

UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE PATENT TRIAL AND APPEAL BOARD

SAMSUNG ELECTRONICS CO., LTD.

Petitioner

v.

CARDWARE INC.

Patent Owner.

Inter Partes Review No. IPR2023-00219
U.S. Patent No. 11,176,538

CARDWARE INC.'S PATENT OWNER PRELIMINARY RESPONSE

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LIST OF EXHIBITS

No.	Exhibit Description
2001	Docket Control Order for <i>CardWare Inc. v. Samsung Electronics Co., Ltd.</i> , Case No. 22-cv-00141-JRG (E.D. Tex.)
2002	Median Time-to-Trial for Patent Cases before Judge Gilstrap for cases filed on or after January 1, 2019 (Source: DocketNavigator; as of March 10, 2023)
2003	Order Denying Motion to Stay in <i>CardWare Inc. v. Samsung Electronics Co., Ltd.</i> , Case No. 22-cv-00141-JRG (E.D. Tex.)

I. Introduction

On November 28, 2022, Samsung Electronics Co., Ltd. (“Samsung” or “Petitioner”) filed a Petition requesting *inter partes* review of claims 1-21 and 23-30 (“Challenged Claims”) of U.S. Patent No. 11,176,538 (“the ’538 patent”) (Ex. 1001), entirely on obviousness grounds. Paper 1 (“Petition” or “Pet.”). On December 15, 2022, the Board issued a Notice of Filing Date Accorded for the petition and set the time for filing patent owner’s preliminary response. Paper 5.

The Board should deny institution because Petitioner fails to meet its burden of demonstrating that its prior art references render obvious any of the of the Challenged Claims, which generally relate to methods and systems for reducing the risk of fraud in connection with completing payment transactions. Petitioner’s arguments regarding Grounds 1A and 1B, which challenge claims 1-18 of the ’538 patent, are representative of the Petition’s three main flaws.

First, Petitioner’s references simply fail to disclose *any* “device-specific static limited-use payment information.” Petitioner points exclusively to an Institution Key Card Variant (“IKCV”) in the primary Royyuru reference, but, Royyuru itself discloses that the IKCV is account-specific, not device-specific. For example, multiple family members or employees of the same company (a corporate card) might share the same credit card account and have the same IKCV. Different devices

can therefore use the same IKCV. None of the other references fill the gap, nor does Petitioner so contend.

Second, as Petitioner acknowledges, claims 1-18 require that the “device-specific static limited-use payment information” is associated with a “selected payment method.” As Petitioner acknowledges, this requires that the device-specific static number is also tied to an account, wherein a user *selects* a particular account (from multiple options) with an associated device-specific static number. Petitioner does not explain how the proposed combination of Royyuru and Phillips could possibly meet this limitation or how one of ordinary skill would accomplish it. Royyuru itself only discloses a single device linked to a single payment account. It uses the IKCV as one input into generation of certain dynamic numbers used for payment transactions. To fill the gap, Petitioner relies on Phillips, which discloses a multi-account and multi-issuer system wherein a user can select from multiple card accounts that are loaded onto a separate electronic device, such as a mobile phone. The credit cards come from financial institutions while the device comes from, per Phillips, a company like Apple.

Petitioner never explains how the IKCV would work in this re-imagined configuration. As noted above, Royyuru’s IKCV is account-specific, and comes from the financial institution or payment processor. But, to the extent Petitioner contends it is “device-specific” as the claims require, Petitioner does not explain

how the re-imagined multi-account and multi-issuer device using the account-selection teaching of Phillips would have or store an IKCV tied to each account, and the particular device. If the device maker such as Apple generates the IKCV such that it is capable of being particular to the device, does the device have available a different IKCV for each of the multiple card accounts that are available on the selectable-payment display of Phillips (such that each IKCV is both device and account specific)? And, alternatively, if the IKCV comes from the financial institution and is particular to each of the card accounts that can be uploaded to and selectable from the Phillips multi-account approach, how are they device specific? What if a user loads the same account into multiple devices, such as both a mobile phone and a smart watch? Petitioner never so much as addresses these key questions. Nor do the references. Instead, Petitioner just hand-waves through the combination with generic and boilerplate recitations of obviousness concepts.

Third, and perhaps the most obvious flaw with Ground 1, is that the references do not meet the limitations “combining of [] dynamically-generated limited-use payment information with said static limited-use payment information, to generate a complete device payment information.” and “transmitting said complete device payment information . . . for a processing of the payment information.”

Even imagining that the IKCV is *both* device and account specific (which it is not), it is not transmitted as part of the completed payment information. Rather,

Royyuru discloses transmission of two dynamic numbers—a dynamic PAN and a dynamic cryptogram (DTC). Petitioner acknowledges that neither of these are “static” numbers. Instead, Petitioner contends that the IKCV is transmitted as part of the DTC. This is simply wrong and is a clear misreading of the reference. Royyuru is clear that the DTC includes an entirely separate (*i.e.*, not IKCV) card-level key (“CK”), which is different than the IKCV. Moreover, Petitioner and its experts offer almost nothing (and certainly don’t cite a reference) as to why a person or ordinary skill would have created a system with this critical limitation.

These same problems, and others, permeate several of Petitioner’s remaining grounds. The Board should therefore decline to institute.

II. The ’538 Patent Claims

When David Wyatt conceived of the invention claimed in the ’538 patent over a decade ago, there were “several different types of credit cards available in the marketplace.” Ex. 1001, 1:32-33.

As the patent explains:

A first type of credit card is a conventional, standard piece of plastic with a magnetic strip, which is readily available and in wide commercial use. The advantage of this first type of credit card is that a large portion of the infrastructure for credit card transactions is built around this type of card, and consequently such a card works in a wide array of vendors’ credit card machines, automated

teller machines (ATMs), and other devices that support the present credit card and banking infrastructure.

Ex. 1001, 1:33-41.

The claims of the '538 patent generally relate to systems and methods for reducing fraud during payment transactions. Claim 1 is illustrative and is directed to a method of performing a payment transaction via an NFC interface of an electronic device. Ex. 1001, 19:35-20:29 (claim 1). The method involves receiving a request for a transaction payment at an electronic device via an NFC interface. Ex. 1001, 19:46-48. The electronic device then displays the payment request as well as at least a portion of an original account number (such as a traditional credit card number) “for a user selection.” *Id.*, 19:49-53. The method then “retriev[es] from a memory [of the electronic device] a device-specific static limited-use payment information, associated with said selected payment method.” *Id.*, 19:54-57. In other words, as Petitioner recognizes, the user makes a “selection” from one of multiple payment methods, and then the claimed method retrieves a device-specific static limited-use number associated with that particular selected payment method. *See id.*; Pet. at 13-14.

The method further “dynamically generat[es]...device-specific limited-use payment information, for said selected method” and combines it with the static

limited-use payment information to generate complete device payment information” that is used to complete a payment transaction. *See* Ex. 1001, 19:64-20:29.

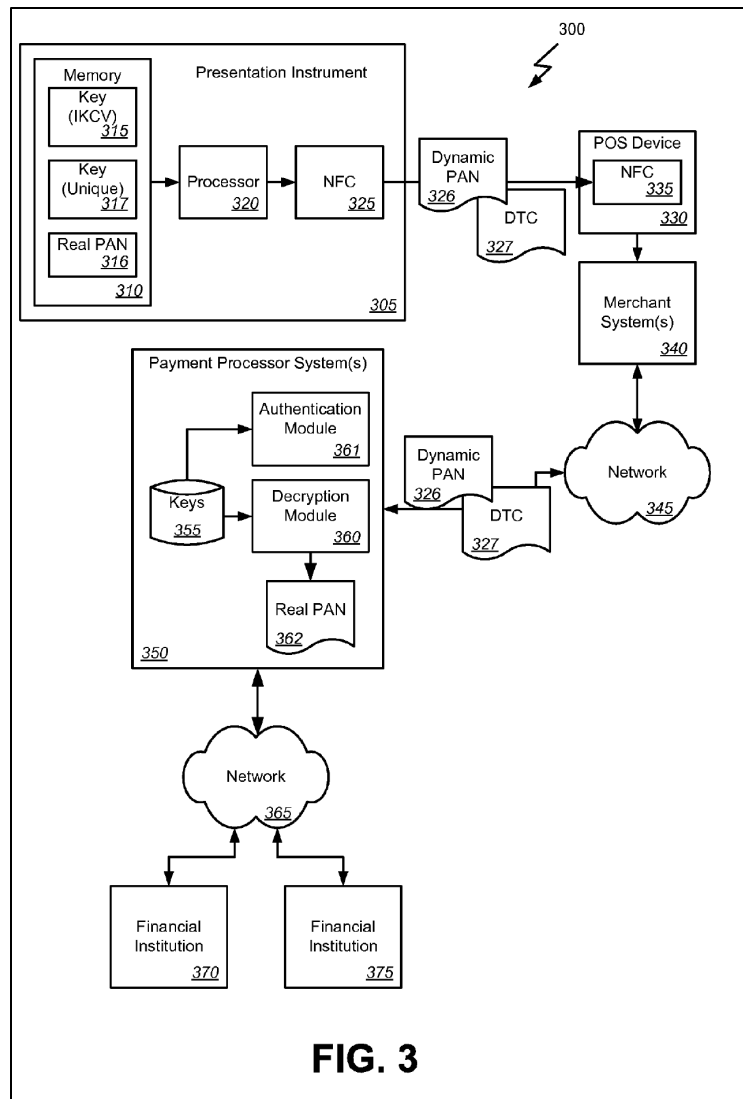
The various cryptographic techniques of the ’538 patent drastically improves security vis-à-vis prior art while maintaining convenience and flexibility by allowing selection and use of different payment accounts.

III. Samsung’s Alleged Prior Art

A. Royyuru

1. Royyuru’s Basic Operation

Royyuru discloses a payment system and methods “utilizing dynamic cryptograms.” Ex. 1004, Abstract, [0001], [0005], [0044]; [0053]; *see* Pet., 5. Specifically, the system uses two dynamically-generated numbers—a dynamic transaction cryptogram (“DTC”) and a dynamic PAN (“DPAN”)—in connection with payment transactions. Ex. 1004, [0004]; Pet., 5. Figure 3, shown below, is representative of how the system works.



Ex. 1004, Fig. 3, [0044].

The system includes a “presentation instrument 305” which can include a smart card or mobile device. Ex. 1001, [0044], [0046]. The presentation device includes a memory 310, a processor 320, and an NFC module 325. *Id.*, [0046]. The memory 310 includes three separate pieces of information that are relevant to Petitioner’s arguments. First, it includes a real “primary account number” or “Real PAN 316,” which is the number provided by a card issuer (*e.g.*, the 16 digit number

on the front of any typical credit card). *See id.*, [0046], [0058]. Second, it includes a unique card-level key 317. *See id.*, [0046]. Importantly, *this* unique card-level key (and not the IKCV, discussed below) is used in connection with generation of the DTC. *See id.*, [0007], [0009], [0047]. And third, the memory includes an Institutional Key Card Variant (“IKCV”). *Id.*, [0046]. The IKCV is critical to Petitioner’s arguments because Petitioner labels it as the “static device-specific limited-use payment information.” Pet., 20. The IKCV is an account and institution-specific (*i.e.*, card issuer-specific) number that is a “variant” of an institution key of a financial institution (*i.e.*, card issuer). The IKCV is generated “by the payment processor system 350, financial institution 370 or 375 or other issuer of the instrument at the time of issuance.” *Id.*, [0044]. The IKCV is *not* a device-specific number. *See infra* Sections III.A.2, VI.A.1.

“When the cardholder wishes to execute a transaction . . . he . . . passes or taps the presentation instrument 305 on or near the point-of-sale device 330.” Ex. 1004, [0047]. This triggers the processor of the presentation instrument 305 to generate a dynamic PAN based on the IKCV, the real PAN, and other information. *Id.* Royyuyu’s “dynamic PAN can be considered a dynamic, *i.e.*, good for one use, cryptogram that represents but hides the real PAN 316.” *Id.*

The processor can also “generate a dynamic transaction cryptogram (DTC) 327 based on the unique card-level key 317 and perhaps other information such as a Personal Identification Number (PIN) provided by the consumer.” Ex. 1004, [0047].

The dynamic PAN 326 and the DTC 327 can then be submitted to the payment processor system 350 and/or financial institution 370 and 375 via the payment network 345 for approval and/or processing of the transaction. Ex. 1004, [0047].

The dynamic PAN and DTC are both dynamic numbers. By design, neither is a static number.

2. The IKCV

Petitioner focuses heavily on Royyuru’s IKCV. Royyuru explains that a common method to prevent identity theft is to encrypt a cardholder’s account number. Ex. 1004, [0004]. Typical methods involve encrypting the account number using an encryption key that is “derived from an institution level key (i.e., it applies to many cards) and the card number.” *Id.* However, Royyuru explains that this can create risks because if an institution key “is compromised, all transactions for all cards or devices with this institution’s key are potentially exposed.” *Id.* Accordingly, a “new key must be created and a possibly large number of cards re-issued.” *Id.*

Royyuru proposes new methods for dealing with these security risks, including use of the DTC and the dynamic PAN, which can be based on a variant of

the issuer key—the IKCV. Ex. 1004, [0005]. “The IKCV can be derived from the institution key of the issuer of the account.” *Id.* There is no indication in Royyuru that the IKCV is a device-specific number. To the contrary, it comes from the issuer of the card, as a variant of a financial “institution key,” and therefore would be repeated for any users on the same account (in the same way that multiple users of a corporate card could have the same payment information when using a card with the same primary account number and expiration). *Id.*, [0005], [0046].

Royyuru states that the IKCV “can be generated for the presentation instrument 305 by the payment processor system 350, financial institution 370 or 375 or other issuer of the instrument at the time of issuance and based on but distinct from an institution key for the issuer.” Ex. 1004, [0046]. Royyuru explains that the IKCV is a “variant of the IK [the institution key] derived by combining the IK with digits from the PAN and IKVGEN.” *Id.*, [0057]. The IKVGEN simply refers to the “IK variant generator.” *Id.* Royyuru further explains that the “IKCV can be generated when each card (device) is being customized. Given a card number (PAN) and KEY-ID, [the] payment processor can compute the IKCV.” *Id.* The Key ID is simply a “designator which identifies an IK [the institution key] in the repository.” *Id.* It is “assigned sequentially by payment processor when a new IK is requested.” *Id.*

Accordingly, and in sum, the IKCV is generated using the primary account number (which is associated with a user's account and not device-specific) and a KEY-ID, which is a number assigned sequentially when a new IK is requested. Ex. 1004, [0057]. In other words, the KEY-ID is assigned by a payment processor, and not a device maker, and is based on an issuer key (specific to the issuer of the account) and a user's payment card account. *Id.* There is no indication anywhere in Royyuru that the IKCV is specific to a device. As further described below, this would be particularly true in connection with Petitioner's proposed combination, which re-imagines Royyuru as a mobile device with multiple selectable accounts from different issuers (based on Phillips and Casey). *See* Pet., 9-16, 49-51. Any mobile phone would be manufactured and sold by a mobile phone company, not a payment processor who issues card accounts, meaning that the IKCV would be coming from a different source than the device maker and would not be device-specific. Royyuru is silent on any correlation between an IKCV and a particular device; there is nothing to prevent replication of IKCV across multiple devices, nor a mechanism to prevent reassignment if a specific device was compromised.

B. Phillips

Unlike Royyuru, which focuses on an electronic card with limited display area and functionality, Phillips describes use of a mobile phone as a payment vehicle. Pet., 6-8, 17-20. More specifically, Phillips describes a mobile phone with a virtual

wallet where a user can select from one of multiple card accounts (or set up an automatic selection process). Pet., 6. Figure 8 is representative, as shown below. See Pet., 7 (reproducing Ex. 1005, Fig. 8).

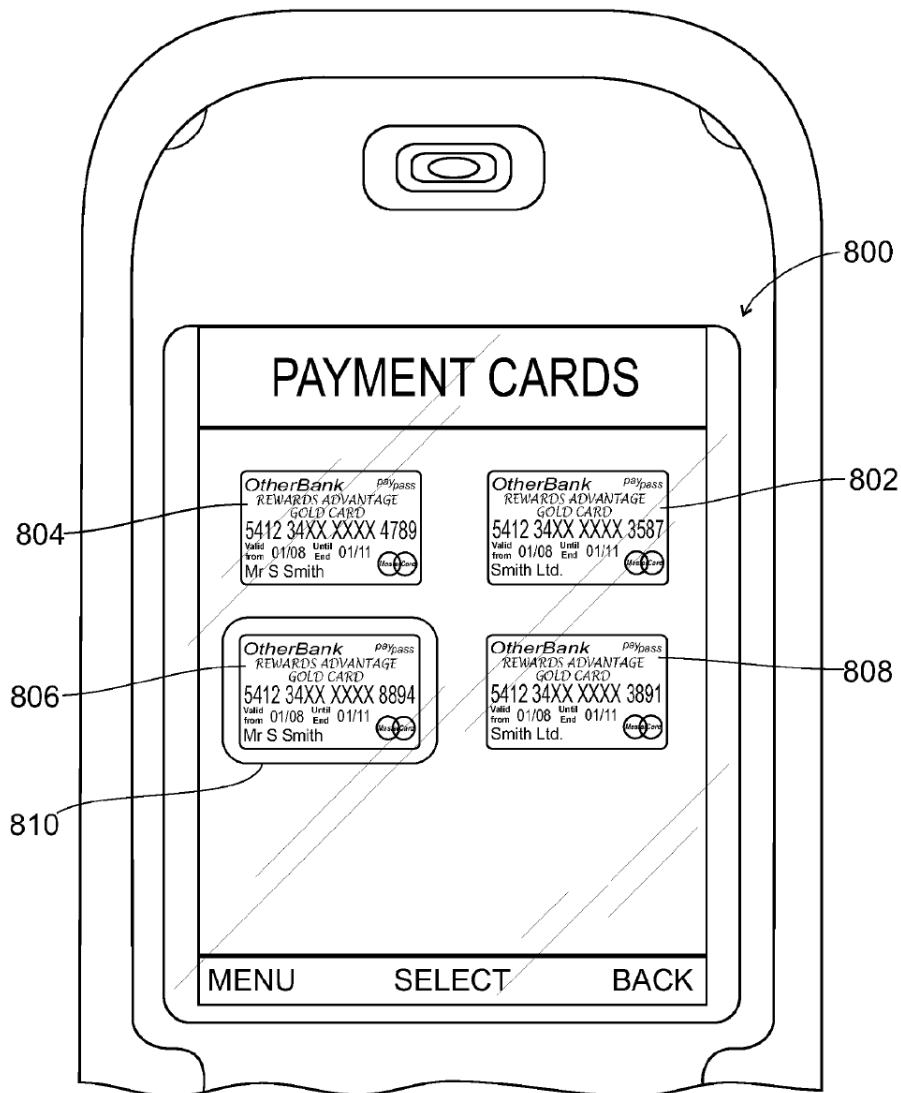


FIG. 8

Phillips contemplates PIN number security to validate a user's identity before allowing payment, but otherwise transmits the actual credit card information to a

merchant (plus, in some instances, a stored signature or photograph, or a dynamic cryptogram). *See* Ex. 1005, [0035], [0038]-[0039], [0048], [0052]-[0054], [0058]-[0059], [0062], [0065]-[0066], [0068], [0070], [0072]-[0073], claims 11 & 19. Phillips does not teach use of a static device-specific number in connection with payment. Nor does Petitioner argue as much. *See* Pet., 20-22, 32, 69-70, 81-83.

C. The Other References Do Not Disclose a Static-Device-Specific Number

Petitioner does not argue that any of the other references identified in its Grounds—Casey, Rans, Carlson, Law—teach use of a device-specific static number in connection with a payment method or “dynamically generating...device-specific limited-use payment information, for said selected payment method.” *See* Pet. 20-22, 32, 35, 57, 68-70, 81-83. Nor does Petitioner assert that any of these references supply a motivation to create or implement these limitations or any others that are the focus of this Preliminary Response. Accordingly, Patent Owner does not address them in this Preliminary Response.

IV. Claim Construction

For the purposes of this Preliminary Response only, Patent Owner believes that claim construction is not required to resolve any issues.

V. Level of Ordinary Skill in the Art

For the purposes of this Preliminary Response only, Patent Owner does not dispute Petitioner’s assertion that a person of ordinary skill in the art as of the Critical

Date (a “POSITA”) 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 technology, where graduate education could substitute for professional experience, or significant experience in the field could substitute for formal education.

VI. Argument

A. Petitioner Fails to Meet Its Burden As To Grounds 1A and 1B

Petitioner’s Ground 1A asserts that Challenged Claims 1-18 are obvious over a combination of Royyuru, Phillips, and Casey, and Ground 1B asserts that Challenged Claims 5-6, 8-11, and 13-17 are obvious over the same Royyuru-Phillips-Casey combination, plus Rans. These Grounds should be rejected at least because (i) none of the references discloses or teaches a “device-specific static limited-use payment information”; (ii) Petitioner fails to explain how the combination of Royyuru and Phillips discloses a “device-specific static” number that is “associated with said selected payment account”; and (iii) Petitioner fails to demonstrate that any of the references disclose combining “dynamically-generated [device-specific] limited-use payment information” with “a static limited-use payment information, to generate a complete device payment information” and

transmitting that complete device payment information as part of a payment transaction.

1. Petitioner Has Not Shown That Royyuru Discloses the “Device-Specific Static Limited-Use Payment Information” of Limitation 1(e)

Limitation 1(e) requires “retrieving from a memory attached to a processor of the device, a device-specific static limited-use payment information.” Pet., vi; Ex. 1001, 19:54-57. Claims 2-18 depend directly or indirectly from claim 1 and therefore include the same limitation. *See* Pet., vii-xi; Ex. 20:30-22:61.

Petitioner asserts that this limitation is met by the “Institution Key Card Variant (IKCV) stored on the device” in Royyuru. Pet., 20 (citing Ex. 1004, [0005]). But Royyuru never *once* states that this IKCV is “device-specific.” *See supra* Section III.A.2. To the contrary, as Petitioner acknowledges, the IKCV is “based on the PAN” (an account-specific, and not device-specific) number. Pet., 20 (citing Ex. 1004, [0055]-[0057], [0046], [0033]).

The plain and ordinary meaning of a device-specific number is a number that is uniquely associated with a specific device; not one that can be used by any other device.

Any traditional credit card would have a primary account number (PAN) printed on it. Ex. 1004, [0045] (“Traditionally, a credit card may be issued to a customer by a financial institution such as a bank Account information is usually

printed on the face of the card, specifying an account number and name of an authorized holder of the card.”) That does not necessarily mean, however, that a traditional account number is “device-specific” or “card-specific,” even if it is printed on the card itself. *See id.* There could be other uses for (or other users of) that same number in connection with a payment or transaction. For example, a traditional credit card account might have multiple cards issued with the same number, such as when a damaged card is replaced, an expired card is re-issued, or when users of a corporate card or family members share the same credit card account.

Similarly, a patent or other prior art reference disclosing a smart card with a processor and other electronic components might indicate that the primary account number is generated “for the electronic device.” But, yet again, that does not say anything about whether the account number is “device-specific,” as required by claim 1. *See Ex. 1001, 19:54-60.* The same account number could be generated for a particular account and used on multiple electronic devices such as, again, where there are multiple users sharing the same credit card account. In other words, just because the prior art reference doesn’t discuss the multiple-user scenario and only discusses a payment solution in the context of a single device, does not mean that the account number is specific to that device.

Petitioner advances just this failed logic in arguing that the IKCV of Royyuru is a device-specific number that is limited in use to payments conducted with the device. Petitioner assumes that, because Royyuru only discusses a single-card scenario and is silent on the multi-card / same account configuration, that the IKCV number is device-specific. *See* Pet., 202-22. This is simply not true. Specifically, with respect to claim 1, Petitioner cites three statements in Royyuru for the proposition that the IKCV is device-specific:

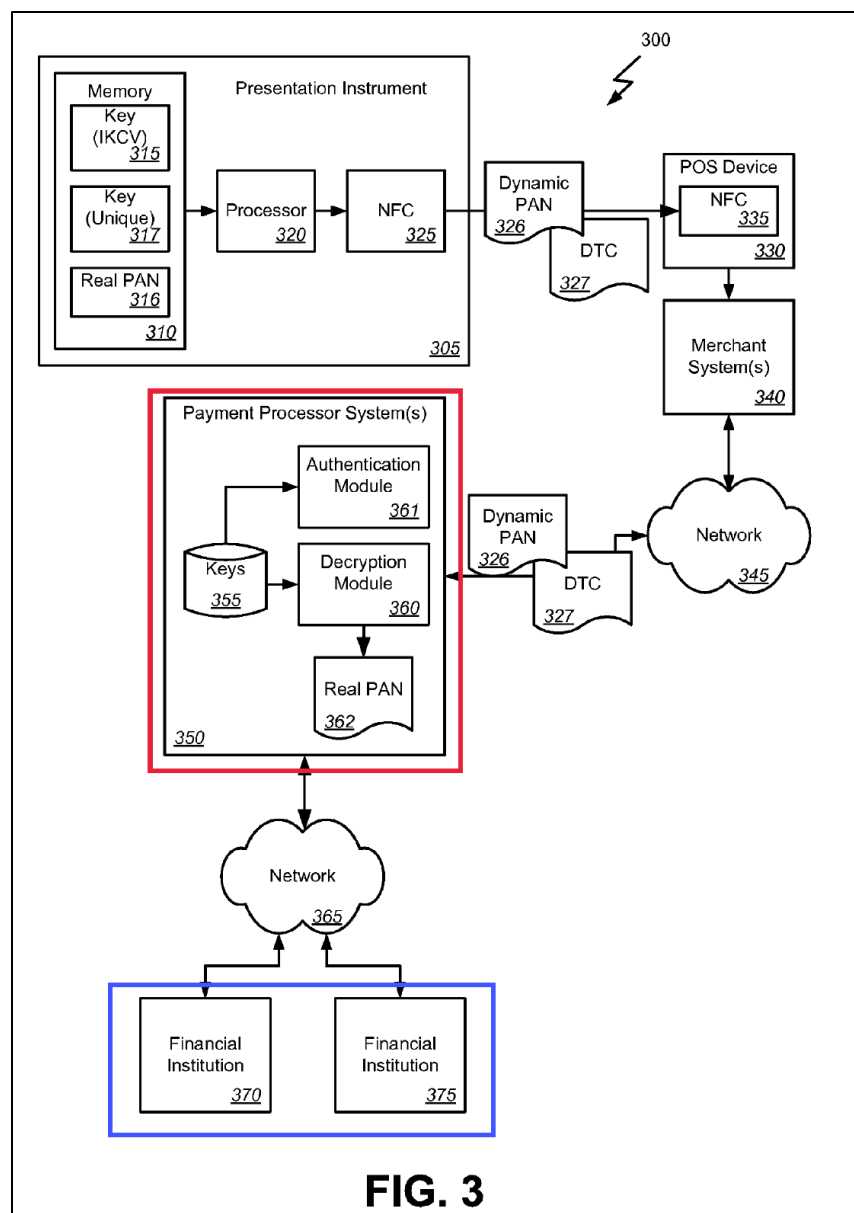
1. “Institution Key Card Variant (IKCV) stored on the device,” Pet., 20 (citing Ex. 1004, [0005]).
2. “IKCV of the device,” Pet., 20 (citing [0033], [0055]).
3. “IKCV can be generated when each card (device) is being customized,” Pet. 20 (citing Ex. 1004, [0057] (Table)).

None of these passages say anything about whether the IKCV is device-specific or whether it is also stored on and used on other devices. For example, an IKCV can be stored on a device, and *also* stored on multiple devices. The IKCV can be generated when each card is being customized, but the same IKCV can also be generated for another card, including (but not limited to) situations where an issued card is replaced, or members of the same corporation or family share the same account.

There is not a single disclosure anywhere in Royyuru saying that the IKCV is actually unique to the device. *See generally* Ex. 1004. And, there are strong indications in Royyuru that the IKCV is *not* device-specific.

First, Royyuru refers to other numbers (*not* the IKCV) as “unique” to the card or device. Specifically, Royyuru refers to a “unique, card-level key” that is separate and distinct from the IKCV. Ex. 1004, [0007], [0009], [0051]; *see also id.* [0006] (referencing “one of the card-level keys of the device (e.g., the IKCV),” thus implying multiple card-level keys). In fact, this is shown directly in Fig. 3 (and described in related text) where the “Key (Unique) 317” is separate from the “Key (IKCV) 315.” *See id.*, Fig. 3; *see also id.* [0046]-[0048] (referring to them separately). Claims 17 and 25 of Royyuru also identify these two numbers separately. *See id.*, p. 13. In contrast, Royyuru never once says that the IKCV is unique to the card or a device.

Second, Royyuru explains that the IKCV is a variant of a financial “institution key.” Ex. 1004, [0046]. It is not a variant of a device manufacturer number. The financial or other issuing institution generates the IKCV. *Id.* Figure 3 is illustrative, and shows, as highlighted, a payment processor system 350 (in red) and a financial institutions 370 and 375 (in blue). *Id.*, Fig. 3 (annotated).



The payment processor of Royyuru “refers to any entity that received purchase transaction information from a merchant or other entity and, based on account identification information, routes the transaction information over an electronic funds transfer network to an issuer of the account being used for payment.” Ex. 1004, [0020]. Again, like the financial institution, a payment processor is not a device maker (and certainly wouldn’t be in the Royyuru-Phillips

combination). The payment processor system and the financial institution are linked by network 365, which can be, for example, Visa or Mastercard. *Id.*, [0023]; *see also id.* [0044] (“It should be understood that, while illustrated here as separate networks 345 and 365, the payment processor system 350 can be coupled with the merchant system 340 and financial institutions 370 and 375 by the same network.”). The networks in turn connect to multiple financial institutions which hold user accounts and issue payment cards to users for use on these networks. *Id.*, [0023], [0044], Fig. 3.

Royyuru explains that each financial institution may have its own Institution Key (IK). Ex. 1004, [0057] (Table); *id.*, [0004]. This Institution Key “applies to many cards.” *Id.*, [0004]. In contrast, the IKCV can be derived from the institution key of the issuer of the account. *Id.*, [0005]. It can be generated “by the payment processor 350, financial institution 370 or 375 or other issuer of the instrument at the time of issuance.” *Id.*, [0046]. The IKCV is based on the real PAN (primary account number) and a KEY-ID, which is also indicative of the Institution Key (IK). *Id.*, [0057] (Table). When the payment information (dynamic PAN) is received by the payment processor, it determines the “real PAN.” “[T]he real PAN can then be sent 440 from the payment processor system to a financial institution to affect processing of the transaction.” *Id.*, [0055]. In other words, in Royyuru, the IKCV is linked to the real PAN (the actual primary account number) and not a particular

“device.” The IKCV is derived from a financial institution number—the issuer of the account—not from a device maker, or other device-specific, number.

The payment information is used to determine the “real PAN” which is in turn validated by the financial institution. This real PAN can be used by multiple users (or by a single user with multiple devices). Petitioner confuses this and calls the IKCV a device-specific number seemingly because Royyuru only discusses an embodiment with a single card, and occasionally refers to that card (which has a processor) as a device. *See* Pet., 20. But just because the IKCV correlates to the card/device in Royyuru’s examples, that doesn’t mean that it is *only* for that device, and not also used by other cards/devices, just the same as a traditional credit card number can be used by multiple users, each sharing the same account. There is absolutely nothing in Royyuru that suggests the IKCV is actually device-specific.

Because Petitioner advances no other arguments about how other references identified in Grounds 1A and 1B disclose this limitation or why a POSITA would have modified Royyuru to use a “device-specific static limited-use payment information,” Petitioner has not shown a reasonable likelihood of success as to Grounds 1A and 1B.

2. Petitioner Does Not Demonstrate How the Combination of Royyuru and Phillips Discloses a Static Device-Specific Number that is “Associated with Said Selected Payment Account”

Petitioner’s flawed argument with the IKCV becomes even more obvious when considering its re-imagined multi-account and multi-issuer device using the Royyuru-Phillips-Casey combination.

In Ground 1A, Petitioner primarily relies on Royyuru and its disclosure of a dynamic PAN and DTC in connection with completing a payment transaction (and the IKCV as the purported static device-specific number). *See* Pet., 20. But Petitioner relies on Phillips for its disclosure of selectable accounts. *See* Pet. 17-20. More specifically, Petitioner asserts that Phillips discloses a “Payment Cards’ sub-menu” showing faces of “payment card account[s] issued to” the user to allow “selection of the payment card account that corresponds to the payment card represented by the card-face image.” Pet., 18. Petitioner further asserts that a POSITA “would have modified Royyuru such that the mobile devices stores information for multiple payment options and provides a graphic interface . . . to allow user selection of a payment method.” Pet., 13. Petitioner points to Figure 8 of Phillips, and argues that “[a]llowing a user to select among multiple payment options would have provided more options with respect to how the user spent their money while allowing for the most appropriate selection for a given scenario...” Pet., 14.

But Petitioner argues no explanation of how this would work when Royyuru's IKCV is pieced together in Phillips' multi-account and multi-issuer configuration on a mobile device. *See* Pet., 13-15.

On the one hand, Royyuru discloses use of an IKCV, which is a variant of an issuer key. As noted above, this is not a device-specific number. *See supra*, Sections III.A.2, VI.A.1. But, even assuming that Petitioner is correct, and that it is somehow device-specific, Petitioner does not explain how it is "associated with said selected payment account." *See* Ex. 1001, 19:56-57. Royyuru assumes a single account per card/device. As Petitioner notes, the IKCV is "generated when each card (device) is being customized." Pet., 20 (internal quotations omitted). But Phillips contemplates a multi-account and multi-issuer configuration where a user can save and then select from many different cards and many different issuers in order to make a payment. Pet., 6; Ex. 1005, Fig. 8. In Phillips, the card accounts are clearly provided from multiple different sources and then loaded on to a single device. *See* Ex. 1005, Abstract, Fig. 8, [0029], [0035]-[0036] Claims 1, 8, 13. The cards come from financial institutions while the device comes from, per Phillips, a company like Apple. *See* Ex. 1005, [0004]-[0005], [0036], [0039]-[0040].

Petitioner does not explain how the re-imagined multi-account and multi-issuer device ends up with an IKCV that is both device-specific and "associated with said selected payment method." Pet., 13-15, 17-20. Obviously, sensitive financial

institution information is not normally shared with—or known—by device-makers, particularly where it could compromise privacy, or the security of a financial institution or a card network.

If the IKCV comes from the device maker, then there is no way for it to be “associated with said selected payment method”; the device maker has no idea what accounts a user will decide to upload and make selectable on the device. Nor do Royyuru or Phillips explain how to bridge that gap. They don’t, for example, disclose any embodiment with multiple IKCVs generated by the device maker that can each be assigned to a different selectable account (and yet be knowable by the financial institution or other entity validating a transaction).

Alternatively, if the IKCV comes from the financial institution such that it is associated with a selectable account, then it can’t possibly be device-specific, at least not in the re-imagined Royyuru-Phillips combination. The particular credit card account to which the IKCV is associated would be usable on multiple devices, including, for example, both a mobile phone and a smart watch (given that it is linked to a particular account). Petitioner does not even attempt to address these questions or otherwise articulate a manner in which the combination makes sense with use of the IKCV as a device-specific number “associated with said selected payment account.” Pet., 13-15, 17-20.

3. Petitioner Fails to Demonstrate that Any of the References in Grounds 1A and 1B Disclose Limitations 1(h) and 1(i)

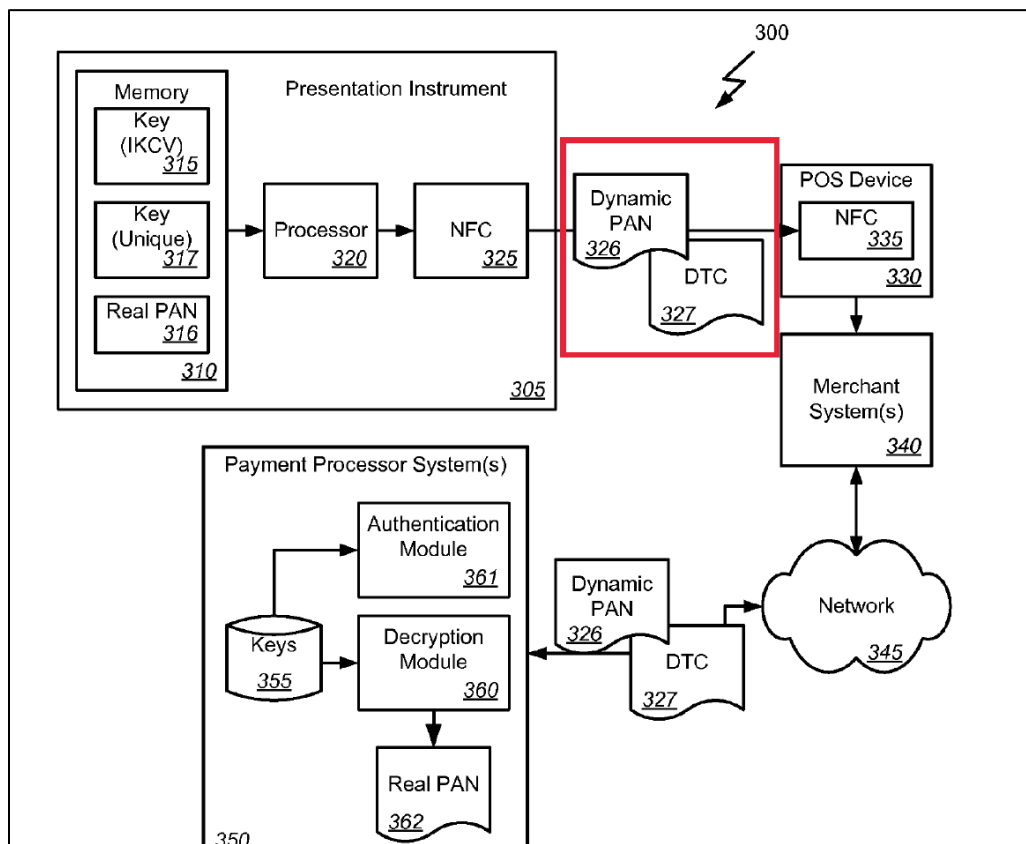
Limitation 1(h) requires “combining of said dynamically-generated limited-use payment information with said static limited-use payment information, to generate a complete device payment information.” Pet., vi; Ex. 1001, 19:64-67. “Said static limited-use payment information” refers back to the “device-specific static limited-use payment information” from limitation 1(e). See Pet., vi; Ex. 1001, 19:55-56. Limitation 1(i) then requires “transmitting said complete device payment information from said electronic device to a recipient reader via said NFC interface...” Pet., vii; Ex. 1001, 20:17-19.

By its own terms and Petitioner’s admission, Royyuru transmits two dynamic numbers—the dynamic PAN and the DTC. Pet., 22-23. This is completely clear from Figure 3, annotated below, and from Royyuru’s specification. See Ex. 1004, Abstract, Fig. 4, [0006], [0010], [0034], [0047], [0051], [0054], [0057].

Royyuru’s system explicitly outlines a scheme of ensuring both the dynamic PAN and DTC are generated entirely dynamically, each and every use, by including the application transaction counter (“ATC”) in their generation. Ex. 1004, [0051], [0057]. Simply put, Royyuru does not involve transmission of any “static” limited-use payment information.

Petitioner asserts that the IKCV in Royyuru is the “device specific static limited-use payment information.” Pet., 22. As noted above, this is wrong because

the IKCV is not device-specific and associated with a selected account. *See supra* Sections III.A.2, VI.A.1. But even assuming for argument-sake that the IKCV is both device-specific and associated with a particular account, it is *not* used in the complete payment information (the DTC and the dynamic PAN), and *not* transmitted to a recipient reader, as is clear from the portion of Figure 3 of Royyuru copied below (transmitted information in annotated in red).



Petitioner asserts that the IKCV “makes up part of the DTC.” Pet., 23. This is simply wrong. Royyuru says over and over again, including in the passages that Petitioner cites, that the DTC is generated using a “unique card level key” stored on the device. Ex. 1004, [0005], [0007], [0047], [0051], [0053],[0055], claims 16, 17,

25; *see* Pet. 20. This unique card-level key (CK) is *different than* the IKCV, as is clear throughout Royyuru and from Figure 3 in particular, where the IKCV and the “unique” key are separately identified and separately stored in memory.¹ The “Key (IKCV)” is labeled 315 and the “Key (Unique)” is labeled 317 in the memory 310 of the presentation instrument 305 of Figure 3. *See* Ex. 1004, [0046]. And, the Table in paragraph 57 discusses the IKCV and the unique card-level key (“Card-Key” or “CK”) separately; they are simply different things. *See* Ex. 1004, [0057] (Table).

Petitioner’s expert claims that the IKCV is an “example of one of the card-level keys.” Ex. 1003, ¶ 130. It is true that the IKCV is an issuer card-level key in and of itself, but it is absolutely *not* the same thing as the separately described “unique” card-level key 317 that is used to generate the DTC. Royyuru consistently indicates that the separate unique card level key (*i.e.*, “Key (Unique)” block 317 in Fig. 3) is used in generating the DTC. Ex. 1004, [0005], [0007], [0047], [0051], [0053],[0055], claims 16, 17, 25. In fact, Royyuru never once mentions the IKCV in connection with the DTC at all. *See* Ex. 1004.

¹ The IKCV is a card-level key in and of itself, but it is not the unique card-level key that is used to generate the DTC. Royyuru is consistent in this regard. *See* Ex. 1004, [0005], [0007], [0009], [0047], [0051], [0053], [0057], [0083]-[0084], Claims 16, 17, 24, 25.

Petitioner alternatively asserts that the dynamic PAN is “generated using the IKCV.” Pet., 23 (citing Ex. 1004, [0005], [0057]). This is true; per Petitioner’s cited paragraphs ([0005] and [0057]), the dynamic PAN “can be *based on* the real PAN and an Institution Key Card Variant.” But a number “based on” an IKCV is not the same as using the IKCV itself. The claim limitation requires “combining of said dynamically-generated limited-use payment information with *said* static limited-use payment information, to generate a complete device payment information.” Pet., vi; Ex. 1004, 19:64-67 (emphasis added). The 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. The IKCV may be an input to generation of the dynamic PAN, but that is it all it is. In other words, 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. Quite to the contrary, the whole idea of Royyuru is that the IKCV should *not* be transmitted—for security purposes, the payment processor system maintains institution keys corresponding to the IKCV or other card-level key used to decrypt the received dynamic PAN and determine the

real PAN.² *See* Ex. 1004, [0006], [0034], [0054]-[0055]. The payment processor generates and maintains the IKCV itself so that it can decrypt the dynamic PAN. *Id.* [0006].

B. Grounds 2A-2D Fail For Many of the Same Reasons as Grounds 1A and 1B.

Petitioner's Ground 2A asserts that Challenged Claims 19-20, 23-25, and 28-30 are obvious over a combination of Phillips, Royyuru, and Casey; Ground 2B asserts that Challenged Claims 23 and 28-30 are obvious over the same Phillips-Royyuru-Casey combination as Ground 2A, plus Rans; Ground 2C asserts that Challenged Claim 27 is obvious over the same Phillips-Royyuru-Casey-Rans combination as Ground 2B, plus Carlson; and 2D asserts that Challenged Claim 26 is obvious over the same Phillips-Royyuru-Casey combination, plus Law.

These Grounds should be rejected for many of the same reasons as with Grounds 1A and 1B.

² There are other good reasons to use a static number as part of the transmitted information to the Point of Sale terminal, including the ease of returns for a user. Royyuru itself explains this, Ex. 1004 [0032], [0033], but does not use the IKCV or a device-specific number for that purpose. *Id.*

1. Petitioner’s Arguments as it Concerns Independent Claim 25 and Dependent Claims 26-30 (Spanning Grounds 2A-2D) Fail for Mostly the Same Reasons as Grounds 1A and 1B.

With respect to independent claim 25, Petitioner mainly just cross-references its positions on claims 1 and 19. Claim 25 fails for the same reasons. Pet., 66-69.

Limitation 25(f) requires “generat[ion of] a device-specific limited-use payment information for use in place of at least a portion of said selected issuer payment account information on the device.” Pet., xv; Ex. 1004, 24:67-25:3. Petitioner cross-references its discussion of limitations 1(e) and 1(h) but, for all the reasons set out above, Petitioner did not meet its burden on these claim requirements. Pet., 68-69; *see* Sections III.A.2, VI.A.1. The IKCV of Royyuru is not “device-specific.” *See* Sections III.A.2, VI.A.1.

Nor does Petitioner offer any explanation of how the IKCV would work in connection with the multi-supplier and multi-issuer approach of Phillips. *See supra* Section VI.A.2. The IKCV stands for “institution key card variant.” Ex. 1004, [0046]. It is specific to the institution issuing the card. *See* Sections III.A.2, VI.A.1. How does this work on a device from which a user can select from multiple accounts and multiple issuing institution? Would each account from each different issuer institution have its own IKCV? Petitioner does not say, but even if the Board presumes that a POSITA would make this modification, that would only confirm

that the IKCV is clearly not device-specific (because it would be tied to each account and not the device).

Limitations 25(g) and 25(h) recite “form a complete combined payment information from a dynamically generated portion and a statically generated portions...” and wherein the communication interface is operable to transmit said complete device payment information...” Pet., xv; Ex. 1001, 25:4-10. Petitioner again just cross-references its discussion of claim 1. Pet., 68-69. As noted above, Petitioner fails to show that Royyuru transmits any complete payment information including “statically generated portions.” Royyuru only transmits two dynamic numbers. It does not transmit a static number (either the IKCV or otherwise). *See supra*, Section VI.A.3.

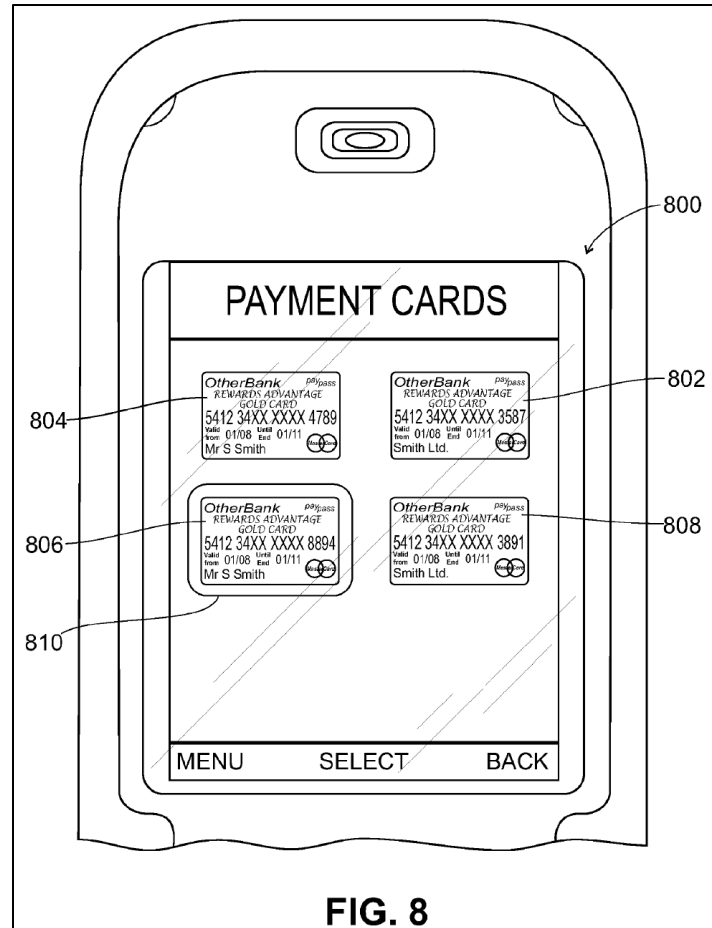
Again, Petitioner is completely wrong that the DTC includes the IKCV. The DTC includes a separate “unique” card key, that Petitioner has not argued (and cannot argue) is the device-specific limited-use payment information required by the claim. *See supra*, Section VI.A.3.

2. Petitioner Fails to Demonstrate a Reasonable Probability of Success as it Concerns Claim 19 and its Dependents (Spanning grounds 2A-2B)

a. Petitioner Does Not Explain How or Why a POSITA Would Use “Selected Account Information” with the DTC and Dynamic PAN of Royyuru, as Required by Limitation 19(f)

Limitation 19(f), requires “combining said at least one limited-use numbers, with said selected account information, to form complete payment information.” Pet., xii; Ex. 1004, 23:16-18. Per limitation 19(c), the “selected account information” refers back to the “at least one user-selectable payment account option” that is displayed to a user. Pet., xii, Ex. 1004, 23:4-7.

Petitioner asserts that limitation 19(c) is met by Phillips’ display of multiple payment cards, as shown in Figure 8, reproduced below. Pet., 53-57.



But Phillips displays *actual* payment information from an issuer, including, the real primary account number (PAN) or a portion thereof. See Ex. 1005, Fig. 8.

Phillips does not display any cryptogram or tokenized account information, and certainly does not display a dynamic transaction cryptogram (DTC), dynamic PAN, or anything resembling either of the foregoing examples from Royyuru.

Limitation 19(f) requires combining the “at least one limited-use numbers” with “said selected payment information.” Pet., xii; Ex. 1004, 23:16-18. Again, in this context, *said* “selected payment information” must be the “selected payment account option” from limitation 19(c). See Pet., xii, Ex. 1004, 23:4-7. Per Phillips, the only payment account option that is “selected” is the *actual* issuer payment information associated with the account. See *supra*, III.B. But Petitioner does not identify any *actual* payment issuer information that it believes is combined with a “limited-use number[]” to form “complete payment information.” Nor does Petitioner offer any explanation of how this would work in connection with Royyuru. See Pet., 53-57.

In other words, the whole idea of Royyuru is to transmit a DTC and a dynamic PAN. See *supra*, Section II.A.1. Is Petitioner now implicitly saying that a POSITA would *also* “combin[e]” those numbers with the selected *actual* issuer payment information to form “complete payment information” that is transmitted for an online transaction? Petitioner does not say whether additional information, and if so, what, is being added to the DTC and the dynamic PAN. Nor does Petitioner or its expert offer any explanation for why a POSITA would add *actual* issuer payment

information to Royyuru's DTC and dynamic PAN. In fact, for limitation 19(f), all that Petitioner and its expert do is refer back to their positions on limitations 1(f) through 1(h), none of which provide any answers to these questions. *See* Pet., 21-23, 57; Ex. 1003, ¶¶ 126-27, 130-31, 242.

b. Petitioner Does Not Explain How the Limited Use Number Concept of Royyuru Would Work with Multi-Account and Multi-Issuer Approach of Phillips

Limitation 19(e) requires “generating at least one limited-use numbers at said electronic device, and using said limited-use number in place of at least a portion of selected account issuer payment information.” Pet., xii; Ex. 1004, 23:11-15. Limitation 19(f) requires “combining said at least one limited-use numbers, with said selected account information, to form a complete payment information.” Pet., xii; Ex. 1004, 23:16-18.

Petitioner simply refers back to its discussion of elements 1(f) through 1(h) notwithstanding that the primary reference in that combination was Royyuru (and not Phillips). Pet., 21-23, 57. As noted with respect to those limitations, Petitioner offers no explanation of how or why a person of ordinary skill in the art would use the DTC/dynamic PAN approach of Royyuru with the multi-issuer and multi-account solution of Phillips. *See supra* Sections VI.A.2, VI.B.2.a. The whole idea of Royyuru was for a single-institution (single issuer) solution, and generation of an institution-specific key card variant (IKCV). *See supra* Section III.A. Petitioner

never explains how a re-imagined Phillips-Royyuru system would use a “limited-use number in place of at least a portion of selected account issuer payment information,” and combine that with “selected account information, to form a complete payment information.” *See* Pet., 21-23, 57.

c. Dependent Claim 21 Additionally Fails For the Same Reasons as Grounds 1A and 1B

Claim 21, which depends from claim 19, also fails for many of these same reasons as grounds 1A and 1B. Pet., xiii; Ex. 1001, 23:51. Limitation 21(a) recites a “static device account number”; limitation 21(e) requires “combining the dynamically-generated number and the static device account number within a device-generated complete payment information”; and limitation 21(f) requires “conveying” the “complete payment information...” Pet., xiii; Ex. 1001, 23:55-24:4.

Again, Petitioner mainly just cross-references its arguments regarding certain limitations in Claim 1. Pet., 61-62. For all the reasons explained above, the IKCV is not a static device account number; there is nothing in Royyuru indicating that the IKCV is connected to the particular device, and Petitioner provides no explanation of how this would work in conjunction with the multi-account and multi-issuer approach of Phillips. *See supra* Sections III.A.2; VI.A.1. Further, Royyuru never transmits combined payment information including the IKCV (Petitioner’s

purported static device account number). Petitioner is simply wrong that the IKCV is part of the DTC. It is not. *See supra* Sections VI.A.3, VI.B.1.

VII. The Board Should Exercise Its Discretion to Deny Institution Under 35 U.S.C. § 314(a)

Patent Owner respectfully submits that discretionary denial of institution under Section 314(a) is warranted based on (i) the efficient use of the Board’s time and resources and (ii) consideration of the factors set out in *Apple Inc. v. Fintiv, Inc.*, IPR2020-00019, Paper 11 (PTAB Mar. 20, 2020) (precedential).

A. The Board Should Deny Institution Based on the Efficient Use of the Board’s Time and Resources

The Board should deny institution because the vast majority—if not all—of Petitioner’s multiple challenges fail to meet the “reasonable likelihood” institution standard and, as such, institution would not be an efficient use of the Board’s time and resources.³ *See, e.g., Nanya Tech. Corp. v. Monterey Research, LLC*, IPR2021-

³ As discussed above, Patent Owner respectfully submits that Petitioner has failed to show a “reasonable likelihood” of prevailing with respect to any challenged claim under any proposed ground. Therefore, denial is warranted for that reason alone. To the extent that the Board, however, finds some challenges meet the “reasonably likelihood” standard, those are minimal, at best, and denial is still warranted as explained in this section.

00171, Paper 8, 22 (PTAB May 26, 2021) (exercising discretion under Section 314(a) to deny institution where “Petitioner could at best succeed in 8 of 41 challenges, 8 of 20 claims, and 2 of 9 Grounds” and thus “it would not be an efficient use of the Board’s time and resources to institute review”); *Google LLC v. Jawbone Innovations, LLC*, IPR2022-00888, Paper 12, 38-39 (PTAB Nov. 28, 2022) (exercising discretion under Section 314(a) to deny institution where “Petitioner fail[ed] to satisfy the ‘reasonable likelihood’ institution standard for four of the five challenges and thirteen of the fourteen challenged claims”); *NetScout Sys. Inc. v. Longhorn HD LLC*, IPR2021-01258, Paper 11, 24 (PTAB Feb. 10, 2022) (denying institution where “Petitioner fail[ed] to demonstrate a likelihood of prevailing with respect to its challenges to at least 11 of [the 12] claims.”); *Deeper, UAB v. Vexilar, Inc.*, IPR2018-01310, Paper 7, 43 (PTAB Jan. 24, 2019) (informative) (denying institution because “instituting a trial with respect to all twenty-three [challenged] claims and on all four grounds based on evidence and arguments directed to only two claims and one ground would not be an efficient use of the Board’s time and resources”); *Chevron Oronite Co. v. Infineum USA L.P.*, IPR2018-00923, Paper 9, 11 (PTAB Nov. 7, 2018) (informative) (denying institution where “Petitioner demonstrate[d], at most, a reasonable likelihood of prevailing with respect to two dependent claims out of a total of twenty challenged claims”).

B. The Board Should Deny Institution under *Fintiv*

The circumstances of the concurrent Related Litigation, *CardWare Inc. v. Samsung Electronics Co., Ltd.*, Case No. 2:22-cv-00141-JRG-RSP (E.D. Tex.), demonstrate that denial is warranted. Specifically, as set forth below, the *Fintiv* factors show that considerations of efficiency, fairness, the merits, and the integrity of the AIA strongly favor denial. *See Fintiv*, IPR2020-00019, Paper 11, 6.

1. Factor 1 is Neutral Because There is No Stay of the Parallel District Court Litigation

Petitioner moved the district court to stay the Related Litigation pending the resolution of this IPR, which motion was *denied*. Ex. 2003, 1. Even if Petitioner again moves for a stay, this factor is neutral, as any subsequent decision will come after institution, and is “based on a variety of circumstances and facts beyond [the Board’s] control and to which the Board is not privy.” *See Sand Revolution II, LLC v. Continental Intermodal Group – Trucking, LLC*, IPR2019-01393, Paper 24, 7 (PTAB Jun. 16, 2020); *Ericsson Inc. v. Collision Commc’ns, Inc.*, IPR2022-01233, Paper 12, 12 (PTAB Jan. 19, 2023).

2. Factor 2 Favors Denial Because the Board’s Written Decision Deadline Will Come Long After the Trial Date

The district court in the Related Litigation entered its Docket Control Order in October 2022, setting jury selection for February 5, 2024. Ex. 2001, 1. Pursuant to 35 U.S.C. § 316(a)(11), the projected statutory deadline for a Final Written Decision in this proceeding is over four months later in mid-June 2024.

Accordingly, this factor weighs strongly in favor of denying institution. *See Samsung Elecs. Am., Inc. v. Uniloc 2017 LLC*, IPR2019-01218, Paper 7, 7-10 (PTAB Jan. 7, 2020) (denying institution where jury selection was scheduled for approximately six months before trial in the Board proceeding would conclude); *Next Caller Inc. v. TrustID, Inc.*, IPR2019-00961, Paper 10, 8-16 (PTAB Oct. 16, 2019) (denying institution where trial was scheduled to conclude “several months before a final decision would be due”); *Cisco Sys., Inc. v. Ramot at Tel Aviv Univ. Ltd.*, IPR2020-00122, Paper 15, 8 (PTAB May 15, 2020) (“Because the trial date is substantially earlier than the projected statutory deadline for the Board’s final decision, this factor weighs in favor of discretionary denial.”).

Petitioner largely ignores the actual trial date, and relies instead on median time-to-trial statistics generally for the period from July 1, 2021 to June 30, 2022 for EDTX civil trials. Pet., 87-88. Such arguments fail for at least three reasons. First, while the Board considers the median time if before it, it is not required only to consider the median time or disregard the *actual* trial date of February 5, 2024. Ex. 1101 (Director’s Interim Procedure), 8-9. Second, Petitioner cites *no* evidence that Judge Gilstrap will not be able to meet the currently scheduled trial date, further demonstrating that the actual trial date should be the key consideration here. Third, and perhaps most importantly, if median time-to-trial is used, the more appropriate and accurate metric is to use the presiding judge’s median time-to-trial for patent

cases: Judge Gilstrap’s median time-to-trial for jury trials for patents cases filed since January 1, 2019 is 19.4 months, which is even faster than the current trial date. Ex. 2002, 1.

Factor 2 thus weighs in favor of denial.

3. Factor 3 Favors Denial Because of the Parties’ Significant Investment in the Parallel Proceeding by the Time of Institution, Including for Invalidity

The parties have already served Infringement and Invalidity Contentions, and by the time of the institution decision, document production will be substantially complete and the claim-construction process well be underway and completed shortly thereafter. Ex. 2001, 3-4. These substantial investments—including for invalidity—weigh in favor of discretionary denial. *See Sand Revolution*, IPR2019-01393, Paper 24, 10 (noting that investment in invalidity contentions is relevant to this factor).

Factor 3 weighs in favor of denial.

4. Factor 4 Favors Denial Because the District Court Litigation Involves the Same Claims and the Same Arguments and Petitioner has Only Stipulated to Very Narrow Estoppel

Petitioner offers only an extremely narrow stipulation to assert this factor favors institution. Pet., 88 (“Should IPR be instituted based on this Petition, Petitioner stipulates that it will not pursue in the Related Litigation any invalidity

grounds against the Challenged Claims of the [challenged] patent that are the same as those raised in this Petition.”). Petitioner is wrong.

With this stipulation, the likelihood of inefficiency and conflicting decisions is particularly significant because of the potential overlap of issues and because, with trial beginning February 5, 2024, the Related Litigation will have reached a final jury verdict on validity months before the statutory deadline for a Final Written Decision. Ex. 2001, 1. Indeed, Petitioner stipulated only not to pursue the *very same grounds*. This leaves open the possibility of Petitioner using the *same* art and arguments in the Related Litigation, buttressed only by an additional prior art reference, for example—which effectively nullifies the import of the stipulation.⁴

Thus, as here, “if the petition includes the same or substantially the same claims, grounds, arguments, and evidence as presented in the parallel proceeding, this fact has favor[s] denial.” *Fintiv*, IPR2020-00019, Paper 11, 12. As the Board noted in *Fintiv*, when both the district court and the Board will consider the same (or

⁴ Petitioner could have—but chose not to—offer a full-scope estoppel stipulation as the petitioner did in *Sotera Wireless, Inc. v. Masimo Corp.*, IPR2020-01019, Paper 12, 18-19 (PTAB Dec. 1, 2020) (precedential).

substantially the same) prior art and arguments, “concerns of inefficiency and the possibility of conflicting decisions [are] particularly strong.” *Id.*

Factor 4 favors discretionary denial.

5. Factor 5 Favors Denial Because the Parallel District Court Litigation and the Petition Involve the Same Parties

As noted, the pending parallel Related Litigation involves the same parties and the same challenged patent. Pet., 89. Petitioner makes no substantive argument as to this factor but wrongly asserts it is neutral. *Id.* In actual fact, this factor also weighs in favor of discretionary denial. *Ericsson*, IPR2022-01233, Paper 12, 16.

6. Factor 6 Favors Denial Because The Merits Are Weak

As shown above, the Petition lacks strength on the merits. *See supra* Sections I-VI. Factor 6 thus favors denial.

Considering all factors together—five favoring denial and one being neutral—the Petition should be denied in the Director’s discretion under 35 U.S.C. § 314(a). *See, e.g., Ericsson*, IPR2022-01233, Paper 12, 18 (denying institution where “only factor 4 weighs against discretionary denial, factor 1 is neutral, and factors 2, 3, 5, and 6 weigh in favor discretionary denial”).

VIII. Conclusion

As discussed above, Samsung’s combinations fail to disclose key limitations of each Challenged Claim of the ’538 patent, and therefore, do not render obvious any claims. Moreover, the same issues will be addressed in the District Court before

the Board can issue a Final Written Decision. The Board should, therefore, deny the Petition.

Dated: March 15, 2023

Respectfully submitted,

SHEARMAN & STERLING LLP

/s/ Matthew G. Berkowitz

Lead Counsel

Matthew G. Berkowitz (Reg. No. 57,215)

CERTIFICATE OF COMPLIANCE

I hereby certify that this paper complies with the type-volume limitation of 37 C.F.R. §42.24 (as determined by the Microsoft Word word-processing system used to prepare this paper) because it contains 8,675 words, excluding the parts of the paper exempted by 37 C.F.R. §42.24(a).

Dated: March 15, 2023

Respectfully submitted,

SHEARMAN & STERLING LLP

/s/ Matthew G. Berkowitz

Lead Counsel

Matthew G. Berkowitz (Reg. No. 57,215)

CERTIFICATE OF SERVICE

I hereby certify that the foregoing Patent Owner's Preliminary Response and Exhibits listed on the List of Exhibits were served on March 15, 2023, via electronic mail upon counsel of record for Petitioner at the following email addresses:

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