Trials@uspto.gov
571-272-7822

Paper 11
Date: June 13, 2023

UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE PATENT TRIAL AND APPEAL BOARD

SAMSUNG ELECTRONICS CO., LTD.,
Petitioner,

v.

CARDWARE, INC.,
Patent Owner.

IPR2023-00219
Patent 11,176,538 B2

Before BRIAN J. McNAMARA, ELIZABETH M. ROESEL, and SHARON FENICK, *Administrative Patent Judges.*

McNAMARA, *Administrative Patent Judge*.

DECISION
Denying Institution of *Inter Partes* Review
35 U.S.C. § 314

I. INTRODUCTION

Samsung Electronics Co., Ltd. ("Petitioner") filed a petition, Paper 2 ("Petition" or "Pet."), to institute an *inter partes* review ("IPR") of claims 1–21 and 23–30 (the "challenged claims") of U.S. Patent No. 11,176,538 B2 ("the '538 patent"). 35 U.S.C. § 311. CardWare, Inc. ("Patent Owner") filed a Preliminary Response, Paper 6 ("Prelim. Resp."), contending that the Petition should be denied as to all challenged claims. We have jurisdiction under 35 U.S.C. § 314, which provides that an *inter partes* review may not be instituted unless the information presented in the Petition "shows that there is a reasonable likelihood that the petitioner would prevail with respect to at least 1 of the claims challenged in the petition."

A decision to institute under § 314 may not institute on fewer than all claims challenged in the petition. *SAS Inst., Inc. v. Iancu*, 138 S. Ct. 1348, 1359–60 (2018). In addition, per Board practice, if the Board institutes trial, it will institute "on all of the challenged claims and on all grounds of unpatentability asserted for each claim." *See* 37 C.F.R. § 42.108(a).

Having considered the arguments and the associated evidence presented in the Petition and the Preliminary Response, for the reasons described below, we decline to institute *inter partes* review.[1]

II. REAL PARTIES IN INTEREST

The Petition identifies Samsung Electronics Co., Ltd. and Samsung Electronics America, Inc. as real parties-in-interest. Pet. 89. Patent Owner identifies itself (CardWare, Inc.) as the sole real party-in-interest. Paper 3, 1.

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[1] As we decline to institute *inter parties* review based on the merits of the Petition, this Decision does not address the parties' arguments concerning the exercise of discretion to deny institution.

III. RELATED MATTERS

The parties state that the '538 patent is asserted in the following litigation:

CardWare Inc. v. Samsung Electronics Co., Ltd. and Samsung Electronics America, Inc., Case No. 2:22-cv-00141, E. D. Tex. (filed May 11, 2022). Pet. 89, Paper 3, 1.

IV. THE '538 PATENT

The '538 patent concerns "secure, smart multi-function smart tokenizing electronic payment devices and transaction processing." Ex. 1001, 1:26–27. The '538 patent describes a multifunction electronic device that emulates the behavior of a standard credit card, debit card, or cash card when used in electronic card readers. *Id.* at 2:14–24. In one embodiment the apparatus includes a thin card-shaped and -sized body, a memory storing identification data, a processor, a user interface for selecting identification data, a magnetic card reader detection unit, an inductor assembly integrated into the body and controlled by the processor to generate an alternating polarity magnetic field with encoded identification data in a region encompassed by the card reader. *Id.* at 2:32–48. Another embodiment includes a keypad and touch sensor array with a display. *Id.* at 9:29–10:21, Figs. 4A–4B. The multi-function electronic device also includes a near field communication (NFC) unit, a touch sensor array, a display, a motion rate detection array, a memory storing user data and a currency amount, and a processor coupled to the NFC unit that initiates device to device transaction processing when a first device is proximate to a second device and the user inputs information via the touch screen array. *Id.* at 2:49–62.

The ’538 patent describes a transaction process in which the multifunction electronic device receives an input signal from a user that enables a near-field communication (NFC) unit of the device. *Id.* at 2:64–67. The transaction steps include receiving a currency amount of the transaction, generating at the device a limited-duration payment number, and transmitting the limited-duration payment number from the device to a recipient of the transaction. *Id.* at 2:67–3:4, Fig. 7. The limited-duration payment number is a security feature in the form of “a unique number [that] may be generated by the multi-function electronic device and verified by the payment authority according to the time stamp and the transmitted user information.” *Id.* at 10:29–33. “The limited-duration payment number is able to be produced at the time the multi-function electronic device is performing the transaction and is able to be generated according to the user’s private information, a bank information, information regarding the facility performing the transaction, and the time of day.” *Id.* at 10:34–39. In one embodiment the number displayed on the multi-function device is a static number. *Id.* at 10:53–57. The number displayed may also be dynamic, e.g., with the first and last four digits fixed and the remaining digits dynamically generated. *Id.* at 10:58–62. “As the device is read by the machine, part or a;; of the number may be dynamically produced at the time the device is read.” *Id.* at 10:62–64.

V. ILLUSTRATIVE CLAIM

Claim 1 (Ex. 1001, 19:35–20:29), reproduced below using the paragraph designations in the Petition, is illustrative of the subject matter of the ’538 patent.

> 1[pre]. A method of performing a payment transaction, the method comprising:

[1.a] receiving an input at an electronic device corresponding to a priming operation of the electronic device by an authorized user; and,

[1.b] wherein the authorizing of a user of the electronic device comprises recognizing a user input using a human input sensor, and wherein the human input sensor is any one of a touch sensor, a touch-screen display interface, a gesture sensor, a motion sensor, and a biometric sensor; and,

[1.c] receiving a request for a transaction payment at said electronic device via an NFC interface of the device; and,

[1.d] displaying, on a display of the device, a transaction payment request and at least a portion of an original static issuer-supplied payment account information associated with a payment method, for a user selection in paying the payment request; and,

[1.e] retrieving from a memory attached to a processor of the device, a device-specific static limited-use payment information, associated with said selected payment method; and,

[1.f] dynamically generating, by a processor of the device, device-specific limited-use payment information, for said selected payment method; and,

[1.g] using said limited-use payment information in place of at least a portion of said selected original issuer-supplied payment information for the transaction; and,

[1.h] combining of said dynamically-generated limited-use payment information with said static limited-use payment information, to generate a complete device payment information; and

[1.i] transmitting said complete device payment information from said electronic device to a recipient reader via said NFC interface to the recipient NFC reader for a processing of the payment transaction; and,

[1.j] receiving information at said electronic device corresponding to a transaction status of the payment transaction, wherein such transaction status is at least partly dependent on validation of the transmitted complete device payment information by a payment processor authority and a payment issuer authority; and,

[1.k] visually conveying the transaction payment authorization status via a user-interface displayed on said display.

VI. ASSERTED GROUNDS

Petitioner asserts that claims 1–21 and 23–30 would have been unpatentable on the following grounds:

Claim(s) Challenged	35 U.S.C. §	Reference(s)
1–18	103	Royyuru[2], Phillips[3], Casey[4]
5–6, 8–11, 13–17	103	Royyuru, Phillips, Casey, Rans[5]
19-21, 23-25, 28-30	103	Phillips, Royyuru, Casey
23, 28-30	103	Phillips, Royyuru, Casey, Rans
27	103	Phillips, Royyuru, Casey, Rans, Carlson[6]
26	103	Phillips, Royyuru, Casey, Law[7]

VII. LEVEL OF ORDINARY SKILL IN THE ART

Noting that "[a]dditional education could substitute for professional experience, or vice versa," Petitioner identifies a person of ordinary skill as one who "would have had (1) a bachelor's degree in computer science, computer engineering, electrical engineering, or a related field, and (2) one to two years of experience working with payment processing and/or digital authentication systems, including familiarity with short-range wireless technologies. Pet. 4–5 (citing Ex. 1003, Declaration of Dr. Michael I.

[2] U.S. Patent Publication No. 2010/0185545 to Royyuru et al. (Ex. 1004)
[3] U.S. Patent Publication No. 2012/0310760 to Phillips et al. (Ex. 1005)
[4] U.S. Patent No. 8,255,323 to Casey et al. (Ex. 1006)
[5] U.S. Patent Publication No. 2007/0278291 to Rans et al. (Ex. 1014)
[6] U.S. Patent Publication No. 2008/0319905 to Carlson (Ex. 1013)
[7] U.S. Patent Publication No. 2012/0150750 to Law et al. (Ex. 1015)

Shamos ("Shamos Decl.") ¶¶ 45–51. Patent Owner does not offer an alternative description of a person of ordinary skill.

The level of ordinary skill in the art usually is evidenced by the references themselves. *See Okajima v. Bourdeau*, 261 F.3d 1350, 1355 (Fed. Cir. 2001); *In re GPAC Inc.*, 57 F.3d 1573, 1579 (Fed. Cir. 1995); *In re Oelrich*, 579 F.2d 86, 91 (CCPA 1978). As Petitioner's proposed description of the level of ordinary skill appears consistent with the subject matter described and claimed in the '538 patent and the references, we apply Petitioner's proposed description in this Decision.

VIII. CLAIM CONSTRUCTION

We interpret claim terms using "the same claim construction standard that would be used to construe the claim in a civil action under 35 U.S.C. 282(b)." 37 C.F.R. § 42.100(b) (2022). In this context, claim terms "are generally given their ordinary and customary meaning" as understood by a person of ordinary skill in the art in question at the time of the invention. *Phillips v. AWH Corp.*, 415 F.3d 1303, 1312–13 (Fed. Cir. 2005) (citations omitted) (en banc). "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). Extrinsic evidence is "less significant than the intrinsic record in determining 'the legally operative meaning of claim language.'" *Phillips*, 415 F.3d at 1317 (citations omitted).

Any special definition for a claim term must be set forth in the specification with reasonable clarity, deliberateness, and precision. *In re Paulsen*, 30 F.3d 1475, 1480 (Fed. Cir. 1994).

We construe only those claim terms that require analysis to determine whether to institute inter partes review. *See Realtime Data, LLC v. Iancu*, 912 F.3d 1368, 1375 (Fed. Cir. 2019) ("The Board is required to construe 'only those terms . . . that are in controversy, and only to the extent necessary to resolve the controversy'" (quoting *Vivid Techs., Inc. v. Am. Sci. & Eng'g, Inc.*, 200 F.3d 795, 803 (Fed. Cir. 1999)). Neither party has proposed a special definition or explicit construction of any claim term. Although the parties' arguments discuss the meanings of certain claim terms, as discussed further herein, for purposes of this Decision, we do not construe any claim terms specifically.

IX. ANALYSIS

A. Legal Standards

"In an [*inter partes* review], the petitioner has the burden from the onset to show with particularity why the patent it challenges is unpatentable." *Harmonic Inc. v. Avid Tech., Inc.*, 815 F.3d 1356, 1363 (Fed. Cir. 2016) (citing 35 U.S.C. § 312(a)(3) (requiring inter partes review petitions to identify "with particularity . . . the evidence that supports the grounds for the challenge to each claim")). This burden of persuasion never shifts to Patent Owner. *See Dynamic Drinkware, LLC v. Nat'l Graphics, Inc.*, 800 F.3d 1375, 1378 (Fed. Cir. 2015) (discussing the burden of proof in *inter partes* review).

The question of obviousness is resolved on the basis of underlying factual determinations including: (1) the scope and content of the prior art; (2) any differences between the claimed subject matter and the prior art; (3) the level of ordinary skill in the art; and (4) when presented, objective evidence of nonobviousness. *Graham v. John Deere Co.*, 383 U.S. 1, 17–18 (1966). Additionally, the obviousness inquiry typically requires an analysis

of "whether there was an apparent reason to combine the known elements in the fashion claimed by the patent at issue." *KSR Int'l Co. v. Teleflex Inc.*, 550 U.S. 398, 418 (2007) (citing *In re Kahn*, 441 F.3d 977, 988 (Fed. Cir. 2006) (requiring "articulated reasoning with some rational underpinning to support the legal conclusion of obviousness")).

An obviousness analysis "need not seek out precise teachings directed to the specific subject matter of the challenged claim, for a court can take account of the inferences and creative steps that a person of ordinary skill in the art would employ." *KSR*, 550 U.S. at 418; *accord In re Translogic Tech., Inc.*, 504 F.3d 1249, 1259 (Fed. Cir. 2007). Petitioner cannot satisfy its burden of proving obviousness by employing "mere conclusory statements." *In re Magnum Oil Tools Int'l, Ltd.*, 829 F.3d 1364, 1380 (Fed. Cir. 2016). Instead, Petitioner must articulate a reason why a person of ordinary skill in the art would have combined the prior art references. *In re NuVasive*, 842 F.3d 1376, 1382 (Fed. Cir. 2016).

A reason to combine or modify the prior art may be found explicitly or implicitly in market forces; design incentives; the "'interrelated teachings of multiple patents'"; "'any need or problem known in the field of endeavor at the time of invention and addressed by the patent'"; and the background knowledge, creativity, and common sense of the person of ordinary skill. *Perfect Web Techs., Inc. v. InfoUSA, Inc.*, 587 F.3d 1324, 1328–29 (Fed. Cir. 2009) (quoting *KSR Int'l Co. v. Teleflex Inc.*, 550 U.S. 398, 418–21 (2007)).

In determining whether a claim is obvious in light of the prior art, when in evidence, we consider any relevant objective evidence of non-obviousness. *See Graham*, 383 U.S. at 17. Notwithstanding what the teachings of the prior art would have suggested to one of ordinary skill in the art at the time of the invention, the totality of the evidence submitted,

including objective evidence of non-obviousness, may lead to a conclusion that the challenged claims would not have been obvious to one of ordinary skill. *In re Piasecki*, 745 F.2d 1468, 1471–72 (Fed. Cir. 1984). At this stage of the proceeding Patent Owner does not present evidence of such objective considerations.

We analyze the asserted grounds of unpatentability in accordance with these principles to determine whether Petitioner has met its burden to establish a reasonable likelihood of success at trial.

B. Petitioner's challenge to Claims 1–18 as obvious over Royyuru, Phillips and Casey

1. *Royyuru (Ex. 1004)*

Figure 3 of Royyuru is shown below.

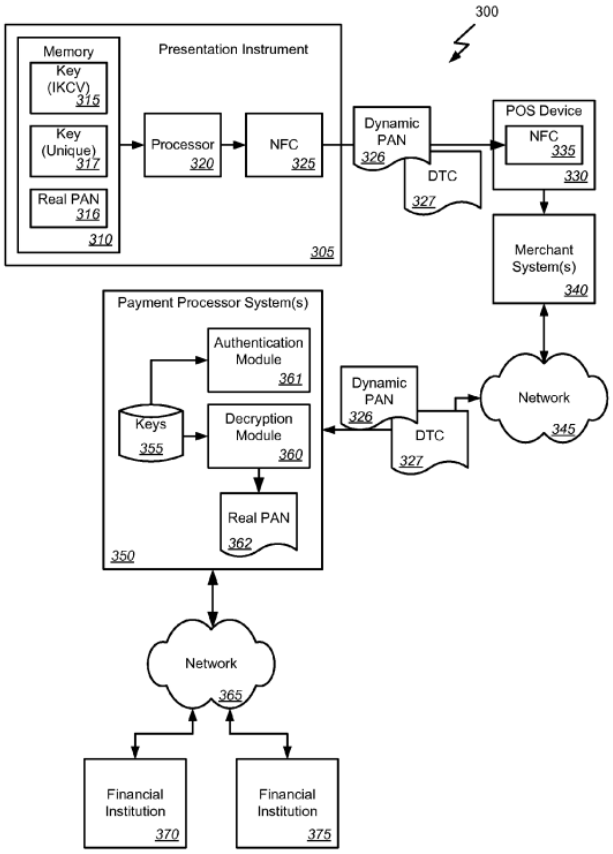

FIG. 3

Ex. 1004, Fig. 3. Figure 3 of Royyuru shows payment processing system 350 communicating via network 365 with financial institutions 370, 375 and via network 345 with merchant system 340. *Id.* ¶¶ 13, 44. Merchant system 340 receives information from point-of-sale (POS) device 330 that receives data from presentation instrument 305, e.g., a credit card via near field communications devices 325, 335. *Id.* ¶ 44.

Presentation instrument 305 includes processor 320 and memory 310. Memory 310 stores real primary account number (PAN) 316, card key 317, which is unique to the presentation instrument, and institution key card variant (IKCV) 315. *Id.* ¶ 46. IKCV 315 is a variant of an institution key derived from the institution key of the issuer of the account. *Id.* ¶¶ 33, 51, 91, Fig. 7. Real PAN 316, card key 317, and ICKV 315 are stored at the time the presentation instrument is issued by financial institution 370, 375 or by processing system 350. *Id.* ¶ 46.

During a transaction, the presentation instrument is passed over POS device 330. Ex. 1004 ¶ 47. Processor 320 in presentation instrument 305 generates dynamic PAN 326 by encrypting the real PAN with the IKCV. *Id.* Processor 320 also generates a dynamic transaction cryptogram (DTC) 327, using, e.g., a user's personal identification number (PIN). *Id.* The dynamic PAN and DTC are transmitted to merchant system 340 via POS device 330. Merchant system 340 transmits the dynamic PAN and DTC to payment processor system 350 via network 345. *Id.* Payment processor system 350 has stored therein keys 355 that correspond to card level keys 317 to facilitate authentication of the presentation instrument and of the user, based on the received DTC, using authentication module 361. *Id.* ¶¶ 47–48. Decryption module 360 then determines the real PAN and communicates the

transaction information via network 365 to financial institutions 370, 375. *Id.* ¶ 48.

The use of a dynamic PAN and DTC improves security by avoiding the transmission of primary account information that can be intercepted.

2. *Phillips (Ex. 1005)*

Phillips describes a user interface that enables a mobile telephone user to choose a payment card account and designate conditions and/or criteria to associate with the particular payment card account. Ex. 1005 ¶ 5. The conditions/criteria define when the payment card account is to be automatically selected when using the mobile phone in a purchase transaction. *Id.* Alternatively, when the user selects a displayed icon, e.g., a wallet icon, a sub-menu that presents the user several card account choices, including an automatic card selection option, appears on the display. *Id.* ¶ 6. Phillips describes a mobile phone/contactless payment device 100 including an integrated circuit or chipset 224 or "payment circuit" that stores card account numbers issued to the owner of the phone/contactless payment device. *Id.* ¶ 23, Fig. 2. Payment circuit 224 may be configured to interact with an RFID proximity reader of NFC proximity reader associated with a point-of-sale (POS) terminal to provide card account information for a transaction at the POS. *Id.*

3. *Casey (Ex. 1006)*

Casey describes confirming payment transactions using displays, e.g., by selecting on a touch screen a digital representation of a credit card in an electronic wallet or online payment system. Ex. 1006, 1:59–64. After moving of a graphical element, e.g., moving a selected credit card graphical element to a confirmation position, the electronic device may transmit a confirmation message to initiate payment with the selected payment

instrument. *Id.* at 1:64–66; 3:10–14, 3:20–26. After confirmation, the electronic device may transmit relevant transaction and account information. *See id.* at 3:26–37.

4. *Reason to Combine*

As discussed below, we find that Petitioner has not shown sufficiently that the combination of Royyuru, Phillips, and Casey would have taught or suggested claim limitations 1.h and 1.i. We discuss Petitioner's assertions regarding reason to combine and claim limitations 1[pre]–1.g to provide context for our discussion of limitations 1.h and 1.i.

Petitioner contends a person of ordinary skill would have had reason to apply Phillips and Casey to Royyuru to improve user interface and authentication features that complement Royyuru's secure cryptogram generation. Pet. 9–10. First, noting Royyuru's NFC user-merchant device communications can include payment requests from a POS terminal and that Casey discloses the additional benefit of displaying relevant information (merchant identity, product being purchased, price, tax, etc.) on the user device, Petitioner contends a person of ordinary skill would have known combining these features would allow the user to approve payment to the correct merchant and reduce the possibility of fraud. Pet. 10–12. Second, Petitioner contends that a person of ordinary skill would have recognized that modifying Royyuru based on well-known confirmation and authentication techniques taught by Phillips and Casey add an additional layer of security. *Id.* at 12–13. Third, Petitioner contends a person of ordinary skill would have recognized that modifying Royyuru to include a graphic interface to facilitate user selection of a payment method would allow a user to more readily select the desired card correctly. *Id.* at 13–15. Fourth, Petitioner contends that a person of ordinary skill would have

understood that modifying Royyuru to receive and display transaction information such as receipt, would have allowed the user to more easily maintain transaction records. *Id.* at 15. Fifth, Petitioner contends that modifying Royyuru based on Phillips and Casey would have involved the application of known techniques to a known system ready for improvement to achieve predictable results. *Id.* at 15–16. Petitioner supports its arguments with testimony from Dr. Shamos. *See* Ex. 1003, Shamos Decl. ¶¶ 111–114.

5. *Claim 1*

a) *Limitations 1.pre, 1.a, 1.b*

The preamble and claim limitations 1.a, and 1.b recite a method of performing a payment transaction in which a user provides an input to a priming operation and is recognized based on the user's input from a human input sensor, such as a touch screen. Ex. 1001, 19:35–45. Petitioner cites Royyuru as disclosing processing a transaction initiated from a mobile device by tapping a user device near a POS terminal. *See* Pet. 16–17 (citing, e.g., Ex. 1004 ¶¶ 2, 4, 5, 21, 35, 38–40, 44, 50, 53, 66; Ex. 1003, Shamos Decl. ¶¶ 116–118). Noting that Royyuru incorporates by reference a patent publication that describes a mobile device with a touch screen, Petitioner cites Phillips as disclosing the user entering a PIN that identifies the user as an authorized user. *Id.* (citing Ex. 1005 ¶¶ 18, 20, 35; Ex. 1006, 3:10–19, 9:37–52; Ex. 1003, Shamos Decl. ¶¶ 62–65, 119–120).

b) *Limitation 1.c*

Claim limitation 1.c recites receiving a request for a transaction payment at the electronic device via an NFC interface. Ex. 1001, 19:46–48. Petitioner cites Royyuru's disclosure of an NFC module for close proximity short range communications between a mobile device and a POS device and

Phillips as disclosing that the resulting device receives a payment request through NFC interrogation signals. Pet. 17 (citing Ex. 1004 ¶¶ 2, 22, 44, 46, 47, 51; Ex. 1005, ¶¶ 9, 23, 27, 57, 72; Ex. 1006, 8:52–9:8, Figs. 5, 8; Ex. 1003, Shamos Decl. ¶¶ 57–61, 121).

c) *Claim limitation 1.d*

Claim limitation 1.d recites displaying a transaction request and portion of an "an original static issuer-supplied payment account information associated with the payment method" for selection when paying the request. Ex. 1001, 19:49–53.

Petitioner cites Casey as disclosing the device resulting from the combined teachings of Royyuru and Phillips displays request information, e.g., sales order details (such as the price), and a prompt for the user to confirm the transaction, and that such information is received through the NFC device as a request for payment. *Id.* at 17 (citing Ex. 1006, 13:24–51, 8:52–9:8; Ex. 1003, Shamos Dec. ¶¶ 122–124). Petitioner cites Phillips as teaching the display of a Payment Cards sub-menu that allows the user to select the card to use for the current transaction. *Id.* at 18–19 (citing Ex. 1005 ¶¶ 37–41, Fig. 8; Ex. 1003, Shamos Decl. ¶¶ 123–124). Petitioner argues the displayed payment card information includes at least a portion of an "original static issuer-supplied payment account information" (e.g., credit card number). S*ee* Pet. 17–19 (citing Ex. 1006 13:24-51; 8:52-9:8, Figs. 5–8; Ex. 1005 ¶¶ 39-41, 57, Fig. 8, Shamos Decl. ¶¶ 122-124) *See also* Pet. 20 (citing Ex. 1004 ¶ 32, Shamos Decl. ¶¶ 123-124)).

d) *Claim limitation 1.e*

Claim limitation 1.e recites "retrieving from a memory attached to a processor of the device, device-specific static limited-use payment

information" associated with the selected payment method. Ex. 1001, 19:54–57.

Petitioner maps the claimed device-specific static limited-use payment information to Royyuru's IKCV stored on the device. Pet. 20 (citing Ex. 1004 ¶¶ 5–7, 46, 51; Ex. 1003, Shamos Decl. ¶¶ 66–71, 125). The "device" in this context is Royyuru's "presentation instrument," e.g., a smart card, mobile device, or any other device that can perform such functions. Ex. 1004 ¶¶ 46–47 (disclosing that memory 310 on presentation instrument 305 stores IKCV 315, unique card level key 317, and PAN 316 that can be read by passing or tapping the presentation instrument near the POS device). Petitioner cites Royyuru as teaching the IKCV is generated when each card (device) is being customized and is based on the PAN and the institution key (IK) of the issuer of the account. Pet. 20 (citing Ex. 1004 ¶¶ 5–10, 55–57, 46, 33; Ex. 1003 Shamos Decl. ¶ 125.).

Royyuru describes a "card level key" as "using a common institution level key and some card level attributes such as the Primary Account Number (PAN)" and notes that "[i]f the institution's key is compromised, all transactions for all cards or devices with this institution's key are potentially exposed," requiring creation of a new key and re-issuance of a large number of cards. Ex. 1004 ¶ 4. Royyuru discloses a DTC generated at the device using a unique card level key and also discloses a dynamic PAN that varies with each use of the device and is based on the real PAN and the IKCV. *Id.* ¶ 5. The IKCV is one of the card level keys of the device. *Id.* ¶ 6.

Arguing that the IKCV would be reused for multiple users on the same account and could be copied onto other devices, Patent Owner contends that the IKCV is inconsistent with the claimed "device-specific static limited-use payment information." *See* Prelim. Resp. 2–3; Prelim.

Resp. 10 (citing Ex. 1004 ¶¶ 5, 46). We need not decide this issue for purposes of this Decision, as we find that Petitioner has not demonstrated that claim limitations 1.h and 1.i are disclosed or suggested by the prior art. *See* Section IX.B.5.g *infra.*

e) *Claim limitation 1.f*

Claim limitation 1.f recites "dynamically generating, by a processor of the device, device-specific limited-use payment information for said selected payment method." Ex. 1001, 19:58–60.

Petitioner cites two examples of dynamically generated device-specific limited-use information in Royyuru: first, the "Dynamic Transaction Cryptogram (DTC)" and second, the "dynamic PAN." Pet. 21 (citing Ex. 1004 ¶¶ 5–10, 32–33, 47; Ex. 1003, Shamos Decl. ¶¶ 126–127, 55–56. Petitioner notes that Royyuru generates the DTC using a unique card level key stored on the device. *Id.* (citing Ex. 1004 ¶ 5). Petitioner cites the IKCV as a card level key, noting that paragraph 6 of Royyuru discloses decrypting the PAN at the transaction device using one of the card level keys, e.g. the IKCV. *Id.* (citing Ex. 1004 ¶ 6). Petitioner also notes that Royyuru discloses generating the DTC using unique Card Key (CK) 317. *See* Pet. 21 (citing Ex. 1004 ¶ 57 (disclosing card key CK is "unique per card")); Ex. 1003, Shamos Decl. ¶ 126).

Petitioner also cites the dynamic PAN as including an "unpredictable number" encrypted using the IKCV. *See* Pet. 21–22 (citing Ex. 1004 ¶¶ 5, 57). Both the DTC and PAN are "valid for a single transaction" according to the Petitioner. Pet. 22 (citing Ex. 1004 ¶¶ 5, 57, 33).

f) *Claim limitation 1.g*

Claim limitation 1.g recites using the "limited-use payment information" in place of at least a portion of the "selected original issuer-supplied payment information[.]" Ex. 1001, 19:61–63.

Petitioner cites Royyuru as teaching use of the DTC and dynamic PAN in place of the real PAN (Primary Account Number) *see* Pet. 22 (citing Ex. 1004 ¶¶ 57, 7) where both the DTC and dynamic PAN are generated using the IKCV and/or CK. *See* Pet. 21. "'A Dynamic Transaction Cryptogram (DTC) can be generated at the device, using a unique card level key stored on the device.'" Pet. 59–60 (citing Ex. 1004 ¶ 5).

The Petition cites Royyuru as disclosing that the dynamic PAN or Pseudo-PAN can be sent and used in place of the real PAN in the transaction. Pet. 22 (citing Ex. 1004 ¶¶ 7, 32, 57; Ex. 1003, Shamos Decl. ¶¶ 128–129). Petitioner further notes that in other examples, Royyuru discloses providing the DTC and the dynamic PAN to the point-of-sale device. *Id.* (citing Ex. 1004 ¶¶ 6–10, 34). Referencing its discussion of claim limitation 1.f, arguing the DTC and the dynamic PAN constitute examples of the claimed "device-specific limited-use payment information," Petitioner notes that the DTC and dynamic PAN are generated using the IKCV and/or the CK that is unique to the card. *Id.*

g) *Claim limitations 1.h and 1.i.*

Claim limitation 1.h recites "combining of said dynamically-generated limited-use payment information with said static limited-use payment information, to generate a complete device payment information;" Ex. 1001, 19:64–67. Claim limitation 1.i recites "transmitting said complete device payment information from said electronic device to a recipient reader via

said NFC interface to the recipient NFC reader for a processing of the payment transaction." *Id.* at 20:17–20.

Petitioner relies on Royyuru alone as teaching claim limitations 1.h and 1.i. Pet. 22–24. Petitioner asserts that "[a]s described in connection with step [1.f], the IKCV (static limited-use payment information) makes up part of the DTC." Pet. 22 (citing Ex. 1004 ¶¶ 5–9, 57). Petitioner contends that "the DTC and dynamic PAN (dynamic payment information) are provided together, along with additional information . . ., which a POSITA would have recognized as combining the DTC and dynamic PAN (and additional information) to generate a complete device payment information." Pet. 22–23 (citing Ex. 1004 ¶¶ 6–10, 34, 50, 57; Ex. 1003, Shamos Decl. ¶¶ 130, 131).

The Petition's discussion of limitation 1.f asserts that "[t]he DTC 'can be ***generated at the device***, using a unique card level key stored on the device'" and identifies the IKCV as "an example of a 'card-level key [] of the device.'" Pet. 21 (citing Ex. 1004 ¶ 5, 6). Petitioner cites Royyuru as disclosing the "DTC can be computed by the device by combining several fields including the PAN, service code, expiration date, unpredictable number, and ATC and encrypting them using the CK." *Id.* (citing Royyuru ¶ 57).

Addressing claim limitation 1.h., Petitioner presents two alternative contentions. Petitioner's first alternative relies on Royyuru's dynamic PAN as corresponding to the dynamic payment information recited in claim limitation 1.h. For this first alternative, Petitioner argues, "because the IKCV makes up part of the DTC, a POSITA would have recognized that the IKCV is combined with the dynamic PAN as part of forming Royyuru's

complete device payment information." Pet. 23 (citing Ex. 1004 ¶¶ 57, 5–9; Ex. 1003, Shamos Decl. ¶ 130).

Petitioner's second alternative relies on Royyuru's DTC as corresponding to the dynamic payment information recited in claim limitation 1.h. For this second alternative, Petitioner argues that "because the IKCV makes up part of the dynamic PAN, a POSITA would have recognized that the IKCV is combined with the DTC as part of forming Royyuru's complete device payment information." Pet. 23 (citing Ex. 1003, Shamos Decl. ¶ 131; *see also* Ex. 1003, Shamos Decl. ¶ 131 ("the dynamic PAN is also generated using the IKCV to encrypt other information, therefore teaching that the IKCV is part of the dynamic PAN")).

Addressing claim limitation 1.i, Petitioner contends that Royyuru describes providing the DTC and the dynamic PAN to a POS device via a NFC module of the presentation instrument and a corresponding module of the POS device. Pet. 23 (citing Ex. 1003, Shamos Decl. ¶ 132; Ex. 1004 ¶¶ 2, 22, 44, 47, 51).

Patent Owner agrees with Petitioner that Royyuru transmits two dynamic numbers, the dynamic PAN and the DTC. Prelim. Resp. 25. Patent Owner first asserts that Petitioner's argument fails because the IKCV is not device-specific. Prelim. Resp. 25–26 (citing Ex. 1004, Fig. 3). As noted above, we need not resolve that issue for purpose of this Decision. *See* Section 1.d, *supra*.

Responding to Petitioner's second alternative in which Royyuru's DTC corresponds to the claimed "dynamically-generated limited-use payment information," Patent Owner argues that, even if the IKCV is both device-specific and associated with a particular account, it is not used in the claimed "complete device payment information" and is not transmitted to a

recipient reader. Prelim. Resp. 26. Patent Owner asserts that Royyuru's DTC does not include the IKCV, rather the "DTC includes a separate 'unique' card key, that Petitioner has not argued (and cannot argue) is the device-specific limited-use payment information required by the claim." Prelim. Resp. 31.

Responding to Petitioner's first alternative in which Royyuru's dynamic PAN corresponds to the claimed "dynamically-generated limited-use payment information," Patent Owner acknowledges that Royyuru's dynamic PAN can be generated based on the real PAN and the IKCV, but argues that "based on" is not the same as using the IKCV itself and combining it with a dynamic number. Prelim. Resp. 28. According to Patent Owner, "[t]he IKCV ***itself*** is not actually combined with any dynamically-generated limited-use payment information. Rather, the *dynamic* PAN is combined with the DTC (also a dynamic number) to form the complete payment information." *Id.* Patent Owner acknowledges that "[t]he IKCV may be an input to generation of the dynamic PAN" but contends "that is all it is . . . the dynamic PAN may be 'based on' the IKCV, but the IKCV itself is not part of the complete payment information and is not transmitted to the recipient NFC reader." *Id.*

We agree with Patent Owner that Petitioner has not demonstrated that Royyuru teaches or suggests the claimed steps of "combining of said dynamically-generated limited-use payment information with said static limited-use payment information, to generate a complete payment information" and "transmitting said complete device payment information from said electronic device to a recipient reader . . ." as recited in claim limitations 1.h and 1.i. Petitioner maps the static limited use payment information to Royyuru's IKCV and the dynamically-generated limited-use

payment information to either Royyuru's DTC or dynamic PAN. Pet. 22–23. Petitioner has not shown sufficiently that either of its alternative contentions satisfies claim limitations 1.h and 1.i.

Regarding Petitioner's second alternative in which Royyuru's DTC corresponds to the dynamically-generated payment information, Petitioner's contention is not sufficiently supported by the evidence. Royyuru states that the DTC is generated by encrypting information with a card key (CK), which is unique per card. Ex. 1004 ¶ 57. But contrary to Petitioner's contentions, Royyuru does not disclose using the IKCV to generate the DTC.

Regarding Petitioner's first alternative in which Royyuru's dynamic PAN corresponds to the dynamically-generated payment information, Petitioner does not show that Royyuru discloses or suggests combining the dynamic PAN with the static limited use payment information (IKCV) to generate the claimed complete device payment information. Instead, Royyuru discloses the dynamic PAN is created through encryption using the IKCV. Ex. 1004 ¶¶ 5, 57. Petitioner fails to show that using a secret key, such as Royyuru's IKCV, to encrypt payment information would have suggested to a POSITA combining dynamically-generated payment information with static payment information to generate complete payment information, as recited in claim limitation 1.h. Nor does Petitioner show sufficiently that Royyuru's IKCV is part of a complete payment information that is transmitted to an NFC reader, as required to satisfy claim limitation 1.i.

As Petitioner has not demonstrated sufficiently that Royyuru discloses combining the dynamically generated limited-use payment information (either the DTC or the dynamic PAN) with the static limited-use payment

information (the IKCV) to form the claimed complete device payment information and transmitting the combined payment information to an NFC reader, we find that Petitioner has not demonstrated sufficiently that Royyuru teaches or suggests claim limitations 1.h and 1.i. In view of this finding, we need not analyze the remaining limitations of claim 1 for purposes of this Decision.

h) *Conclusion as to Claim 1*

Having considered the arguments and evidence of record, we find that Petitioner has not demonstrated the combined teachings of Royyuru, Phillips, and Casey and would have disclosed or suggested the limitations of claim 1 to an ordinarily skilled artisan.

6. *Claims 2–18*

Claims 2–18 depend from claim 1. As we find that Petitioner has not demonstrated the combined teachings of the references disclose all the limitations of claim 1, Petitioner has not demonstrated the combined teachings of Royyuru, Phillips, and Casey would have disclosed or suggested the limitations of claims 2–18 to an ordinarily skilled artisan.

C. Claims 5, 6, 8–11, 13–17 as obvious over Royyuru, Phillips, Casey, and Rans

1. *Rans (Ex. 1014)*

Rans describes a method of authenticating a contactless card payment transaction. Ex. 1014 ¶¶ 20–21. The card sends a first authentication that that is eventually received by the card issuer, where another version of the authentication data is generated. When the first and second authentication data match, or is sufficiently similar to the authentication data submitted by the user or mobile device, the user is authenticated as having authority to authorize the transaction. *Id.* ¶ 22. The device uses one or more of a variety

of variables to generate the dynamic value including numbers generated inside or outside the device while the authentication entity maintains its own set of data (e.g. a PIN, challenge, unpredictable number, synchronized transaction counter, or "any other data") to generate its own authentication data used in the verification. *Id.* ¶ 23.

2. *Claims 5, 6, 8–11, and 13–17*

Claims 5, 6, 8–11, and 13–17 depend from claim 1. In asserting this ground, Petitioner cites Royyuru as teaching the limitations of claim 1 discussed above. Pet. 42–48. Petitioner does identify any disclosure in Rans that cures the infirmities of Royyuru discussed above. *See* Section IX.B.5.g. *supra.* We find that Petitioner has not demonstrated that the combined teaching of Phillips, Royyuru, Casey, and Rans would have disclosed or suggest the limitations of claim 5, 6, 8–11, and 13–17 to a person of ordinary skill.

D. Claims 19–21, 23–25, and 28–30 as obvious over Philips, Royyuru, and Casey

1. *Claim 19*

Claim 19 recites a method of performing an online payment transaction. In a manner similar to claim limitation 1.h, claim limitation 19.f recites "combining said at least one limited-use numbers, with said selected account information, to form a complete payment information." Ex. 1001, 23:11–18. In a manner similar to claim limitation 1.i, claim limitation 19.i recites "transmitting by the wireless interface of the approved complete payment information for the online transaction." *Id.* at 23:32–34.

Referencing its arguments concerning claim limitations 1.f–1.h, Petitioner submits that the Phillips-Royyuru-Casey combination provides Elements 19.e–19.f. Pet. 57 (citing Pet. 21–23; Ex. 1003, Shamos Decl.¶

242). The Petition provides no further explanation or reasoning about how its discussion of claim limitation 1.f–1.h applies to claim limitations 19.e–19.f. For the "transmitting . . . complete payment information" step of claim limitation 19.i, Petitioner contends that, in the Phillips-Royyuru-Casey combination, payment information is transmitted to the merchant, where the "payment information comprises the DTC and dynamic PAN described by Royyuru." Pet. 59.

As discussed in Section IX.B.5.g *supra* we are not persuaded that Petitioner has demonstrated the combined teachings of Phillips, Royyuru, and Casey would have disclosed or suggested claim limitations 1.h and 1.i, which are similar to limitations 19.f and 19.i. In the absence of further explanation as to claim limitations 19.f and 19.i, we find that Petitioner has not demonstrated that the combination of Phillips, Royyuru, and Casey teaches or suggests claim limitations 19.f. and 19.i and we need not analyze the remaining limitations of claim 19.

2. *Claims 20, 21, 23, and 24*

Claims 20, 21, 23, and 24 depend from claim 19. As we find that Petitioner has not demonstrated the combined teachings of the references disclose all the limitations of claim 19, Petitioner has not demonstrated the combined teachings of Royyuru, Phillips, and Casey and would have disclosed or suggested the limitations of claims 20, 21, 23, and 24 to a skilled artisan.

3. *Claim 25*

Independent claim 25 recites a non-transitory, computer-readable medium storing computer-executable instructions to cause the processor to carry out enumerated instructions. Ex. 1001, 24:49–25:16. In a manner similar to claim limitations 1.h and 1.i, claim limitation 25.g recites

"form[ing] a complete combined device payment information from a dynamically generated portion and a statically generated portions stored in a memory of the device" and 25.h recites "transmit[ing] said complete device payment information from said electronic device to the recipient of the online purchase transaction." Ex. 1001, 25:4–10. Petitioner's analysis of claim limitations 25.g and 25.h cites its discussions of claim limitations 1.e–1.i. Pet. 68–69. Petitioner's discussion of these limitations also cites Casey as disclosing the claimed display of graphical elements for confirming the payment transaction. *Id.* As we find that Petitioner has not demonstrated the combined teachings of the references disclose all the limitations of claim 1, in particular claim limitations 1.h and 1.i, (*see* Section IX.B.5.g *supra*) Petitioner has not demonstrated the combined teachings of Royyuru, Phillips, and Casey and would have disclosed or suggested the limitations of claim 25 to a skilled artisan.

4. *Claims 28–30*

Claims 28–30 depend from claim 25. Petitioner does identify any disclosure that cures infirmities of Royyuru discussed above with respect to claim 25. *See* Section IX.B.5.g. *supra.* We find that Petitioner has not demonstrated that the combined teaching of Phillips, Royyuru, and Casey, would have disclosed or suggest the limitations of claim 28–30 to a person of ordinary skill.

E. Claims 23 and 28–30 as obvious over Philips, Royyuru, Casey, Rans

Claim 23 depends from claim 19. Claims 28–30 depend from claim 25. Petitioner does identify any disclosure in Rans that cures the infirmities of Royyuru discussed above with respect to claim 19 and 25. *See* Section IX.B.5.g. *supra.* We find that Petitioner has not demonstrated that

the combined teaching of Phillips, Royyuru, Casey, and Rans would have disclosed or suggest the limitations of claims 23 and 28–30.

F. Claim 27 as obvious over Philips, Royyuru, Casey, Rans, Carlson

1. *Carlson (Ex. 1013)*

Carlson describes a mobile device for conducting transactions using pseudo primary account identifiers from portable wireless devices. Ex. 1013 ¶ 12. The pseudo primary account identifier resembles the format of a real primary account identifier (e.g. a credit card number) without revealing the real account identifier. *Id.* ¶ 30. The pseudo account identifier is generated by the payment processor, specific to the device, and provided to the mobile device for use in place of the primary account identifier. *Id.* ¶ 35.

2. *Claim 27*

Claim 27 depends from claim 25. Petitioner does not identify any disclosure in Carlson that cures the infirmities of Royyuru discussed above with respect to claim 25. *See* Sections IX.B.5.g, IX.D.3 *supra.* We find that Petitioner has not demonstrated that the combined teaching of Phillips, Royyuru, Casey, and Carlson would have disclosed or suggest the limitations of claim 27 to a person of ordinary skill.

G. Claim 26 as obvious over Philips, Royyuru, Casey, and Law

1. *Law (Ex. 1015)*

Law describes methods of authentication for a financial transaction using biometric data (e.g. voice data, finger prints, eye scan) or personalized security questions (e.g. favorite color). Ex. 1015 ¶¶ 53, 67. When incorrect information is provided by the user, the device can limit retries to reduce the probability of success of a brute force attack. *Id.* ¶ 139.

2. *Claim 26*

As claim 26 depends from claim 25. Petitioner does not identify any disclosure in Carlson that cures the infirmities of Royyuru discussed above with respect to claim 25. *See* Section IX.B.5.g, IX.D.3 *supra.* We find that Petitioner has not demonstrated that the combined teaching of Phillips, Royyuru, Casey, and Law would have disclosed or suggest the limitations of claim 26 to a person of ordinary skill.

X. CONCLUSION

For the reasons discussed above, we not persuaded that Petitioner has demonstrated a reasonable likelihood that it will succeed on any of the challenges to patentability advanced in the in the Petition.

XI. ORDER

In consideration of the foregoing, we decline to institute *inter partes* review.

FOR PETITIONER:

W. Karl Renner
Jeremy J. Monaldo
Patrick J. Bisenius
Nicholas Stephens
Kiersten Batzli
FISH & RICHARDSON P.C.
axf-ptab@fr.com
jjm@fr.com
bisenius@fr.com
nstephens@fr.com
batzli@fr.com
IPR39843-0146IP1@fr.com
PTABInbound@fr.com

FOR PATENT OWNER:

Matt Berkowitz
Patrick Colsher
Yue (joy) Wang
REICHMAN JORGENSEN LEHNAN &
FELDBERG LLP
mberkowitz@reichmanjorgensen.com
pcolsher@reichmanjorgensen.com
ywang@reichmanjorgensen.com