the *controller* is *coupled* to the read head so as to receive and process the analog signal read by the read head. *See* Ex. 1003 ¶¶ C52–54.

Pet. 25.

Petitioner also argues:

The *controller* within the magnetic stripe reader 210 would *convert[] the recorded information* from the card 230’s magnetic stripe into a *format suitable for transmission* to the device 10, which is the *communication device*. Ex. 1003 ¶ C58. [T]he *recorded information* “embedded in stripe 220 will include at least the card owner’s credit account company and account number and owner identification” (*id.*, 5:24–29) as well as the token PIN (*id.*, 7:13–14). The electronics in unit 210 (or other electronics within the module 200) provide that *recorded information* to the device 10. Ex. 1003 ¶ C57. This would have enabled the device 10 to transmit that *recorded information* to the remote host 75 for validation of the transaction. *Id.* In order to validate the transaction, the remote host 75 would need to receive *recorded information*, such as the credit account company, account number, owner identification information, and/or token PIN. *Id.* Accordingly, the *recorded information* is transmitted to the device 10. *See* Ex. 1003 ¶¶ C52, C55–58.

Pet. 25–26.

Petitioner further argues:

The only interface between the module 200 and the device 10 in Valliani is a PCMCIA interface. Ex. 1005, Abstract (stating the module 200 slides into a PCMCIA slot of device “to make mechanical and electrical connections”). In order for the module 200 to transmit the *recorded information* to the device 10, the electronics within the module 200 *convert[] the recorded information into a format suitable for transmission*, such as the PCMCIA interface format. Communication between module 200

and device 10 takes place using some communication protocol. Ex. 1003 ¶¶ C58–59. To transmit the data, the data must be formatted according to the protocol that is being employed. Ex. 1003 ¶ C58. Thus, the “process[ing of] the magnetically sensed information” performed by the associated read head electronics in unit 210 ([Ex. 1005] 5:24–26) would have included *converting* of that *recorded information* into the PCMCIA interface format, for transmission to the device 10. (Ex. 1003 ¶¶ C52, C62). See Ex. 1003 ¶¶ 56, C60–62.

Pet. 26–27.

Petitioner next argues that “[t]o the extent Valliani does not disclose this feature, a [person of ordinary skill in the art] would have found it obvious to consider other prior art, such as Vrotsos.” *Id.* at 27.

Vrotsos’ Figure 10, annotated by Petitioner, is shown below.

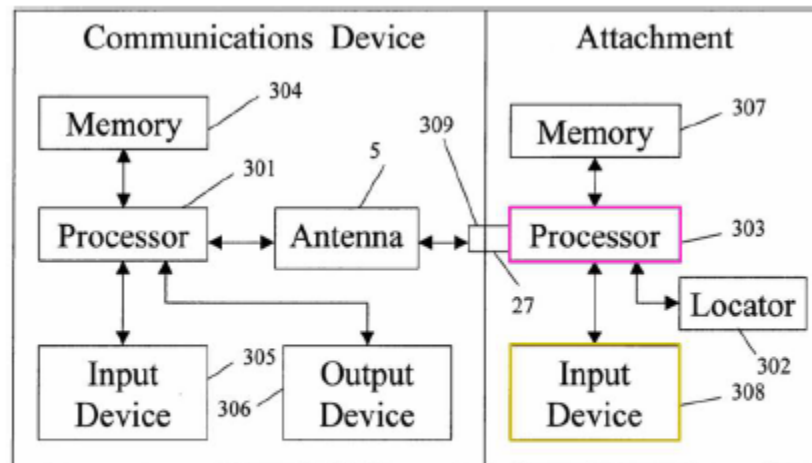


FIGURE
10

Vrotsos’ annotated Figure 10, above, is a block diagram showing a Communications Device connected to an Attachment. The Attachment includes Locator 302, Processor 303 (pink), Memory 307, and Input Device 308 (gold). According to Petitioner, “processor 303 (pink), corresponding to the [claimed] *controller*, is coupled to the input device 308 (gold), which includes the reader head 23, i.e., the [claimed] *sensor*.” Pet. 27.

Petitioner argues, “Vrotsos describes the processor 303 as *converting* magnetic stripe information *into a format suitable for transmission* to the cellular telephone in at least two ways.” *Id.* at 29 (citing Ex. 1003 ¶ C71).

First, Vrotsos discloses formatting the input information in accordance with the interface between the attachment 21 and the communications device (*see* [Ex. 1006] ¶ 43). Any data transmitted by the attachment 21 to the phone would need to be in a *format suitable for transmission* so that the phone could receive and interpret that data. Ex. 1003 ¶ C71. Vrotsos discloses an RS-232 interface between the attachment and the phone (Ex. 1006 ¶¶ 35, 43) and “other types of serial or parallel interface connectors may be used” ([Ex. 1006] ¶ 43) such as a PCMCIA interface. Ex. 1003 ¶ C76 (“The PCMCIA interface was a well known, even ubiquitous, parallel interface at the time of the purported invention.”). Accordingly, before the attachment can transmit any data to the phone, the attachment would need to convert that data into a *format suitable for transmission* to the phone. Ex. 1003 ¶¶ C71, C74–77.

Second, Vrotsos discloses the attachment’s processor 303 as “divid[ing] the input information into data packets suitable for transmission over the communication network 102.” [Ex. 1006] ¶ 75, *see also id.*, ¶ 94. Packetizing the card data is *converting into a format suitable for transmission* because forming data packets prepares the data for the phone to transmit the data over the cellular network.

Pet. 30 (citing Ex. 1003 ¶¶ C71–73).

Patent Owner argues that:

The ’107 patent claims require that the controller control the flow of operations from the transaction apparatus and transmit it to the wireless communication device. Ex. 2004 ¶ 32. This includes receiving information from the sensor that reads information from the transaction card. *Id.* The controller then needs to interpret and process that information as digital payment information, then convert that to a format suitable for transmission to the mobile communication device. *Id.* The controller also provides for any encryption. Ex. 1001, 9:10–14.

PO Resp. 14.

Patent Owner also argues that a person of ordinary skill in the art: would understand that the controller would have to receive and validate that information from the transaction card before passing on the information to a communication device. Ex. 2004 ¶ 33. For example, the data fields that would need validation include the Primary account number format (which is different for different card types), a check digit to identify data transmission errors, as well as a valid country code and service code.

PO Resp. 14–15. Patent Owner argues that “the controller would require a microprocessor, microcontroller, or a controller with similar processing power.” *Id.* at 15.

Patent Owner argues that Valliani “does not disclose such a controller, or even really discuss control of the operations for the device.” *Id.* at 15. Patent Owner argues “Valliani specifically asserts its connected device 10 as the device to perform processing on behalf of the module 200, which does not have the same processing capability as Valliani envisioned for device 10.” *Id.* at 15–16 (citing Ex. 1005, 6:4–16, claims 1, 12; Ex. 2004 ¶¶ 35–36). “Claims 1 and 22 of the ’107 patent,” Patent Owner argues, “require that the claimed controller is coupled to the sensor.” PO Resp. 16. In Valliani, Patent Owner argues, “the only device that might contain the functionality of the sensor claimed in the ’107 patent is located in the mobile device 10, not in the reader module 200 where it could be coupled to the sensor.” *Id.* (citing Ex. 2004 ¶¶ 37–38).

We disagree with Patent Owner and find that Valliani teaches a “controller” as recited in claim 1 of the ’107 patent. According to Patent Owner, the recited “controller would require a microprocessor, microcontroller, or a controller with similar processing power.” *Id.* at 15. The ’107 patent, however, acknowledges that at the time of the claimed

invention it was already known in the art that point of sale (POS) devices, may “include a processor as well as an input device to receive and process information from a transaction card” and that “[t]he processor of the POS device receives the information from the transaction card and sends it to a remote computer via a communication network” using a “wireless communication device.” Ex. 1001, 1:45–58. Indeed, Patent Owner’s expert, Mr. Zatkovich, acknowledged that prior art POS devices would include a processor for verifying credit card data. *See* Ex. 1018, 19:11–20:25. Thus, a person of ordinary skill in the art at the time of the claimed invention would have known that prior art processors for card readers, such as the one described by Valliani, had electronics capable of converting card information into formats suitable for transmission to mobile devices. *See* Ex. 1017 ¶¶ 4–7; Ex. 1001, 6:36–40; Ex. 1019, 71:20–72:5.

Valliani describes just such a generic prior art point of sale device for converting data obtained from a transaction card to a format transmissible over a PCMCIA interface. *See* Ex. 1005, 3:51–4:3, 4:50–67; *see also* Ex. 1003 ¶¶ C27–37. Valliani’s card reader 210 incorporates “electrical and mechanical components,” capable of “process[ng] the magnetically sensed information [from a transaction card] to learn what was embedded in stripe 220.” Ex. 1005, 5:17–19, 24–26. *See also* Ex. 1003 ¶¶ C51–52. Valliani’s electronics 210 then converts the credit card data to a PCMCIA format and transmits it. Ex. 1003 ¶¶ C56–59.

Valliani expressly states that its “[e]lectrical and mechanical components . . . are known and need not be described in detail” (Ex. 1005, 5:17–19) and further states that “unit 210 is understood to include hardware and software necessary to implement the magnetic stripe reader unit.” *Id.*, 5:2–4. Petitioner’s expert, Dr. Shamos, testifies, and we agree, a person of

ordinary skill in the art “would have appreciated that those associated read head electronics in unit 210 correspond to the [recited] controller to process the magnetically sensed information for transmission to the mobile device.” Ex. 1003 ¶ C54.

Patent Owner’s attempts to incorporate additional limitations for the “controller” from the specification into claim 1 are also unavailing. For example, Patent Owner argues that the recited “controller” must be able to “control the flow of operations from the transaction apparatus and transmit it to the wireless communication device,” “interpret and process that information as digital payment information,” “validate that information from the transaction card before passing on the information to a communication device,” and “provide[] for any encryption.” See PO Resp. 14. For support, Patent Owner points to a single description from the ’107 specification indicating that controller 52 “provides operation flow” and “provides the encryption.” See *id.*; see also Ex. 2004 ¶¶ 32–33 (both citing Ex. 1001, 9:10–14).

However, we must be careful not to read a particular embodiment appearing in the written description into the claim if the claim language is broader than the embodiment, as is the case here. *In re Van Geuns*, 988 F.2d 1181, 1184 (Fed. Cir. 1993). “Though understanding the claim language may be aided by the explanations contained in the written description, it is important not to import into a claim limitations that are not a part of the claim.” *SuperGuide Corp. v. DirecTV Enters., Inc.*, 358 F.3d 870, 875 (Fed. Cir. 2004). Thus, it would be improper for us to import from the description of this particular embodiment the additional limitations argued by Patent Owner for the recited “controller” of claim 1.

With respect to Petitioner’s alternative assertion that Vrotsos teaches the recited controller (*see* Pet. 27–31), Patent Owner does not respond to Petitioner’s evidence and argument on this issue. *See* PO Resp. 10–23, Pet. Reply 6, 9 n.4.

With respect to Vrotsos, we agree with Petitioner that Vrotsos alternatively teaches a controller (processor 303) coupled to an input device 308, which includes a sensor (read head 23) for converting the recorded information stored on transaction card 51 into a format suitable for transmission to communications device 1, such as when processor 303 divides the input information into data packets suitable for transmission over communication network 102. *See* Pet. 27–31 (citing Ex. 1003 ¶¶ C67–77).

Petitioner also argues that “[t]o the extent Valliani does not provide a specific configuration of the module 200 that performs [the recited] *converting for transmission*, a [person of ordinary skill in the art] would have been motivated to look to Vrotsos to provide further detail of how to *convert said recorded information into a format suitable for transmission*.” Pet. 31. “Specifically,” Petitioner argues, a person of ordinary skill in the art “would have found it obvious to implement the *controller* of Valliani’s electronics 210 to include the functionality of Vrotsos’s processor 303 to *convert[] the recorded information into a format suitable for transmission to the device 10*.” *Id.* (citing Ex. 1003 ¶¶ C67, C77). We consider Petitioner’s arguments and evidence concerning the reasons to combine Valliani and Vrotsos in this manner in Section II.C.2.b.ii, *infra*.

Based on the complete record and for the reasons discussed herein, we are persuaded that Petitioner has demonstrated that Valliani, or alternatively, Vrotsos, teaches a “a controller coupled to said sensor for converting the

recorded information stored on said transaction card into a format suitable for transmission to a communication device” as recited in claim 1.

[1.D]: “a communication link for coupling said controller to a communication device for the transmission of said recorded information therebetween”

Petitioner asserts that Valliani teaches this limitation because, in Valliani:

the PCMCIA interface is a communication link for coupling said controller to the device 10, which is a communication device. Specifically, the module 200 has a projecting snout-like member 280 that plugs into socket 90 (“mounted in a so-called PCMCIA-slot in the housing of unit 10”) in the device 10 to effectuate transmission there between.

Pet. 33 (citing Ex. 1005, 4:22–27; *see also id.*, 4:50–54; Ex. 1003 ¶¶ C83–84). Petitioner argues that “[a]ny data transmission from the controller to the device (and vice versa) occurs over that PCMCIA interface.” Pet. 33–34 (citing Ex. 1003 ¶ C86). “Accordingly,” Petitioner argues, “that PCMCIA interface is *for the transmission of said recorded information therebetween.*” Pet. 34. Dr. Shamos provides credible testimonial evidence supporting Petitioner’s argument. *See* Ex. 1003 ¶¶ C80–86.

Petitioner argues that Vrotsos also teaches this limitation because “Vrotsos also expressly shows in Fig. 7 a communication link between attachment 21 and the wireless communication device 1.” *Id.* at 34 (citing Ex. 1003 ¶ C87).⁷

⁷ Because we find that Petitioner has demonstrated Valliani satisfies the recited limitation, we do not reach Petitioner’s alternative assertion regarding Vrotsos for this limitation.

Patent Owner does not respond substantively to Petitioner's arguments or evidence with respect to this limitation of claim 1. *See* PO Resp. 10–29.

Based on the complete record and for the reasons discussed herein, we are persuaded that Petitioner has demonstrated that Valliani teaches a communication link (PCMCIA interface) for coupling a controller (associated electronics 210) to a communication device (10) for the transmission of recorded information as recited in claim 1.

[1.E.1]: “wherein the said sensor reads the recorded information stored on said transaction card”

Petitioner asserts that Valliani teaches this limitation because “Valliani’s read head is *a sensor for reading said recorded information stored on said transaction card.*” Pet. 34.

As Valliani explains, “magnetic stripe 220 moves through slot 290, a read head associated with unit 210 senses magnetic charge embedded in stripe(s) 220. . . . Associated read head electronics in unit 210 can process the magnetically sensed information to learn what was embedded in stripe 220.” Ex. 1005, 5:19–26; *see also* Pet. 21, 34. According to Petitioner, the read head is a sensor incorporated into an input device for reading recorded information stored on credit card 230, which corresponds to a transaction card. Pet. 21. Dr. Shamos provides credible testimony supporting Petitioner’s arguments. *See* Ex. 1003 ¶¶ C29–31, 89.

Petitioner also argues that Vrotsos discloses a *sensor for reading said recorded information*. *Id.* (citing Ex. 1003 ¶¶ 89–90).⁸

Patent Owner does not respond substantively to Petitioner’s arguments or evidence with respect to this limitation of claim 1. *See* PO Resp. 10–29.

Based on the complete record and for the reasons discussed herein, we are persuaded that Petitioner has demonstrated that Valliani teaches a sensor (read head in unit 210) that reads recorded information (magnetic stripe 220 contains recorded information embedded in the stripe) stored on a transaction card (card 230) as recited in claim 1.

[1.E.2]: “said controller converts said recorded information read by said sensor into a format suitable for transmission to said communication device”

Petitioner argues that Valliani discloses a controller (associated electronics 210) for converting recorded information stored on a transaction card (card 230) into a format suitable for transmission to a communication device (device 10). *See* Pet. 34–35; *see also id.* 24–27. Petitioner also argues Valliani’s read head (mag stripe reader 210, slot 290) reads the recorded information (mag stripe 220 contains recorded information) stored on the transaction card (card 230). *Id.* Petitioner argues the controller (associated electronics 210) converts the recorded information read by the sensor (read head in unit 210) into a format suitable for transmission to the communication device (device 10). *Id.* Dr. Shamos provides credible

⁸ Because we find that Petitioner has demonstrated Valliani satisfies the recited limitation, we do not reach Petitioner’s alternative assertion regarding Vrotsos for this limitation.

testimonial evidence supporting Petitioner's arguments. *See* Ex. 1003 ¶¶ C51–62, 91–92.

Petitioner also argues that Vrotsos discloses this limitation when the controller performs its given function. Pet. 35 (citing Ex. 1003 ¶¶ C91–92).⁹

Patent Owner does not respond substantively to Petitioner's arguments or evidence with respect to this limitation of claim 1. *See* PO Resp. 10–29.

Based on the complete record and for the reasons discussed herein, we are persuaded that Petitioner has demonstrated that Valliani teaches a controller (associated electronics 210) that converts recorded information (mag stripe 220 contains recorded information) read by a sensor (read head in unit 210) into a format suitable for transmission to a communication device (device 10) as recited in claim 1.

[1.E.3]: “[said controller] transmits said recorded information via the communication link to said communication device”

Petitioner argues Valliani discloses a PCMCIA connection corresponding to the recited communication link. Pet. 35. Petitioner also argues that the electronics in magnetic stripe reader 210 (the controller) transmits the recorded information via the PCMCIA interface to device 10. *Id.*, *see also id.* at 32–34. Dr. Shamos provides credible testimonial evidence supporting Petitioner's argument. *See* Ex. 1003 ¶¶ C93.

⁹ Because we find that Petitioner has demonstrated Valliani satisfies the recited limitation, we do not reach Petitioner's alternative assertion regarding Vrotsos for this limitation.

Petitioner also argues, to the extent that Valliani does not disclose the *controller* transmitting the *recorded information* over the PCMCIA interface, a person of ordinary skill in the art, “would have looked to other art, such as Vrotsos for this implementation.” Pet. 35–36 (citing Ex. 1003 ¶¶ 93–97). Petitioner argues, “applying the functionality of Vrotsos’s processor 303 to Valliani’s electronics would have enabled the electronics in the magnetic stripe reader 210 to *transmit said recorded information via the PCMCIA interface, corresponding to the communication link, to said communication device.*” Pet. 36. We consider Petitioner’s arguments and evidence concerning the reasons to combine Valliani and Vrotsos in this manner in Section II.C.2.b.ii, *infra*.

Patent Owner does not respond substantively to Petitioner’s arguments or evidence with respect to this limitation of claim 1. *See* PO Resp. 10–29.

Based on the complete record and for the reasons discussed herein, we are persuaded that Petitioner has demonstrated that Valliani teaches a controller (associated electronics 210) that transmits recorded information (mag stripe 22 contains recorded information) via a communication link (PCMCIA interface) to a communication device (device 10) as recited in claim 1.¹⁰

¹⁰ Because we find that Petitioner has demonstrated Valliani satisfies the recited limitation, we do not reach Petitioner’s alternative assertion that Vrotsos also teaches this limitation.

[1.E.4]: “*said communication device transmits said recorded information to a remote transaction server for processing a commercial transaction*”

Petitioner asserts that Valliani teaches this limitation. Pet. 36–38.

Petitioner argues:

Valliani’s device 10 is a *communication device* that receives card data from module 200. *See* Ex. 1005, 5:32–35. The device 10 also transmits information to a host system 75, which then validates that information. The host system 75 is a *remote transaction server for processing a commercial transaction*. Specifically, the device 10 “communicate[s] with host 75” to send magnetic stripe data including the account number and additionally the known token PIN (the account number and/or the known token PIN corresponding to *the recorded information* []) to host system 75. Ex. 1005, 7:13–17. The account number is sent to the host system 75 to facilitate the commercial transaction and apply the credit card charge to the correct account.

Pet. 36–37 (citing Ex. 1003 ¶ C103; *see also* ¶¶ C98–102).

Petitioner also argues:

For enhanced security, a transaction-generated fingerprint token PIN (generated from scanning the card owner’s fingerprint at module 200) is also sent to the host system 75 via device 10. Ex. 1003 ¶¶ C102–103. The host system 75 determines whether the “transaction-generated fingerprint token PIN value agrees with the known token PIN value” ([Ex. 1005] 7:18–19) to allow the transaction to proceed. In order for the host system 75 to compare the transaction-generated fingerprint token PIN with the known token PIN value, the host system 75 must receive the known token PIN value from the card 230. Ex. [1003] ¶ C103. Valliani discloses that the known token PIN value may be recorded on the magnetic stripe 220 of card 230. [Ex. 1005] 7:13–15. In that instance, the known token PIN value is transmitted to the remote system 75 via the device 10 to compare the transaction-generated fingerprint token PIN and the known token PIN value. Ex. 1003 ¶¶ C100, C103. Host system 75,

therefore, receives recorded information (e.g., card data and token PIN data) from device 10. *Id.* ¶ C103; *see also* ¶¶ C98–103.

Pet. 37.

Petitioner also asserts that “[t]o the extent Valliani does not disclose this limitation, Vrotsos discloses a communication device transmits said recorded information to a remote transaction server for processing a commercial transaction.” *Id.* at 38. Petitioner points to Vrotsos’ Figure 7 and Paragraph 53, arguing:

the wireless communication device 1 [] sends a transaction transmission to a server 101 [] over a wireless communications network 550, using a wireless communications protocol such as “CDMA, PCS, GSM, 802.11, or any wireless protocol utilized by any wireless device.” The transaction transmission includes “the encrypted transaction data,” from the card.

Pet. 38–39 (citing Ex. 1006 ¶¶ 52, 53, 59; *see also* Ex. 1003 ¶¶ 104–109).

Petitioner also argues that Vrotsos’ remote transaction server performs processing of a commercial transaction because:

Vrotsos discloses the server 101 “analyze[s] the transaction transmission . . . to verify authenticity of the user and other server 101 requirements.” Ex. 1006 ¶ 54. The server 101 also “send[s] a transaction response to the wireless communications device 1.” *Id.* That response “may be a confirmation number or approval number, a transaction denied request, or a request asking a user or the wireless communication device 1 for additional information.” *Id.* Accordingly, the server 101 *process[es] a commercial transaction*. *See* Ex. 1003 ¶¶ C110, C112.

Pet. 39.

Petitioner also argues that a person of ordinary skill in the art “would have been motivated to incorporate Vrotsos’s teachings of the *communication device transmits said recorded information to a remote transaction server to Valliani’s device 10, in order to enable the host system*

75 to process the commercial transaction.” Pet. 39–40. We consider Petitioner’s arguments and evidence concerning the reasons to combine Valliani and Vrotsos in this manner in Section II.C.2.b.ii, *infra*.

Patent Owner argues that a person of ordinary skill in the art “would understand that a commercial transaction is any transaction that involves some form of payment, or money transfer, in exchange for goods and services.” PO Resp. 17 (citing Ex. 2004 ¶ 43; Ex. 2001). Patent Owner also argues that “Valliani’s remote host 75 is only used for retrieving and verifying PIN and signature data, not for processing of the commercial transaction.” PO Resp. 17 (citing Ex. 2004 ¶ 44). Patent Owner further argues that “there is no disclosure in Valliani stating that the account number or any other common transaction information is ever sent to the host system 75.” PO Resp. 17 (citing Ex. 2004 ¶ 41).

Patent Owner argues:

[o]nly once this authentication function is performed does Valliani refers to a future step, which would be allowed or disallowed depending on the result of the authentication. Ex. 2004 ¶ 44. Beyond that, Valliani provides no indication that it processes any commercial transaction. *Id.* There is no indication as to how the final commercial transaction would be conducted. *Id.* Even where Valliani discusses the possibility of updating the stored balance on a transaction card (Ex. 1005, 8:2–6), it never discloses what information that must be passed, nor in what format, to determine the nature of the update to be made to the card. Ex. 2004 ¶ 46.

PO Resp. 18.

Patent Owner does not respond to Petitioner’s evidence and argument that Vrotsos separately teaches a remote transaction server for processing a commercial transaction. *See* PO Resp. 10–29.

We disagree with Patent Owner that Valliani does not teach transmitting recorded information to a remote transaction server for processing a commercial transaction. Contrary to Patent Owner's arguments, Valliani's invention is directed to performing commercial transactions. Valliani expressly states that "[t]he invention relates generally to data-capture systems *used to transact business*, and more particularly to enabling PCMCIA-equipped generic portable computer systems including personal digital assistants ("PDA") to *perform such point of sale transactions*." Ex. 1005, 1:16–20 (emphasis added). Valliani further explains that "such systems are designed and intended to be used [] as point of sale transaction terminals, *to be used to facilitate transactions*. Such systems are commonly used *when a consumer (or user) pays for a purchase*, or is to receive a credit-back, typically in conjunction with the consumer's credit card or debit card." *Id.* at 1:26–33 (emphasis added).

Patent Owner narrowly focuses on one aspect of processing a commercial transaction, the payment or transfer of money, to the exclusion of other essential aspects of a commercial transaction, such as the validity of the transaction card, verification of the card holder's identity, the identification of the financial institution, the account number, and the availability of adequate funds for the transaction. Indeed, Valliani explains that "[typical] information embedded in stripe 220 will include *at least* the card owner's credit account company and account number and owner identification." Ex. 1005, 5:26–29 (emphasis added). Valliani also explains that PIN information may be transferred from transaction card 230 to remote host system 75 to facilitate secure transactions. *See* Ex. 1005, 5:32–35, 7:13–25; Ex. 1003 ¶¶ 100–103.

The claim limitation at issue reads in relevant part “transmit[ting] said recorded information to a remote transaction server for processing a commercial transaction.” The limitation does not specify what particular recorded information is transferred to a remote transaction server to process a commercial transaction. Information recorded on a transaction card, such as the information identified by Valliani, when transferred to a remote transaction server for processing a commercial transaction would meet the limitation.

As Dr. Shamos testifies, “Valliani discloses that its device is for credit cards transactions, in which the device reads the information from the magnetic stripe (or smartcard) and communicates with a remote host system via a mobile device to process a transaction for which the card is being used.” Ex. 1017 ¶ 14 (citing Ex. 1005, 2:55–3:5). Dr. Shamos further testifies, and we agree, “[a] credit card transaction is a commercial transaction. From this description of Valliani’s purpose and process, [a person of ordinary skill in the art] would have understood Valliani as *effecting a commercial transaction* between the module 200 and the remote host server 75 via the mobile device 10.” Ex. 1017 ¶ 14.

Based on the complete record and for the reasons discussed herein, we are persuaded that Petitioner has demonstrated that Valliani teaches a communication device (device 10) that transmits recorded information (mag stripe 220 contains information such as card owner’s credit account company, account number, and owner identification) to a remote transaction server (remote host system 75) for processing a commercial transaction (credit card transaction) as recited in claim 1. We are also persuaded that Vrotsos teaches a communication device (wireless communication device 1) that transmits recorded information (encrypted transaction data) to a remote

transaction server (remote computer/server 101) for processing a commercial transaction as recited in claim 1.

ii. Rationale to Combine Valliani and Vrotsos

For limitations 1.C, 1.E.3, and 1.E.4, Petitioner argues a combination of Valliani and Vrotsos in addition to the arguments Petitioner provides for Valliani and Vrotsos separately. *See* Pet. 27–32, 35–40.

Limitation 1.C recites “a controller coupled to said sensor for converting the recorded information stored on said transaction card into a format suitable for transmission to a communication device.” Petitioner argues,

[t]o the extent Valliani does not provide a specific configuration of the module 200 that performs that *converting for transmission*, [a person of ordinary skill in the art] would have been motivated to look to Vrotsos to provide further detail of how to *convert said recorded information into a format suitable for transmission*.”

Pet. 31.

Specifically, Petitioner argues, a person of ordinary skill in the art “would have found it obvious to implement the *controller* of Valliani’s electronics 210 to include the functionality of Vrotsos’s processor 303 to *convert[] the recorded information into a format suitable for transmission* to the device 10.” *Id.* (citing Ex. 1003 ¶¶ C67, C77). Petitioner argues that “Vrotsos discloses a specific configuration that provides the same function described by Valliani.” Pet. 32 (citing Ex. 1003 ¶ C77). Petitioner argues that “Vrotsos even contemplates that any ‘type[] of serial or parallel interface connectors connects may be used’ (Ex. 1006 ¶ 43), including Valliani’s PCMCIA interface.” *Id.* at 32 (citing Ex. 1003 ¶¶ C75–76).

Petitioner also argues a person of ordinary skill in the art

“would have known that transmission to a communication device would not have been realistic if the transmitted information was not converted to a *format suitable for transmission* to that device, and therefore [a person of ordinary skill in the art] would have known to use a *controller* to perform that conversion.” Pet. 32 (citing Ex. 1003 ¶ C77). Thus, Petitioner argues, a person of ordinary skill in the art “applying Vrotsos’s teaching to Valliani would have expected to yield the predictable result of success.” Pet. 32.

Limitation 1.E.3 recites “[said controller] transmits said recorded information via the communication link to said communication device.” Petitioner argues it would have been obvious “to implement the electronics in Valliani’s magnetic stripe reader 210 to include the functionality of Vrotsos’s processor 303, which converts the *recorded information into a format suitable for transmission to a communication device*, such as Valliani’s device 10.” *Id.* at 35. Petitioner argues:

[i]n Vrotsos, the processor 303 also transmits the *recorded information* to the communication device. Specifically, Vrotsos discloses “[t]he communications interface 311 may transmit information from the attachment processor 303 . . . to a wireless communication device 1 such as a cellular phone or a personal digital assistant.” Ex. 1006 ¶ 80. Applying the functionality of Vrotsos’s processor 303 to Valliani’s electronics would have enabled the electronics in the magnetic stripe reader 210 to *transmit said recorded information via the PCMCIA interface, corresponding to the communication link, to said communication device*.

Pet. 35–36 (citing Ex. 1003 ¶¶ C95–97).

Limitation 1.E.4 recites “said communication device transmits said recorded information to a remote transaction server for processing a commercial transaction.” Petitioner argues a person of ordinary skill in the art “would have been motivated to incorporate Vrotsos’s teachings of the

communication device transmits said recorded information to a remote transaction server to Valliani's device 10, in order to enable the host system 75 to process the commercial transaction." Pet. 39–40. As Petitioner explains, Valliani's:

host system 75 determines the known PIN value based on the account number associated with the card. Ex. 1003 ¶ C114. It would have been obvious that the account data stored on the card should be transmitted to the host system 75 in the same manner as the explicitly disclosed fingerprint token PIN as both data are read by the same reader device. In addition to the PIN value(s), the magnetic stripe data would have been transmitted to Valliani's host system 75 for the host system 75 to properly compare and validate the PIN values. A [person of ordinary skill in the art] would have been further motivated to combine Vrotsos's specific disclosure of *transmit[ting] the recorded information to a remote transaction server* with Valliani's system, at least because Vrotsos generally complements Valliani.

Id. at 40 (citing Ex. 1003 ¶¶ C98–114).

Patent Owner argues that Petitioner does not provide “any analysis of how incorporating the element from Vrotsos would physically happen, what that would mean for any elements in Valliani that might have provided a similar function, or how the two references would actually work together.”

PO Resp. 23–24. Patent Owner also argues that “it is not clear what becomes of the electronics in Valliani's reader module that Petitioner also suggests could comprise the claimed controller—i.e., whether they are replaced entirely or share functionality with the Vrotsos controller.” *Id.* at 24–25. Patent Owner further argues that a person of ordinary skill in the art would understand that “no aspects of Vrotsos' converting or communicating data between its reader and cell phone (e.g., RS232 link) are compatible with Valliani's reader and communication device (PCMCIA Bus)” (*id.* at 25–26 (citing Ex. 2004 ¶ 63)), and that a person of ordinary skill in the art “would

not consider combining Valliani with any reference that does not disclose a PCMCIA compatible solution” (PO Resp. 27 (citing Ex. 2004 ¶ 67)).

As an example of Valliani’s purported incompatibility with Vrotsos, Patent Owner argues that “Valliani’s PCMCIA interface requires a 68-pin electrical connection using a parallel communication protocol,” while “Vrotsos can use a 4 pin RS-232 connection and a serial communication protocol.” PO Resp. 27–28 (citing Ex. 2004 ¶ 68). “Vrotsos,” Patent Owner argues, “neither mentions nor implies the use of any device standards or architecture, and none of its disclosed embodiments or figures appear to be PCMCIA-compliant.” PO Resp. 28 (citing Ex. 2004 ¶ 69; Ex. 1005, Abstr., 2:48–52, 4:50–57). “[T]o combine almost any aspect of Vrotsos with Valliani,” Patent Owner argues, “would require significant overall of the Vrotsos design in order to comply with the limitations of the ’107 claims.” PO Resp. 29.

We disagree with Patent Owner that Petitioner fails to explain sufficiently how and why a person of ordinary skill in the art would have combined the teachings of Valliani and Vrotsos in the manner described by Petitioner. Patent Owner criticizes, but fails to address, the asserted combination proffered by Petitioner, while largely ignoring the evidence that many of these technologies, including transaction cards, smart cards, control processors, signal processing and conversion, communication links and networks, and wireless transmission, were pre-existing and well-known technologies in the art at the time of the invention. *See, e.g.*, Ex. 1003 ¶¶ 35–37. For example, the ’107 patent points out that “[e]lectronic fund transfer over mobile phones is growing popular. Many systems include combining a point of sale (POS) device with a wireless communication

device such as a cell phone.” Ex. 1001, 1:41–44. The ’107 patent goes on to explain that:

These [prior art] POS devices include a processor as well as an input device to receive and process information from a transaction card such as a debit card, a credit card, a cash card, a stored value card, an ATM card or combinations thereof and the like. The input device may include a bar code reader, a magnetic stripe reader, an integrated circuit reader, a smartcard reader, a fingerprint scanner, an optical scanner, a signature pad, an alphanumeric keypad (including a PIN pad), a proximity detector, an audio recording device, a camera or combinations thereof and the like.

Id. at 1:45–54.

The ’107 patent even explains how these prior art systems largely work:

The processor of the POS device receives information from the transaction card and sends it to a remote computer via a communication network. This information can be transmitted by the processor via the wireless communication device. The wireless communication device includes a transceiver, a communication port or any other type of similar communication device capable of transmitting information received by the portable transaction device processor from the transaction card to the remote computer. The communication link between the remote computer and the wireless communication device can be provided by the processor of the wireless communication device.

Id. at 1:54–66.

Moreover, Patent Owner does not appear to take into account the level of skill of someone of ordinary skill in the art, here, a person with a bachelor’s degree in electrical or computer engineering or equivalent having one to two years of relevant experience in the fields of embedded systems and mobile communication device interfaces, or otherwise equivalent industry experience in the field. *See* Section II.A, *supra*.

Given this background and level of ordinary skill in the art, Patent Owner's criticism that Petitioner has not articulated how combining Valliani and Vrotsos would physically happen or how the two references would actually work together is unavailing. For example, Patent Owner argues that "Valliani's PCMCIA interface requires a 68-pin electrical connection using a parallel communication protocol," while "Vrotsos can use a 4 pin RS-232 connection and a serial communication protocol" (*id.* at 27–28). Patent Owner's argument is nonresponsive to Petitioner's proposed combination. Petitioner is not proposing to physically combine Vrotsos' 4-pin connector and serial communication protocol with Valliani's 86-pin connector and parallel communication protocol. "[I]t is not necessary that the inventions of the references be physically combinable to render obvious the invention under review." *In re Sneed*, 710 F.2d 1544, 1550, 218 USPQ 385, 389 (Fed. Cir. 1983); "Combining the teachings of references does not involve an ability to combine their specific structures." *In re Nievelt*, 482 F.2d 965, 179 USPQ 224, 226 (CCPA 1973).

Rather, Petitioner is proposing adding the functionality of Vrotsos's processor 303 to the controller of Valliani's electronics 210 to convert the recorded information into a format suitable for transmission to Valliani's device 10. *See, e.g.*, Pet. 31, 35–36. Dr. Shamos testifies that "Vrotsos discloses at least two different ways of converting information read from a smartchip card into a format suitable for transmission to [a] wireless communication device." Ex. 1003 ¶¶ 71–72, 95–97. Dr. Shamos also testifies that a person of ordinary skill in the art "would have known to use a controller (either a specialized hardware circuit or software running on a processor, either of which is the claimed controller) to perform the claimed

conversion. Vrotsos discloses a specific configuration that provides the same function described by Valliani to include such a controller.” *Id.* ¶ 77.

Also, to the extent necessary, Petitioner is proposing incorporating Vrotsos’s teachings of a communication device transmitting recorded information to a remote transaction server to Valliani’s device 10 in order to enable Valliani’s remote host system 75 to process the commercial transaction. *See* Pet. 39–40; *see also* Ex. 1003 ¶¶ 104–108. As Dr. Shamos testifies, “[t]he system in Vrotsos sends transaction transmission to a server over a wireless communications network using wireless protocols and such transaction transmission includes transaction data from the card 230.” *Id.*

¶ 107. Dr. Shamos also testifies that a person of ordinary skill in the art:

would have been motivated to apply the teachings of Vrotsos to Valliani’s system so that Valliani’s host system 75 could verify the card’s known PIN and process the commercial transaction. This would be impossible without a transmission from the mobile device to the remote server that includes either the account number to look up the known token PIN or the token PIN previously saved on the magnetic stripe 220. The application of Vrotsos’s teachings would have been straightforward to a [person of ordinary skill in the art] and would have achieved predictable results (i.e., allowing the remote host to verify the card data while protecting that card data from the user of the PDA). Transmission of card data to a remote server for authorizing (processing) a transaction was a necessary step in credit card processing and would have been obvious in light of the transmission of the fingerprint token PIN in the same manner. Thus, this limitation 1.e.4 is disclosed by both Valliani and Vrotsos and would have been obvious in view of Valliani and Vrotsos.

Ex. 1003 ¶ 114.

“Under the correct [obviousness] analysis, any need or problem known in the field of endeavor at the time of invention and addressed by the

patent can provide a reason for combining the elements in the manner claimed.” *KSR Int’l Co. v. Teleflex Inc.*, 550 U.S. 398, 420 (2007). Often, the strongest rationale for combining references is a recognition that some advantage or expected beneficial result would have been produced by their combination. *See, e.g., Novartis AG v. Torrent Pharms. Ltd.*, 853 F.3d 1316, 1326 (Fed. Cir. 2017); *Dystar Textilfarben GmbH & Co. Deutschland KG v. C.H. Patrick*, 464 F.3d 1356 (Fed. Cir. 2006); *In re Sernaker*, 702 F.2d 989, 994–95 (Fed. Cir. 1983).

To the extent Valliani’s teaching of communication device 10 transmitting recorded card information to remote host system 75 for processing a commercial transaction is inadequate to meet the claim limitation, Petitioner proposes adding Vrotsos’s teaching of this process to Valliani’s device 10 in order to enable Valliani’s remote host system 75 to properly process the commercial transaction. We find that Petitioner’s explanation of combining the teachings of Vrotsos and Valliani to enable the successful conversion of the recorded card information in a manner that Valliani’s host system 75 could verify the card’s known PIN and successfully process the commercial transaction to be a sufficient rationale for combining the teachings of Valliani and Vrotsos in the manner proffered by Petitioner and that a ordinarily skilled artisan would have had a reasonable expectation of successfully doing so.

We therefore find that Petitioner has shown persuasively by a preponderance of the evidence that one of ordinary skill in the art at the time of the invention would have been motivated to combine the teachings of Valliani and Vrotsos in the manner proffered by Petitioner with respect to limitations 1.C, 1.E.3, and 1.E.4.

iii. Conclusion as to Claim 1

Based upon consideration of the entire record, we are persuaded by Petitioner's arguments and evidence, notwithstanding Patent Owner's arguments, and determine that Petitioner has demonstrated by a preponderance of the evidence that independent claim 1 is unpatentable under 35 U.S.C. § 103(a) as obvious over Valliani and Vrotsos.

iv. Dependent Claim 2

Claim 2 depends from independent claim 1 and further recites, "[a]n apparatus according to claim 1, wherein the transaction card is selected from the group consisting of a debit card, a credit card, a cash card, a stored value card, an ATM card and any combination thereof."

Petitioner asserts that Valliani discloses its transaction card is a credit card and reads data from a magnetic stripe on credit card 230. Pet. 41 (citing Ex. 1003 ¶ C116–117; *see also* Ex. 1005, 4:38–42). Petitioner also asserts that Vrotsos discloses that its transaction card is a credit card. Pet. 41 (citing ¶¶ C118–120; *see also* Ex. 1006 ¶ 25, Figs. 1E, 12).

Patent Owner does not respond to Petitioner's arguments and evidence with respect to claim 2. *See* PO Resp. 10–29.

We are persuaded that Valliani (card 230) and Vrotsos (card 51) each separately teach "wherein the transaction card is selected from the group consisting of a debit card, a credit card, a cash card, a stored value card, an ATM card and any combination thereof" as recited in dependent claim 2.

Based upon consideration of the entire record, we are persuaded by Petitioner's arguments and evidence and determine that Petitioner has demonstrated by a preponderance of the evidence that dependent claim 2 is unpatentable under 35 U.S.C. § 103(a) as obvious over Valliani and Vrotsos.

v. *Dependent Claim 3*

Claim 3 depends from independent claim 1 and further recites, “[a]n apparatus according to claim 1, wherein said recorded information transmitted via the communication link to said communication device is encrypted.”

Petitioner asserts that Valliani discloses a *communication link* for transmission of *recorded information* and that Valliani further discloses that the *recorded information* is *encrypted* before transmission. Pet. 42. “Specifically,” Petitioner argues, “Valliani’s module 200 includes software for ‘data encryption.’” *Id.* at 41 (citing Ex. 1005, 3:1–10). “In Valliani,” Petitioner argues, “the module 200 includes ‘[a]dditional software [that] can also provide data encryption.’” Pet. 41 (citing Ex. 1005, 3:7–8, Abstr.; *see also* Ex. 1003 ¶¶ C121–124).

Petitioner also argues, “[t]o the extent that Valliani does not explicitly describe the *recorded information transmitted via the communication link* as being *encrypted*, it would have been obvious and straightforward to a [person of ordinary skill in the art] to encrypt the information read from the magnetic stripe of a card, because such an implementation was well known.” Pet. 41–42 (citing Ex. 1003 ¶ C125). “As one example,” Petitioner argues, “Vrotsos discloses *recorded information transmitted via the communication link to said communication device is encrypted*.” Pet. 42.

Petitioner argues that:

Vrotsos’s processor 303 encrypts the information stored on a credit card 51, such that the *recorded information is encrypted*. Specifically, “the processor 303 of the attachment 21 may encrypt input information received from the attachment’s input device 308.” Ex. 1006 ¶ 78, *see also id.* ¶¶ 94, 80 (“[t]he processor 303 may also include software or code that enables or executes encryption processing on any transaction data or

identification data. In an embodiment of the invention, the encryption is performed before the data is transmitted to the communication interface 311”). That information is encrypted by the attachment 21 before the information is transmitted to the communication device: “[t]he attachment 21 may encrypt the transaction data captured by the reader 23. The attachment 21 may transmit the encrypted transaction data to the wireless communication device 1 over the localized communications network 555 using a local or localized wireless protocol.” Ex. 1006 ¶ 52; *see* Ex. 1003 ¶¶ C125–131.

Pet. 42.

Petitioner also argues that a person of ordinary skill in the art “would have been motivated to incorporate the encryption teachings of Vrotsos to Valliani’s module 200 to provide *recorded information* that is *encrypted* before being *transmitted via the communication link*.” Pet. 42. Petitioner argues:

[t]o prevent “unscrupulous users from storing and accessing sensitive information” such as the *recorded information*, encryption was well known and/or mandatory in the field of transaction cards. Ex. 1006 ¶ 78; Ex. 1003 ¶ C132. A [person of ordinary skill in the art] would have been motivated to apply Vrotsos’s teachings of encrypting card information to protect the data read in Valliani’s module 200 to provide encrypted data to the phone, thereby protecting the data from potential misuse by users of the phone and conforming to the relevant standards in the Payment Card Industry. *Id.* A [person of ordinary skill in the art] would have been further motivated to combine Vrotsos’s specific disclosure of a card reader encrypting data prior to transmitting the data with Valliani’s system, at least because Vrotsos generally complements Valliani, as explained in *supra* Section IX.A.1.e.ii. Accordingly, Petitioner refers to the motivation to combine Valliani’s and Vrotsos’s teachings in *supra* Section IX.A.1.e.ii. *See* Ex. 1003 ¶ C132–133.

Pet. 43.

Patent Owner asserts that “Valliani does not disclose a device that encrypts the recorded information before sending it on to the communication device.” PO Resp. 19 (citing Ex. 2004 ¶ 52). Patent Owner argues that in Valliani, “[t]he only encryption that is explicitly described as happening in module 200 is when PIN data is manually entered by the user at the keypad and then encrypted. PO Resp. 20 (citing Ex. 1005, 6:25–35). “Therefore,” Patent Owner argues, “Valliani does not transmit a signal containing encrypted information representing information stored on the transaction card.” PO Resp. 21. Patent Owner does not respond directly to Petitioner’s arguments and evidence that Vrotsos teaches the recited limitation.¹¹ *Id.*

We disagree with Patent Owner. Valliani explains that there is a need for point of sale transaction systems that can “perform the necessary functions required to securely transact business.” Ex. 1005, 2:34–37. Valliani also explains that “[a]dditional software can also provide data encryption.” Ex. 1005, 3:7–8. Valliani expressly states that “[t]o promote security, *electronics 210 provides any card 230-provided PIN information to device 10 in encrypted form only using internally stored encryption keys.*” *Id.* at 5:32–35 (emphasis added).

Patent Owner’s argument that “Valliani does not disclose broad encryption of ‘recorded information’ on the payment device in module 200 of the transaction terminal” (PO Resp. 20), is unavailing because, as Petitioner points out, “[t]he claims only require the *transmitted recorded*

¹¹ Patent Owner’s arguments with respect to Vrotsos’ teaching of encryption are limited to arguments on the rationale for combining Valliani and Vrotsos, which we discuss in Section. II.C.2.b.ii, *supra*.

information is encrypted, not that any specific claimed component perform the encryption) (Pet. Reply 12 (citing Ex. 1017 ¶¶ 8–13)).

A person of ordinary skill in the art reading these disclosures in Valliani would understand that Valliani’s invention addresses a need for point of sale transaction systems to perform secure business transactions. One way Valliani addresses this need is to provide “[a]dditional software [that] can also provide data encryption.” Ex. 1005, 3:7–8. Valliani’s data encryption software “provides any card 230-provided PIN information to device 10 in encrypted form only using internally stored encryption keys.” *Id.* at 5:32–35.

This understanding is confirmed by Dr. Shamos, who testifies that:

Valliani discloses storing PIN data in memory 225 on a card 230. The smart card reader/writer 260 (the claimed sensor) reads the data from the memory 225 (4:45–47), and the electronics 210, which is coupled to the smart card reader/writer 260, converts that data into an encrypted signal indicative of the PIN data. Further, Valliani teaches a module 200 plugged into a PDA 10 over a physical connection (e.g., the PCMCIA interface), and the module transmits encrypted PIN data to the PDA.

Ex. 1003 ¶ C124.

Dr. Shamos also provides credible testimonial evidence that Vrotsos teaches transmitting encrypted information from a transaction card to a communication device through a communication link, which is unrebutted by Patent Owner. *See* Ex. 1003 ¶¶ C125–133.

We are persuaded that Valliani and Vrotsos each separately teach “wherein said recorded information transmitted via the communication link to said communication device is encrypted,” as recited in dependent claim 3. We are also persuaded that a person of ordinary skill in the art would have appreciated the benefit of protecting card information from potential misuse

by applying Vrotsos's teachings of encrypting card information to protect data read by Valliani's module 200 to provide encrypted data to the phone.

Based upon consideration of the entire record, we are persuaded by Petitioner's arguments and evidence and determine that Petitioner has demonstrated by a preponderance of the evidence that dependent claim 3 is unpatentable under 35 U.S.C. § 103(a) as obvious over Valliani and Vrotsos.

vi. Dependent Claim 4

Claim 4 depends from independent claim 1 and further recites, “[a]n apparatus according to claim 1, wherein the communication link comprises a link selected from the group consisting of a wired connection, a wireless connection, an analog channel, a digital channel, Bluetooth connection, a USB connection, a Wi-Fi connection and any combination thereof.”

Petitioner asserts that:

Valliani discloses a PCMCIA interface, which is *the communication link* between the module 200 and the device 10. Specifically, Valliani describes the “module 200 will provide a projecting snoutlike member 280 that includes a connector edge 265 that slides into and matingly engages slot socket 90 in device 10.” Ex. 1005, 4:51–54; 4:23–28; 4:50–57. Accordingly, the *communication link* is a *wired connection*. See Ex. 1003 ¶¶ C134–139.

Pet. 43–44.

Petitioner also asserts that “Vrotsos discloses an embodiment in which the communication link is a wireless connection over Bluetooth or Wi-Fi. Accordingly, Vrotsos also discloses this limitation.” Pet. 44 (citing Ex. 1006 ¶ 32; Ex. 1003 ¶ C140–142).

Patent Owner does not respond to Petitioner's arguments and evidence with respect to claim 4. See PO Resp. 10–29.

We are persuaded that Valliani (PCMCIA interface) and Vrotsos (Bluetooth or Wi-Fi) each separately teach “wherein the communication link comprises a link selected from the group consisting of a wired connection, a wireless connection, an analog channel, a digital channel, Bluetooth connection, a USB connection, a Wi-Fi connection and any combination thereof,” as recited in dependent claim 4.

Based upon consideration of the entire record, we are persuaded by Petitioner’s arguments and evidence and determine that Petitioner has demonstrated by a preponderance of the evidence that dependent claim 4 is unpatentable under 35 U.S.C. § 103(a) as obvious over Valliani and Vrotsos.

vii. Dependent Claim 5

Claim 5 depends from independent claim 1 and further recites, “[a]n apparatus according to claim 1, wherein said communication device receives transaction validation information from said remote transaction server.”

Petitioner argues:

[i]n Valliani, when the host system 75 validates the user’s PIN, the device 10, corresponding to *said communication device*, receives *transaction validation information* from the host system 75, indicating that the transaction is allowed to proceed. Specifically, as stated in Section IX.A.1.j, the host system 75 is the *remote transaction server* that compares the transaction-generated fingerprint token PIN to the known token PIN (read from the card). Ex. 1005 7:17–21. If the transaction-generated fingerprint token PIN matches the known token PIN the host server 75 receives from the card 230, the transaction is allowed to proceed. Ex. 1005, 7:17–21; *see supra* Section IX.A.1.j. Accordingly, Valliani’s *communication device receives transaction validation information from the host system 75*. *See* Ex. 1003 ¶¶ C144–147.

Pet. 44.

Petitioner also argues:

[t]o the extent Valliani does not explicitly disclose *the communication device receives transaction validation information from said remote transaction server*, Vrotsos discloses this limitation. Vrotsos describes a server or remote computer 101 transmitting a transaction response to a wireless communication device 1 (Ex. 1006 ¶ 54). The transaction response can be a “confirmation number or approval number.” *Id.* The response may also be “that the transaction could not be completed . . . or that additional information is required from the purchaser or user.” Ex. 1006 ¶ 96. That transaction response corresponds to *transaction validation information* that is received by the phone from the server. Accordingly, Vrotsos discloses this element. *See* Ex. 1003 ¶¶ C148–151.

Pet. 45.

Petitioner further argues a person of ordinary skill in the art:

would have been motivated to look for another reference in the mobile payment processing space that provides details of a process that provides a receipt of transaction validation to the user. Vrotsos provides those details. Thus, a [person of ordinary skill in the art] would have found it obvious to incorporate Vrotsos’s teachings into Valliani in order to inform the user that the transaction has been validated and is allowed to proceed. *See* Ex. 1003 ¶¶ C79–80. It would have been obvious and straightforward to a [person of ordinary skill in the art] to provide that transaction validation information to Valliani’s device 10, both because it was usual and customary at the time to do so, and because Vrotsos explicitly discloses providing a transaction response to the wireless device. Ex. 1003 ¶ C149. A [person of ordinary skill in the art] would have been further motivated to combine Vrotsos’s specific disclosure of *the communication device receives transaction validation information from said remote transaction server* with Valliani’s system, at least because Vrotsos generally complements Valliani, as explained in *supra* Section IX.A.1.e.ii. Accordingly, Petitioner refers to the motivation to combine Valliani’s and Vrotsos’s teachings in *supra* Section IX.A.1.e.ii. *See* Ex. 1003 ¶¶ C79–80.

Pet. 45–46.

Patent Owner argues that Valliani does not teach this limitation because “Valliani does not process a commercial transaction,” and Valliani’s “PIN validation is [not] equivalent to transaction validation.” PO Resp. 21–22. Patent Owner argues that “[t]here is much more information that must be exchanged and processed for a commercial transaction to be deemed validated and completed.” *Id.* at 21 (citing Ex. 2004 ¶ 55). Patent Owner does not respond directly to Petitioner’s arguments and evidence that Vrotsos teaches the recited limitation.¹² *Id.* at 22–23.

We disagree with Patent Owner. The limitation recites “wherein said communication device *receives transaction validation information* from said remote transaction server.” It does not recite “wherein said communication device *receives transaction validation and completion information* from said remote transaction server.” Indeed, the ’107 patent explains that “validation information” is sent when a “remoter [sic] processor/issuer 20... accept[s] or den[ies] the request and sends this validation information to the transaction server 18 which then... provid[es] the seller and buyer with a confirmation or a rejection message.” Ex. 1001, 7:24–30. Completion of a commercial transaction with money transfer is not required for validation. This is comparable to the PIN validation process described by Valliani. *See* Ex. 1005, 7:17–21. Dr. Shamos provides credible testimonial evidence confirming this understanding. *See* Ex. 1003 ¶¶ C144–147.

Dr. Shamos also provides credible testimonial evidence that Vrotsos teaches this limitation. *See* Ex. 1003 ¶¶ C148–151.

¹² Patent Owner’s arguments with respect to Vrotsos are limited to arguments concerning a rationale to combine Valliani and Vrotsos, which we discuss in Section. II.C.2.b.ii, *supra*.

We are persuaded that Valliani and Vrotsos each separately teach “wherein said communication device receives transaction validation information from said remote transaction server,” as recited in dependent claim 5.

Moreover, we also agree with Petitioner that a person of ordinary skill in the art would have been motivated to combine Vrotsos’ teaching of server 101 sending a confirmation number, approval number, or other responsive information with Valliani to provide transaction validation information to Valliani’s device 10 in order to inform a user that a transaction has been approved and allowed to proceed. *See* Pet. 45–46; Ex. 1003 ¶¶ 149–150.

Based upon consideration of the entire record, we are persuaded by Petitioner’s arguments and evidence and determine that Petitioner has demonstrated by a preponderance of the evidence that dependent claim 5 is unpatentable under 35 U.S.C. § 103(a) as obvious over Valliani and Vrotsos.

viii. Dependent Claim 6

Claim 6 depends from independent claim 1 and further recites, “[a]n apparatus according to claim 1, wherein the communication device comprises a device selected from a wireless communication device, a landline phone, a mobile phone, a cellular phone, a personal digital assistant (PDA), a pager computer, a Smart Phone™, a Blackberry™, an iPhone™, an iPad™ and a tablet.”

Petitioner asserts that “Valliani discloses the *communication device* as a *personal digital assistant*, PDA 10.” Pet. 46 (citing Ex. 1005, 1:19–20). Petitioner also asserts that “Vrotsos similarly discloses this claim.” Pet. 46 (citing Ex. 1003 ¶¶ C152–156; *see also* Ex. 1006 ¶ 27).

Patent Owner does not respond to Petitioner’s arguments and evidence with respect to claim 6. *See* PO Resp. 10–29.

We are persuaded that Valliani (PDA 10) and Vrotsos (telephone, PDA, pager, computer or other device capable of sending and receiving signals over a wireless communication network) each separately teach “wherein the communication device comprises a device selected from a wireless communication device, a landline phone, a mobile phone, a cellular phone, a personal digital assistant (PDA), a pager computer, a Smart Phone™, a Blackberry™, an iPhone™, an iPad™ and a tablet,” as recited in dependent claim 6.

Based upon consideration of the entire record, we are persuaded by Petitioner’s arguments and evidence and determine that Petitioner has demonstrated by a preponderance of the evidence that dependent claim 6 is unpatentable under 35 U.S.C. § 103(a) as obvious over Valliani and Vrotsos.

ix. Independent Claim 22

Independent claim 22 is substantially similar to independent claim 1, except that claim 22 recites a method whereas claim 1 recites an apparatus.

Here, both Petitioner and Patent Owner rely on the same evidence and arguments for claim 22 as they did for claim 1. *See* Pet. 47–48; PO Resp. 10–29; Pet. Reply 3–20; PO Sur-reply 2–13.

Based upon consideration of the entire record we are persuaded by Petitioner’s arguments and evidence, notwithstanding Patent Owner’s arguments. For the reasons discussed with respect to claim 1, we determine that Petitioner has demonstrated by a preponderance of the evidence that independent claim 22 is unpatentable under 35 U.S.C. § 103(a) as obvious over Valliani and Vrotsos.

x. Dependent Claims 23–27

Claims 23–27 are substantially similar to claims 2–6, except that claims 23–27 depend from independent claim 22 whereas claims 2–6 depend

from independent claim 1. Petitioner relies on the same evidence for claims 23–27 as it relies on for corresponding claims 2–6. *See* Pet. 48–49. Patent Owner does not address claims 23–27 differently than how it addresses claims 2–6. *See* PO Resp. 10–29.

Based upon consideration of the entire record, and for the reasons stated, *supra*, with respect to dependent claims 2–6, we are persuaded by Petitioner’s arguments and evidence, notwithstanding Patent Owner’s arguments, and determine that Petitioner has demonstrated by a preponderance of the evidence that dependent claims 23–27 are unpatentable under 35 U.S.C. § 103(a) as obvious over Valliani and Vrotsos.

c. Obviousness over Valliani, Vrotsos, and Bryant

Claim 7 depends from independent claim 1 and further recites “[a]n apparatus according to claim 1, further comprising a stand operative to support the input device and communication device.” Claim 28 is substantially similar, but depends from independent claim 22.

Petitioner asserts the combination of Valliani, Vrotsos, and Bryant teaches or suggests the recited limitations of dependent claims 7 and 28. *See* Pet. 49–53. Petitioner argues that Bryant discloses a telephone stand with flexible attaching arms that, when combined with the teachings Valliani and Vrotsos, teaches or suggests the limitations of these claims. *Id.* at 52–53.

Petitioner also provides argument and evidence for a motivation to combine the teachings of Bryant with that of Valliani and Vrotsos. *See id.* at 52–53. For example, Petitioner argues it would have been obvious to a person of ordinary skill in the art “to use Bryant’s *stand* to support the device 10 and module 200 by causing the attaching arms 160 to clinch the long edges of Valliani’s device 10, while the module 200 is positioned either at the base or at the top of the device 10. This way, the credit card could be

swiped horizontally without any obstruction.” *Id.* (citing Ex. 1003 ¶¶ C161–164). Petitioner also argues that “it would have allowed the user to ‘easily and quickly read the telephone display at any time’ as contemplated by Bryant (*id.* 1:43–44), and access both the display on the device 10 as well as the magnetic card reader slot on the module 200 without obstruction.” Pet. 53 (citing Ex. 1003 ¶ C165).

Patent Owner argues that “[f]or the same reasons that claims 1 and 22 are not obvious over Valliani and Vrotsos, set forth above with respect to Ground 1, claims 7 and 28 are not obvious over those references combined with Bryant.” PO Resp. 29 (citing Ex. 2004 ¶ 71).

Patent Owner’s argument is unavailing for the same reasons discussed *supra* with respect to claims 1 and 22.

We are persuaded that Bryant teaches a stand (Bryant’s stand 100) operative to support an input device (Valliani’s module 200) and a communication device (Valliani’s device 10), as recited in dependent claims 7 and 28 and find that Petitioner has articulated adequate reasoning to apply that teaching of Bryant to the combined teachings of Valliani and Vrotsos.

Based upon consideration of the entire record, and for the reasons stated, *supra*, with respect to independent claims 1 and 22, we are persuaded by Petitioner’s arguments and evidence and determine that Petitioner has demonstrated by a preponderance of the evidence that dependent claims 7 and 28 are unpatentable under 35 U.S.C. § 103(a) as obvious over the combination of Valliani, Vrotsos, and Bryant.

3. *Grounds Based on Proctor*

Petitioner asserts that claims 1–6 and 22–27 are obvious over the combined teachings of Proctor (Ex. 1008) and Vrotsos. *See* Pet. 53–72. Petitioner also asserts that claims 7 and 28 are obvious over the combined

teachings of Proctor, Vrotsos and Bryant. *See* Pet. 72–74. However, because Petitioner has shown that all the challenged claims are unpatentable based on the combined teachings of Valliani, Vrotsos and, Bryant, we do not reach the additional asserted grounds based on Proctor, Vrotsos, and Bryant. *See Beloit Corp. v. Valmet Oy*, 742 F.2d 1421, 1423 (Fed. Cir. 1984) (“The Commission . . . is at perfect liberty to reach a ‘no violation’ determination on a single dispositive issue.”); *Boston Sci. Scimed, Inc. v. Cook Grp. Inc.*, 809 F. App’x 984, 990 (Fed. Cir. 2020) (recognizing that “[t]he Board has the discretion to decline to decide additional instituted grounds once the petitioner has prevailed on all its challenged claims”).

D. Appointments Clause

Patent Owner argues that the appointment of Administrative Patent Judges (“APJs”) of the Patent Trial and Appeal Board by the Secretary of Commerce “is not constitutional under the Appointments Clause.” PO Resp. 38. Patent Owner also argues that the Federal Circuit’s “attempted cure of the Constitutional violation” in *Arthrex, Inc. v. Smith & Nephew, Inc.*, 941 F.3d 1320 (Fed. Cir. 2019), “is insufficient, because it does not give a constitutionally appointed principal officer the power to review APJ decisions.” PO Resp. 39. We decline to consider Patent Owner’s constitutional challenge as the Federal Circuit addressed this issue in *Arthrex*, 941 F.3d at 1325.

E. Due Process

Patent Owner argues that “subjecting a patent effectively filed before September 16, 2012 (when the relevant provisions of the AIA went into effect), as is the case here, to IPR is an impermissibly retroactive, unconstitutional taking” and “violates the Due Process Clause of the Fifth Amendment.” PO Resp. 39. We decline to consider Patent Owner’s constitutional challenge as the Federal Circuit addressed this issue in *Celgene Corp. v. Peter*, 931 F.3d 1342, 1362–63 (Fed. Cir. 2019).

III. CONCLUSION

For the foregoing reasons, we determine that Petitioner has demonstrated by a preponderance of the evidence that claims 1–7 and 22–28 of the '107 patent are unpatentable on the bases set forth in the following table.¹³

Claims	35 U.S.C. §	References	Claims Shown Unpatentable	Claims Not Shown Unpatentable
1–6, 22–27	103	Valliani, Vrotsos	1–6, 22–27	
7, 28	103	Valliani, Vrotsos, Bryant	7, 28	
1–6, 22–27	103	Proctor, ¹⁴ Vrotsos		
7, 28	103	Proctor, Vrotsos, Bryant		
Overall Outcome			1–7, 22–28	

¹³ Should Patent Owner wish to pursue amendment of the challenged claims in a reissue or reexamination proceeding subsequent to the issuance of this Final Decision, we draw Patent Owner's attention to the April 2019 *Notice Regarding Options for Amendments by Patent Owner Through Reissue or Reexamination During a Pending AIA Trial Proceeding*. See 84 Fed. Reg. 16,654 (Apr. 22, 2019). If Patent Owner chooses to file a reissue application or a request for reexamination of the challenged patent, we remind Patent Owner of its continuing obligation to notify the Board of any such related matters in updated mandatory notices. See 37 C.F.R. § 42.8(a)(3), (b)(2).

¹⁴ We do not reach the grounds including Proctor as a basis for unpatentability because each of the challenged claims is already held unpatentable on a different ground.

IV. ORDER

In consideration of the foregoing, it is hereby

ORDERED that Petitioner has demonstrated by a preponderance of the evidence that claims 1–7 and 22–28 of U.S. Patent No. 9,818,107 B2 are unpatentable; and

FURTHER ORDERED that because this is a Final Written Decision, any party to the proceeding seeking judicial review of this Decision must comply with the notice and service requirements of 37 C.F.R. § 90.2.

IPR2019-01653
Patent 9,818,107 B2

PETITIONER:

David M. Tennant
Grace I. Wang
WHITE & CASE LLP
dtennant@whitecase.com
grace.wang@whitecase.com

PATENT OWNER:

Jason S. Jackson
Niall A. MacLeod
KUTAK ROCK LLP
jason.jackson@kutakrock.com
niall.macleod@kutakrock.com