UNITED STATES PATENT AND TRADEMARK OFFICE

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BEFORE THE PATENT TRIAL AND APPEAL BOARD

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APPLE INC.,
Petitioner

v.

CARBYNE BIOMETRICS, LLC,
Patent Owner

_____

Case: IPR2024-00329
U.S. Patent No. 9,972,010

_____

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2003	*Carbyne Biometrics, LLC v. Apple Inc.*, Case No. 1:23-cv-00324, Dkt 31 (Defendant's Reply Brief In Support of Motion to Dismiss for Failure to State Claim Under 35 U.S.C. §101) (W.D. Tex. June 28, 2023).
2004	*Carbyne Biometrics, LLC v. Apple Inc.*, Case No. 1:23-cv-00324, Dkt 64 (Defendant's Opposed Motion to Stay Pending Transfer) (W.D. Tex. November 28, 2023)
2005	*Carbyne Biometrics, LLC v. Apple Inc.*, Case No. 1:23-cv-00324, Dkt 37 (Defendant's Opposed Motion to Transfer (redacted)) (W.D. Tex. July 26, 2023)
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2007	*Carbyne Biometrics, LLC v. Apple Inc.*, Case No. 1:23-cv-00324, Dkt 50(Carbyne's Response to Motion to Transfer Venue) (W.D. Tex. October 27, 2023)
2008	*Carbyne Biometrics, LLC v. Apple Inc.*, Case No. 1:23-cv-00324, Dkt 55 (Apple's Reply In Support of Its Motion to Transfer Venue) (W.D. Tex. November 10, 2023)

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2010	*Carbyne Biometrics, LLC v. Apple Inc.*, Case No. 1:23-cv-00324, Dkt 42 (Apple's Opening Claim Construction Brief) (W.D. Tex. October 4, 2023)
2011	*Carbyne Biometrics, LLC v. Apple Inc.*, Case No. 1:23-cv-00324, Dkt 49 (Carbyne's Response to Apple's Proposed Claim Construction) (W.D. Tex. October 25, 2023)
2012	*Carbyne Biometrics, LLC v. Apple Inc.*, Case No. 1:23-cv-00324, Dkt 54 (Apple's Reply Claim Construction Brief) (W.D. Tex. November 8, 2023)
2013	*Carbyne Biometrics, LLC v. Apple Inc.*, Case No. 1:23-cv-00324, Dkt 62 (Carbyne's Sur-Reply to Apple's Claim Construction Brief) (W.D. Tex. November 22, 2023)
2014	*Carbyne Biometrics, LLC v. Apple Inc.*, Case No. 1:23-cv-00324, Dkt 69 (Minute Entry re Markman Hearing and Motion to Transfer Venue) (W.D. Tex. December 12, 2023)
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2016	*Carbyne Biometrics, LLC v. Apple Inc.*, Case No. 1:23-cv-00324, Dkt 79 (Carbyne's Response to Motion to Stay Pending Written Order on Transfer) (W.D. Tex. January 24, 2024)
2017	*Carbyne Biometrics, LLC v. Apple Inc.*, Case No. 1:23-cv-00324, Dkt 80 (Apple's Reply in Support of Motion to Stay Pending Court's Written Order on Transfer) (W.D. Tex. January 24, 2024)
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2024	*Sonrai Memory Limited v. LG Electronics, Inc.* 2022 WL 2307475 (W.D. Tex. June 27, 2022)
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2027	Email Correspondence From Counsel Of Petitioner To The Board re *Sotera* Stipulations for IPRs IPR2024-00329, -00330, -00331, -00332, -00333, -00334 and-00507
2028	U.S. Patent No. 5,164,992 ("Turk Patent")
2031	CV of Dr. Michael Goodrich
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2033	*Carbyne Biometrics, LLC v. Apple Inc.*, Case No. 1:23-cv-00324, Dkt 155 (Apple Inc.'s Final Election of Asserted Prior Art) (W.D. Tex. October 23, 2024)

I. INTRODUCTION

At Petitioner Apple Inc.'s request, on July 30, 2024, the Patent Trial and Appeal Board ("Board") instituted *inter partes* review of claims 1-2, 4-7, 9-10, 12-15, 17, and 20-23 ("Challenged Claims") of U.S. Patent No. 9,972,010 ("the '010 Patent"). Carbyne Biometrics, LLC ("Patent Owner") respectfully disagrees with Petitioners' arguments and the Board's Decision. As explained in detail below, the Challenged Claims of the '010 Patent are not rendered obvious by the cited references, and their patentability should be affirmed.

II. BACKGROUND

A. The '010 Patent (Ex. 1001)

The '010 Patent is titled "Method, Medium, and System for Reducing Fraud," and claims priority from a provisional application filed on May 6, 2010. The '010 Patent provides systems and methods for preventing or reducing fraud in electronic financial transactions. *See* Ex. 1001 ('010 Patent) at abstract. As the '010 Patent observes, there are two main reasons why even an otherwise honest person would refrain from committing fraud: (1) associated feelings of guilt and (2) the risk of getting caught. *Id.* at 4:17-4:19; Ex. 2032 ¶ 30.

Electronic payment fraud presents "an ongoing problem" that is "particularly devastating" because the electronic transaction medium removes the physical barriers of a typical financial transaction and, in the process, neutralizes these

primary fraud deterrents. Ex. 1001 at 1:19, 1:24-1:27, 4:17-4:19; Ex. 2032 ¶ 31.

The electronic transaction medium does so, first, by lowering the risk that a would-be fraudster will be caught, or at least lowers the fraudster's perception of this risk, by removing the need for physical access to the victim's wallet or credit card. *See* Ex. 1001 at 1:24-1:27; Ex. 2032 ¶ 31. Second, removing the physical access requirement also dehumanizes the transaction and alleviates the potential feelings of guilt associated with perpetrating a fraud. *See* Ex. 1001 at 5:3-5:5 ("The more human the victim is made to be, the more guilty a fraudster might feel when perpetrating a fraud."). Put another way, a faceless, electronic transaction makes it easier for the fraudster to go through with the fraud. *See id.* 5:1-5:18, 6:3-6:17, 6:46-6:58; Ex. 2032 ¶ 31.

The '010 Patent seeks to curb electronic payment fraud by providing novel systems and methods by bolstering the two fraud deterrents that the electronic medium mitigates. *See* 4:17-4:19. First, the '010 Patent's claimed invention increases a potential fraudster's feelings of guilt by providing an improved graphic user interface that includes a virtual likeness of the face of an account holder whose account is engaged in an electronic transaction. *See id.* at 5:1-5:18; Ex. 2032 ¶ 32. Forcing a potential fraudster to complete a transaction while looking at a photo or other virtual likeness of the victim's face (or the potential recipient of illicit funds in a peer-to-peer cash transfer, *see id.* at 11:1-11:5) humanizes the transaction by

emphasizing the identity of the victim or account holder who will be impacted by the fraudulent transaction. Ex. 1001 at 5:15-5:18. The figures below from the ’010 Patent provide examples of a transaction interface that includes the virtual likeness of an account holder as claimed by the ’010 Patent.

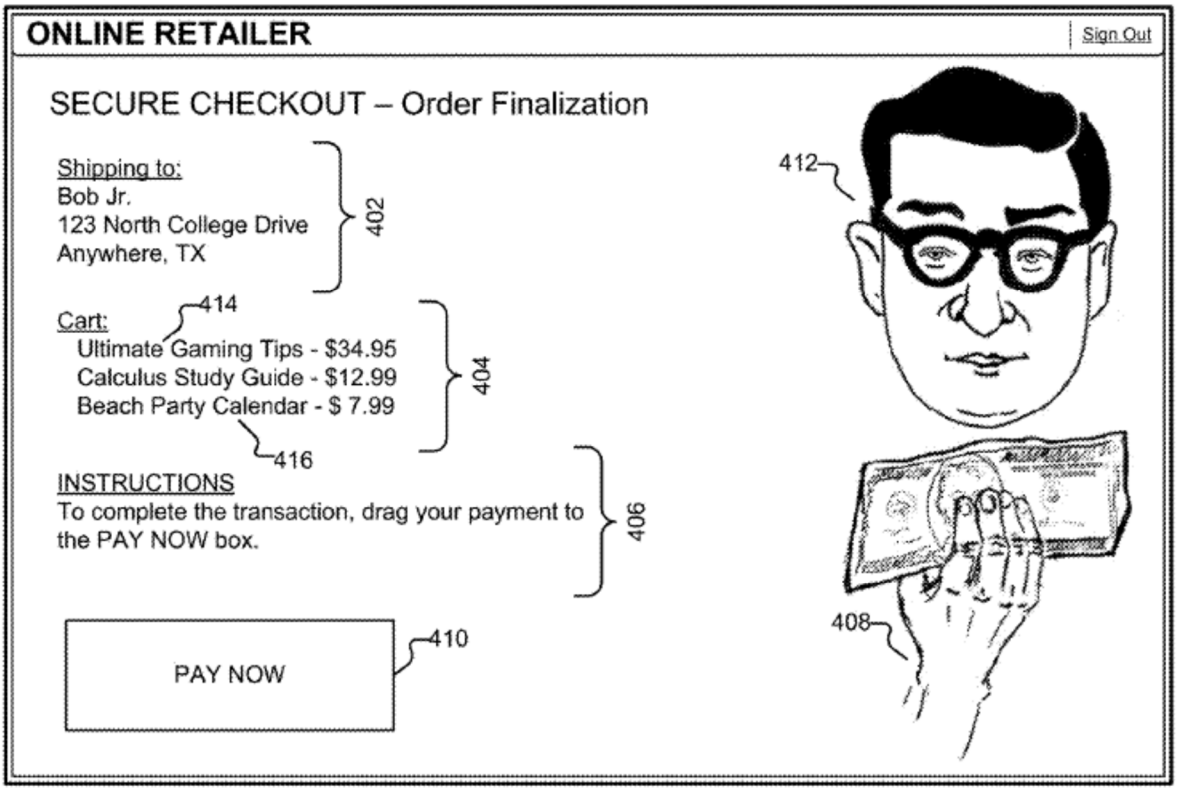


FIG. 4

Ex. 1001 at Fig. 4.

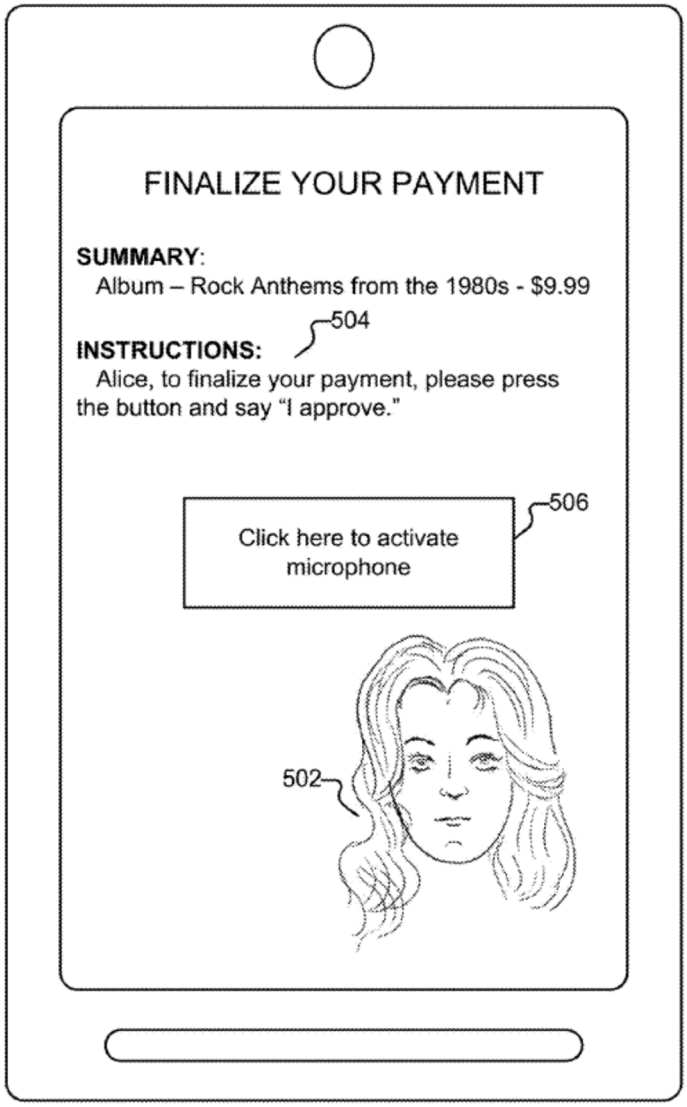


FIG. 6

Ex. 1001 at Fig. 6.

The '010 Patent's claimed systems and methods increase the fraudster's risk of being caught—real or perceived—by employing biometric authentication techniques as part of a fraud detection analysis to determine that a user is alive. *See, e.g.*, Ex.1001, cl. 1. Specifically, the '010 Patent's claimed authentication process is

as follows. The user interacts with a transaction icon in an interface containing a virtual likeness of the face of an account holder. *Id.* The user's biometric information is captured, and fraud detection analysis is performed to determine that the user is alive, based at least in part on an analysis of the biometric information collected from the user. *See id.* The electronic transaction is then completed based at least in part on both the user interaction with the transaction icon in the interface and the fraud detection analysis. *See id*.

The collected biometric information can include images of the user or an audio recording. *Id.* at 8:60-8:61, 9:4-9:6; Ex. 2032 ¶ 34. For the collection of images, techniques for confirming the object captured in the images is alive (e.g., by taking multiple photographs in rapid succession) "can be employed to help make sure that the fraudster isn't using camera 112 to photograph a printed picture of the legitimate user." *Id.* at 8:61-66. "The application of various rules, such as requiring that a face be detected in the captured image or that a certain amount of flesh tone be present in the picture can also be implemented." *Id.* 8:66-9:2. "Similar rules can be applied to other types of capture, such as requiring that a GPS be turned on prior to a transaction taking place, or requiring that provided audio conform to general rules that define what human utterances sound like." *Id.* 9:2-9:6.

In sum, the '010 Patent provides a novel approach to preventing fraud in electronic transactions by coupling an interface incorporating the virtual likeness

of an account holder to inspire feelings of guilt in a potential fraudster with biometric authentication techniques, specifically those to determine whether the user is alive, that increase the likelihood (real or perceived) that the fraud will be detected. Ex. 2032 ¶ 35.

B. Petitioner's Asserted Prior Art

The table below lists Petitioner's obviousness grounds followed by descriptions of the individual references.

Ground	Claims	Basis
1	1-2, 4-6, 9-10, 12-14, 17, 20-21, and 23	§103(a) over Stone in view of Hoyos
2	7, 15, and 22	§103(a) over Stone-Hoyos-Varghese
3	1-2, 4-7, 9-10, 12-15, 17, and 20-23	§103(a) over Stone in view of FFIEC Guidance

1. Stone (Ex. 1008)

What Petitioner identifies as the "Stone reference" is U.S. Patent Pub. No. 2010/0042535, titled "Currency Display" and assigned on its face to eBay. *See* Ex. 1008. Stone discloses systems and methods for electronic visual displays of currency. *Id.* [0002], [0006]; Ex. 2032 ¶ 37. Stone provides for an interface that displays a visual representation of the amount of currency that is subject to an electronic transaction. *Id.* at [0016]. As Stone explains, providing a visual representation of the amount in a transaction reinforces the value of the amount of money in the transaction and provides the user with a "more visually rich interface."

Id. An aspect of the system disclosed by Stone is that it enables a user's device to detect and use the currency of the country where the device is located. *Id.* at [0026]. For example, if the user is a U.S. citizen traveling in South Korea, the disclosed user display will display South Korean won instead of U.S. dollars. Ex. 1008 at [0026-30]. This feature allows a user in a foreign land to understand how much he or she is willing, or unwilling, to pay for something when bartering with local merchants. *Id.* at [0030]; Ex. 2032 ¶ 37.

The display described in Stone can also include more than just a representation of currency. *Id.* at [0021]. Some embodiments of the display can include the name and picture of the recipient in a peer-to-peer funds transfer or the user's funding source and account balance before a transaction is initiated. *Id.* at [0024].

But at its core, Stone's primary focus is providing a "more visually rich interface" that gives the user a visual representation of the amount and denomination of currency subject to a transaction, particularly where foreign currencies are involved. *See id.* at [0016], [0026]; Ex. 2032 ¶ 39.

Stone is not concerned with electronic payment fraud or how to deter it. In fact, Stone is not at all concerned with actually processing transactions, improving transaction processing, or user authentication. *See, e.g.*, Stone at [0023] ("Note that transferring funds via a mobile phone is known, such as through PayPal in San Jose, Calif. Thus, details of how funds are transferred are not described here."); Ex. 2032

¶ 40.

2. Hoyos (Ex. 1013)

Hoyos discloses systems and methods for biometric authentication in financial transactions. Ex. 1013 at [0002]. In one aspect, Hoyos discloses a method for authenticating financial transactions by acquiring biometric data from a person, calculating the probability of liveness of the person and probability of a match between the person and known biometric information. *Id.* at [0017]. Examples of the biometric inputs include photos capturing the subject's face and eyes or readings of finger and palm temperature. *Id.* at [0021]. In certain embodiments, the authentication decision is calculated using the collected biometric information to determine the probability of a match and probability of a live person based on a mathematical formula. *Id.* at [0016]-[0022]; Ex. 2032 ¶ 41.

While Hoyos describes techniques for biometric authentication, it does not suggest coupling these techniques with an improved digital interface. Nor does Hoyos even mention digital interfaces as being relevant to its claimed authentication techniques. Hoyos' proposed claims and specification focus on the above-described probability calculations used for authenticating a user. Hoyos also does not disclose employing its methods or systems in a client-server environment, but rather is focused on providing local authentication on a client device. *See, e.g.*, Hoyos at cl. 4; Ex. 2032 ¶ 42.

3. FFIEC Guidance (Ex. 1037)

Petitioner's next reference is guidance published by the Federal Financial Institutions Examination Council (FFIEC). Ex. 1037 at 1. The FFIEC is a formal interagency body of five banking regulators established in 1979 and "empowered to prescribe uniform principles, standards, and report forms for the federal examination of financial institutions." *Id.* In 2005, the FFIEC issued "guidance" for "Authentication in an Internet Banking Environment" ("FFIEC Guidance" or the "Guidance"). *See id.* The Guidance "addresses why financial institutions regulated by the agencies should conduct risk-based assessments, evaluate customer awareness programs, and develop security measures to reliably authenticate customers remotely accessing their Internet-based financial services." *Id*. The Guidance suggests that single-factor authentication (such as typed passwords) is inadequate for high-risk transactions involving access to customer information or the movement of funds to other parties. *Id.* The Guidance mentions high-level techniques and methodologies for multifactor authentication that fall into three broad categories: something a person knows (password or PIN), something a person has (a physical token or card), or something a person is (most commonly biometrics). *Id.* at 2; Ex. 2032 ¶ 43.

For biometrics, the FFIEC Guidance provides a basic description of fingerprint and facial recognition techniques and the benefits of employing these

methods. But the Guidance stops short of "endors[ing] any particular technology" or explaining how to implement any techniques, specifically as part of a digital interface. Ex. 1037 at 1. The Guidance mentions that "various biometric techniques and identifiers are being developed and tested, these include fingerprint recognition, face recognition, voice recognition, keystroke recognition, handwriting recognition, finger and hand geometry, retinal scan, and iris scan." *Id.* at 10. Of these techniques, the FFIEC states that fingerprint and face recognition are gaining acceptance, *see id.*, but the FFIEC Guidance does not state that these techniques or any biometric technique was well known or universally applied to secure electronic or online transactions; Ex. 2032 ¶ 44. The Guidance also does not discuss improvements or upgrades to digital displays in electronic transactions. Ex. 1037 at 9-11.

4. Varghese (Ex. 1010)

Varghese generally relates to "systems and methods for providing protection against identity theft over a computer network." Ex. 1010 at [0002]. It discloses multi-factor authentication for electronic transactions that uses a rules engine to score the transaction based on different criteria, including biometrics (voiceprint) and device "location fingerprint." *Id.* at Fig. 14. Varghese describes both pre- and post-authentication procedures. *Id.* at [0090]; *see also id.* at Table 3. For "pre-authentication, the most common user request is a login request to access an application or system." *Id.* at [0074]. "[R]equests usually handled by post-

authentication services include, e.g., transaction requests involving large amounts of money." *Id.* at [0074]; *see also id.* at [0099]; *see* Ex. 2032 ¶ 45.

The systems and methods Varghese discloses separate authentication into two phases: pre- and post-authentication. Pre-authentication is employed for actions such as login requests and considers identifying information of the device originating the request or information about the identity of the user. *Id.* at [0065]. Post-authentication is applied for transaction authentication requests, such as transaction requests for large amounts of money. *Id.* Post-authentication described by Varghese authenticates an individual transaction by considering historic transaction information for the user device and workflow history. *Id.*; Ex. 2032 ¶ 46.

Varghese identifies available security-relevant information related to a user request (the "request attributes") as falling into related "criteria." Ex. 1010 at [0089]. For pre- and post-authentication, different criteria are available, or of differing importance, depending on which authentication phase is being implemented. *Id.* In pre-authentication, a user is seeking to log in to an application, so the user's transaction history is unavailable, so it would not be used at this phase. *Id.*; Ex. 2032 ¶ 47. But for post-authentication, when a user is making a transaction request (e.g., a transaction request for large amounts of money), criteria for initial authentication, such as location information for the user device or the device IP address, are typically not relevant, and the user's transaction history is more relevant. *See* Ex. 1010 at

[0089]

Table 3 from Varghese presents a list of characteristics that can be used during pre-authentication and post-authentication. Petitioner's Ground 2 relies on Varghese as disclosing the "location" limitations of Challenged Claims 7, 15, and 22. Pet. 60-67; *see* Ex. 2032 ¶ 48. As Table 3 (reproduced below) shows, location information is considered in pre-authentication—for user login requests. "Location information characterizes the location of the device from which a request originates." Ex. 1010 at [0072]. "Location can most easily be estimated from the device's IP address and the hierarchy of networks linking the device to the internet." *Id.* at [0093].

TABLE 3

Example of Request Attributes

Pre-authentication	Location information	City, State, Country information and confidence factors
		Connection type
		Connection speed
		IP address, routing type, and hop times
		Internet service provider flag
		Autonomous system number
		Carrier name
		Top-level domain
		Second-level domain
		Registering organization
		A list of anonymizing proxies
		Hostnames and routers
	Device information	Secure Cookies
		Flash Cookies
		Digitally signed device
		Device & display Characteristics:
		Operating System characteristics
		Browser Characteristics
Post-authentication	User information	User identifications
		Valid or not valid user
		Authentication status
	Transaction information	Key Value Pairs:
		Support multiples
		Keys can be defined using Regular Expressions
		Values can be defined in ranges
		Pages accessed
		Time spent on page
		Transactions sequences

C. Person of Ordinary Skill in the Art

Petitioner asserts that a person of ordinary skill in the art ("POSITA") at the

time of the '010 Patent's invention would have had "a bachelor's degree in electrical engineering, computer engineering, computer science, or a related field, and at least two years of experience in the research, design, development, and/or testing of biometric authentication techniques, and related firmware and software, or the equivalent, with additional education substituting for experience and vice versa." Institution Decision (Paper 10) at 20 (quoting Pet. 4). The Board adopted Petitioner's description of a POSITA "except for the language 'at least' that qualifies the experience level and allows the experience level to encompass an expert's level of skill." Institution Decision at 21. For the purposes of this proceeding, Patent Owner and its expert have applied this level of ordinary skill in the art, as clarified in the Board's Institution Decision. *See* Ex. 2032 ¶¶ 25-28.

D. Claim Construction

The Board gives claim terms their ordinary and customary meaning as understood by a POSITA at the time of the invention in light of the patent's specification. *Phillips v. AWH Corp.*, 415 F.3d 1303, 1312-13 (Fed. Cir. 2005) (en banc); 37 C.F.R. § 42.100(b) (applying *Phillips* standard to petitions filed on or after Nov. 13, 2018). Patent Owner accepts Petitioner's position that none of the claim terms of the '010 Patent require construction. *See* Pet. at 5. Patent Owner and its expert have therefore given all claim terms their plain and ordinary meaning as understood by a POSITA at the time of the invention in light of the patent's

specification.

III. ARGUMENT

A. Ground 1: The Combination of Stone and Hoyos Does Not Render the Challenged Claims Obvious.

Petitioner's first invalidity ground asserts that independent claims 1, 9, and 17 and dependent claims 2, 4-6, 10, 12-14, 20-23 of the '010 Patent are obvious under 35 U.S.C. §103(a) over Stone in view of Hoyos. The Stone-Hoyos combination does not render any of the Challenged Claims obvious.

1. Stone in combination with Hoyos does not render the independent claims obvious.

Petitioner fails to show that the '010 Patent's independent claims 1, 9, 17 are rendered obvious by the Stone-Hoyos combination. First, the Stone-Hoyos combination does not disclose the receipt, association, and rendering of the *same* virtual likeness as required by the '010 Patent's claims. *See* Ex. 2032 ¶¶ 52-58. Second, Stone-Hoyos does not disclose "a memory coupled to the one or more processors," as required by the '010 Patent's independent claims. *Id.* ¶¶ 59-61. Finally, Petitioner fails to establish that a POSITA would have combined Stone and Hoyos resulting in the claims of the '010 Patent and would have had a reasonable expectation of success in doing so. *Id.* ¶¶ 66-83.

a) Stone-Hoyos does not disclose Limitations [1.2]-[1.5].[1]

Independent claim 1 of the ’010 Patent claims a system, comprising:

[1.1] one or more processors configured to:

[1.2] receive a virtual likeness of a face of an account holder; associate, in a data store, ***the virtual likeness of the face of the account holder*** with an account of the account holder;

[1.3] render, in an interface, ***the virtual likeness of the face of the account holder***;

[1.4] render a transaction icon associated with an electronic transaction, wherein the transaction icon is rendered in the interface with ***the virtual likeness of the face of the account holder***;

[1.5] receive an indication of an action taken by a user, the action comprising a user interaction with the transaction icon rendered in the interface with ***the virtual likeness of the face of the account holder***;

. . . .

EX-1001 at cl. 1 (emphasis added).

After the “receive a virtual likeness of a face of an account holder” limitation, the limitations that follow require that one or more processors be configured to

[1] Limitations [1.2]-[1.5] are substantially similar to limitations [9.1]-[9.4] and [17.1]-[17.4]. Patent Owner’s arguments with respect to limitations [1.2]-[1.5] thus equally apply to limitations [9.1]-[9.4] and [17.1]-[17.4].

perform several actions involving "the virtual likeness of the face of the account holder." Ex. 2032 ¶ 53.

The antecedent basis requirement is a rule of patent drafting, administered during patent examination. *Adaptix, Inc. v. Huawei Techs. Co. Ltd.*, 74 F. Supp. 3d 832, 840 (E.D. Tex. 2014). The introduction of a claim term is typically made with an indefinite article (such as "a" or "an") or without any article at all. Then, when that term is later used in the claim, the use of the definite article "the" makes clear that reference is being made back to that *same* term. *See NTP, Inc. v. Research in Motion, Ltd.*, 418 F.3d 1282, 1306 (Fed. Cir. 2005) (noting use of "a" followed by use of "the" indicates reference to the same "destination processor"); *Warner-Lambert Co. v. Apotex Corp.*, 316 F.3d 1348, 1356 (Fed. Cir. 2003) ("[I]t is a rule of law well established that the definite article 'the' particularizes the subject which it precedes."); *see* Ex. 2032 ¶ 54.

In the independent claims of the '010 Patent, the term "*a* virtual likeness of the face of *an* account holder" appears first in the claim. Then when used in the subsequent claim limitations, the term is "*the* virtual likeness of the face of the account holder." *Id.* ¶ 55. Applying the black-letter principle discussed above, the introduction of the "virtual likeness" and "account holder" terms with the indefinite articles "a" and "an" and subsequent use of the definite article "the" to modify these terms, makes clear these references are being made to the same term. Therefore, one

virtual likeness of the account holder's face must satisfy the claim element "the virtual likeness of the face of the account holder" in limitations [1.2]-[1.5]. *Id.* ¶ 55.

The Petition points to Stone as disclosing "the virtual likeness of the face of the account holder" element in imitations [1.2]-[1.5] by either a photo of the account holder on a visual representation of currency or a photo of the recipient displayed in the user interface along with a transaction icon. *See* Pet. at 29. But neither of these items is the *same* "virtual likeness" required for limitations [1.2]-[1.5]. Ex. 2032 ¶ 56.

Stone discloses that the currency display in the user interface may include a currency depicting the user's face or any other photo. *See* Stone at [0007], [0019]. However, the "photo of the user's face or other selected image" is not the same photo of the user that Petitioner identifies as disclosing "the virtual likeness of the face of the account holder" that is "received" or "associated" with the "account of the account holder" required for limitation [1.2]. Ex. 2032 ¶ 57. For this limitation, Petitioner states that Stone discloses user identifier 418, which may consist of a photo of the user and that Stone further "describes associating, using user identifier 418, in a data store (storage component 508 of user devices 404 alone, or in combination with storage component 508 of other devices including payment provider server 408), the virtual likeness of the face (photo) of the account holder (user 409) with an account (user account 422) of the account holder (user 409)." Pet.

at 28. But Stone does not disclose that the photo used for the individualized currency displayed in the interface comes from the user photo that is user identifier 418. *See* Stone at [0007], [0019]. Ex. 2032 ¶¶ 57-58.

For the "association" of the virtual likeness with the account of the account holder, Stone discloses the user's account information 424 as being maintained on payment server 408, which uses user identifier 418 (e.g., possibly a photo of the user) to associate user 409 with the user's account, as required by limitation [1.2]. *See* Pet. 26-29; Stone at [0045], [0048]. Stone does not disclose another means for associating any photo with a user's account. Stone does not disclose that a photo of the user that may be used for the individualized currency display is either user identifier 418 or otherwise associated with a user's account by payment server 408. Therefore, the photo used for the individualized currency cannot be the same virtual likeness associated with the account as required by claim 1 of the '010 Patent. Ex. 2032 ¶¶ 57-58.

Likewise, the recipient photo 202 shown in Fig. 2 of Stone is not the same "virtual likeness" required for all elements of claim 1 of the '010 Patent. Stone does not disclose that the recipient photo 202 that appears in the user interface of Figure 2 is provided to payment server 408 to be associated with a user's account information 424 maintained on payment server 408. Ex. 2032 ¶ 58. Stone does not disclose another means for associating the recipient photo with a user account. So

recipient 202, like the currency photo, cannot be the same virtual likeness associated with the account as required by claim 1 of the '010 Patent. Therefore, Stone does not disclose a virtual likeness that meets all the required elements of limitations [1.2]-[1.5] or otherwise render these limitations obvious. Petitioner's Ground 1 fails for this reason alone. *See id.*.

b) Stone-Hoyos does not disclose Limitation [1.9].

Limitation [1.9] recites "a memory coupled to the one or more processors and configured to provide the one or more processors with instructions." Petitioner contends that the embodiments disclosed in Figure 4 and Figure 5 of Stone alone or in view of Hoyos render obvious limitation [1.9]. *See* Pet. at 46-47. Petitioner identifies a memory ("memory component 506 of FIG. 5") coupled to one or more processors ("processor 504 in user device 404 alone, or in combination with other processors including the processor 504 of payment provider device 408"). *Id.* at 46. Petitioner states that Stone discloses that a "memory" is configured to provide "the one or more processors" with instructions (e.g., "instructions to create and display the proper currencies, convert currency, display various types of graphics showing transfer of currency, etc."). *Id.* (quoting Stone at [0050]).

But despite Petitioner's contention, Stone does not disclose "a memory" that is "coupled to the one or more processors" as limitation [1.9] requires. Ex. 2032 ¶ 60. The embodiment of system 500 depicted in Figure 5 of Stone may be a part of a

cell phone, personal computer, and/or a network server. *See* Stone at [0049]. Stone states that "system 500 performs specific operations by processor 504 executing one or more sequences of one or more instructions contained in the system memory component 506." Stone at [0050]. Figure 4 and Figure 5 of Stone are reproduced below.

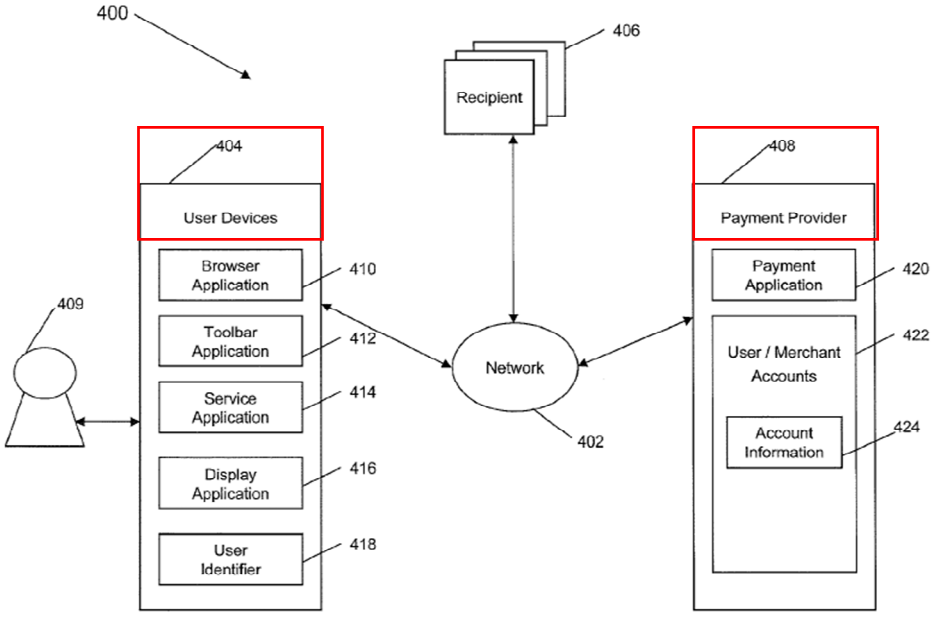


FIG. 4

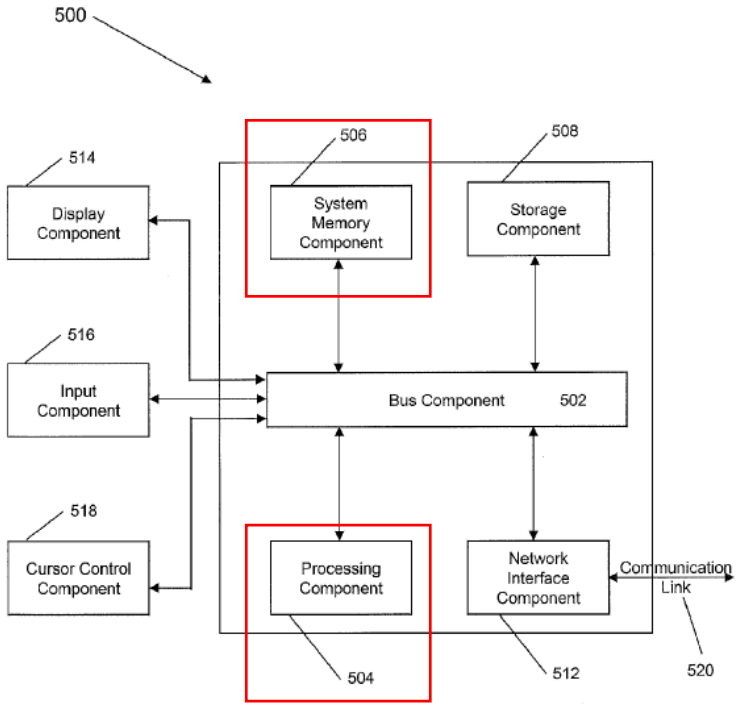


FIG. 5

For "one or more processors" in limitation [1.1], Petitioner identifies in Stone "processor 504 in user device 404 alone, or in combination with other processors including the processor 504 of payment provider device 408" as being "configured to perform processes for a transaction." Pet. at 24. But throughout the Petition, Petitioner points to both the processors for the user device 404 and payment server 408 as performing the required steps. *See, e.g.*, Pet. at 28 (citing the payment server 408 as performing "association" limitation); *see also* Stone at [0048]; Ex. 2032 ¶ 61. As limitation [1.9] requires "*a* memory coupled to *the* one or more processors," in order to disclose limitation [1.9] under Petitioner's theory, the claimed memory must be coupled to both the processor for the user device 404 and processor for the

payment server 408 as these are "*the* one or more processors" Petitioner has identified as disclosing the subsequent steps required by claim 1 of the '010 Patent. Ex. 2032 ¶ 61. In the context of the claim, a POSITA would understand a memory as needing to be coupled to both of "the one or more processors," here, the processors for the user device 404 *and* the payment server 408. But instead of a single memory coupled to both the processors for the user device and the payment server, Petitioner points to a *separate* memory (506) coupled to the processor (504) of the user device and separate memory (506) coupled to the processor (504) of the payment server. This does not disclose or render obvious "a memory coupled to the one or more processors" as required by limitation [1.9]. *See id.* at ¶¶ 59-61.

c) Petitioner fails to establish that a POSITA would have combined Stone with Hoyos and would have had a reasonable expectation of success in doing so.

Petitioner fails to establish that a POSITA would have combined Stone with Hoyos with a reasonable likelihood of success that would result in the claims of the '010 Patent. First, Petitioner's explanation for the alleged motivation to combine is conclusory. *See* Ex. 2032 ¶¶ 66-72. Stone is also not analogous art to the '010 Patent, which itself is sufficient to establish a lack of motivation to combine. *Id.* at ¶¶ 72-76. Finally, Stone and Hoyos teach away from each other in material ways that would have dissuaded a POSITA from combining their teachings to reach the '010 Patent's claims. *Id.* at ¶¶ 77-83.

(1) Petitioner's conclusory explanation for the motivation to combine is insufficient.

Petitioner's "explanations" for why a POSITA would have combined Stone and Hoyos are conclusory. "[C]onclusory assertion[s] with no explanation [are] inadequate to support a finding that there would have been a motivation to combine." *TQ Delta, LLC v. CISCO Sys., Inc.*, 942 F.3d 1352, 1356 (Fed. Cir. 2019). Petitioner's stated reasons supporting the Stone-Hoyos combination do not provide a justification for *why* a POSITA would have combined their teachings in a way that results in the '010 Patent's claims. Petitioner's explanation for why a POSITA would have combined Stone and Hoyos can be summarized as follows: "[I]t was well-known that financial transactions of Stone had a need for authentication including fraud detection (e.g., with higher levels of security for some transactions)." Pet. at 17. And "In view of Stone's need to implement authentication with fraud detection, a POSITA would have implemented biometric authentication and fraud detection as taught by Hoyos in the system of Stone." Pet. at 18.

These assertions do not explain *why* a POSITA would have combined the references. Ex. 2032 ¶¶ 67-72. Stone does not identify electronic payment fraud as a problem needing to be solved. Stone never mentions fraud, nor does it discuss any techniques for preventing fraud, like those described in Hoyos. Stone discloses an

enhanced currency display. *See* Stone at [0002] and [0016]. It is not concerned with the actual processing of transactions, *see* Stone at [0023], so a POSITA would not have been motivated to apply Hoyos's authentication techniques to Stone's teachings. *See* Ex. 2032 ¶¶ 68-70.

While Stone states that user identifier 418 "may include attributes related to the user, such as personal information (e.g., a user name, password, photograph image, biometric id, address, phone number, etc.) and banking information (e.g., banking institution, credit card issuer, user account numbers, security information, etc.), *see* Stone at [0045], Stone does not state that the user identifier is used for performing some form of authentication or fraud detection, specifically biometric-based fraud detection. Ex. 2032 ¶¶ 68-70.

Nothing in Stone substantiates that the "biometric id" or "security information" is used for transaction authentication. *Id.* ¶¶ 70-72. Further evidencing that Stone is concerned with improving the user interface and not authentication or fraud detection is the fact that in reference to the actual transfer of funds, Stone states: "Note that transferring funds via a mobile phone is known, such as through PayPal in San Jose, Calif. Thus, details of how funds are transferred are not described herein." Stone at [0023]. Declining to explain how funds are transferred, much less providing ways to improve this process, such as ways to reduce fraud, further proves

that Stone is not concerned with fraud detection or the processing of electronic transactions. Ex. 2032 ¶ 70.

Hoyos, for its part, also contains nothing to suggest a POSITA would apply its teachings to Stone. Hoyos has a limited focus—improving known biometric matching techniques by incorporating a method to determine the probability that the subject is alive. Ex. 1013 at [0016]-[0022]; Ex. 2032 ¶ 71. Hoyos is not concerned with improving a user display, specifically an electronic currency display (like that of Stone), or improving a user's experience based on providing a richer interface (like Stone). *Id.* Nothing in Hoyos would lead a POSITA to combine its biometric authentication methods with an interactive interface, particularly a currency display like the one Stone provides. *Id.*

Ultimately, Petitioner's alleged motivation to combine the references in Ground 1 is this: electronic payment fraud was a known problem, and the '010 Patent's independent claims consist of elements disclosed in Stone and Hoyos. *See* Pet. at 17-21; Ex. 2032 ¶ 72. But Petitioner's argument fails. Stone, again, was not concerned with processing or improving the processing of electronic transactions. And even if it were, known elements and a known problem without more are insufficient to establish a motivation to combine. Ex. 2032 ¶ 72; *see Virtek Vision Int'l ULC v. Assembly Guidance Sys., Inc.*, No. 2022-1998, 2024 WL 1292734, at *4 (Fed. Cir. Mar. 27, 2024) (finding no motivation to combine where limitations

were "known" in the prior art). In short, Petitioner's Ground 1 applies the same hindsight bias that the Supreme Court and Federal Circuit have routinely rejected. *See KSR Intern Co., v. Telefex Inc*, 550 U.S. 398, 421 (2007) (warning against a "temptation to read into the prior art the teachings of the invention in issue" and instructing courts to "'guard against slipping into use of hindsight'" (quoting *Graham v. John Deere Co. of Kansas City*, 383 U.S. 1, 36 (1996))). The Board should thus reject Petitioner's purported motivation to combine.

(2) Stone is not analogous art.

Petitioner's alleged motivation to combine also fails because Stone is not analogous art. The analogous art test is a "threshold" question in an obviousness analysis. *See, e.g.*, *Clay*, 966 F.2d at 658; *In re GPAC Inc.*, 57 F.3d 1573, 1577 (Fed. Cir. 1995) (analogous art inquiry is a "threshold issue"). "Generally, a skilled artisan would only have been motivated to combine analogous art." *In re Ethicon, Inc.*, 844 F.3d 1344, 1349 (Fed. Cir. 2017). The Petitioner bears the burden of establishing that a reference is analogous art. *Sanofi- Aventis Deutschland GmbH v. Mylan Pharms. Inc.*, 66 F.4th 1373, 1377 (Fed. Cir. 2023). Under the relevant test, "[p]rior art is analogous where either (1) 'the art is from the same field of endeavor, regardless of the problem addressed' or (2) even if the reference is not within the same field of endeavor, 'the reference still is reasonably pertinent to the particular problem with which the inventor is involved.'" *In re Ethicon, Inc.*, 844

F.3d 1344, 1349 (Fed. Cir. 2017) (quoting *In re Clay*, 966 F.2d 656, 658–59 (Fed. Cir. 1992)).

While the field of endeavor is "not limited to the specific point of novelty, the narrowest possible conception of the field, or the particular focus within a given field," *Unwired Planet, LLC v. Google Inc.*, 841 F.3d 995, 1001 (Fed. Cir. 2016), the field of endeavor cannot be defined "too broadly" such that it would be beyond what a POSITA would reasonably be expected to look for to find a solution to the problem facing the inventor. *See, e.g.*, *Fresenius Med. Care Holdings, Inc. v. Baxter Intern., Inc.*, No. C 03-1431 SBA, 2006 WL 1343648, at *22 (N.D. Cal. May 16, 2006) (finding petitioner failed to establish same field of endeavor was "multi-parameter medical machines" where the challenged patent defined the field of endeavor as hemodialysis and asserted prior art was cardiopulmonary bypass materials); *Procter & Gamble Co. v. Team Techs., Inc.*, No. 1:12-CV-552, 2014 WL 12656554, at *25 (S.D. Ohio July 3, 2014) (finding patents-in-suit and prior art not in same field of endeavor where patents were "directed to application of a delivery system for treating the teeth" and prior art was directed to "keeping substances off the teeth").

Petitioner cannot show that Stone satisfies either element of this test. First, Stone is not in the same field of endeavor as the '010 Patent. Ex. 2032 ¶ 74. To determine the appropriate field of endeavor, the Board refers to explanations of the

invention's subject matter in the patent application, including the embodiments, function, and structure of the claimed invention. *In re Bigio*, 381 F.3d 1320, 1325-26 (Fed. Cir. 2004). The background of the invention of the '010 Patent states that the claimed invention relates to improved techniques to prevent and detect fraud, particularly within electronic transactions. *See Airbus S.A.S. v. Firepass Corp.*, 941 F.3d 1374, 1380 (Fed. Cir. 2019) ("[S]tatements in the Background of the Invention section of the applicant's specification may be relied upon to delineate the field of endeavor.") (citations and quotations omitted). The '010 Patent's claims are also solely focused on detecting and preventing fraud—by increasing feelings of guilt and the likelihood a perpetrator will be caught—as are the specification and the disclosed embodiments. *See generally* Ex. 1001; Ex. 2032 ¶ 74-75. Stone is only concerned with providing an improved currency display. *See* Ex 1008. It "relates to electronic visual displays, and in particular, to such displays that show a visual representation of financial instruments." Ex. 1008 at [0002]. And a primary goal of Stone's claimed invention is to provide a "more visually rich interface." *Id.* at [0016]. It is not in the field of electronic fraud prevention. In fact, Stone never discusses fraud.

To the extent Petitioner may argue the relevant field of endeavor is electronic financial transactions, this is not correct. Ex. 2032 ¶ 76. As noted, Stone is not concerned with the actual processing of financial transactions or improving the

processing of financial transactions. *See* Stone at [0023]. To the extent Stone mentions financial transactions, this is tangential to Stone's primary purpose—improving a user display.

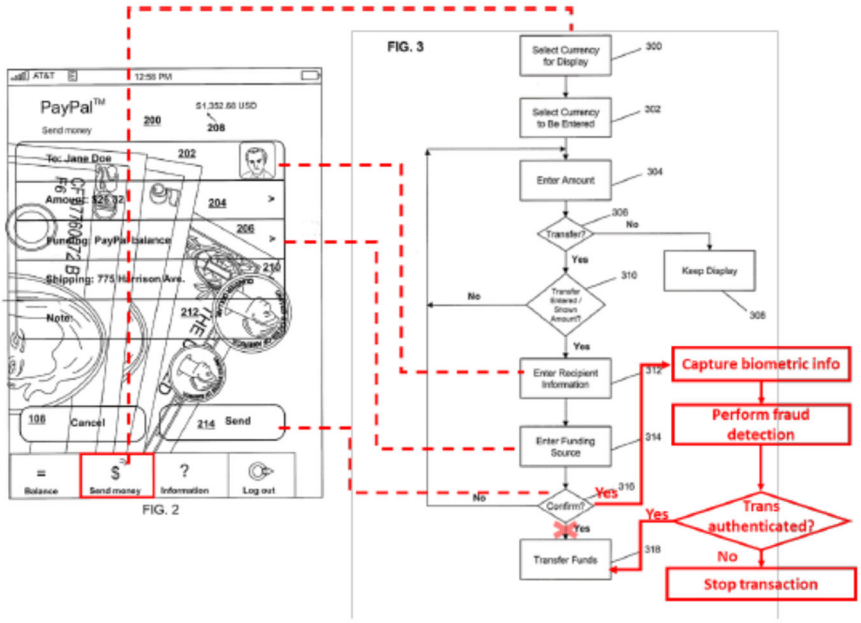
As for the second prong, Stone is not pertinent to the problem that the '010 Patent is concerned with solving—electronic payment fraud. "A reference is reasonably pertinent if . . . it is one which, because of the matter with which it deals, logically would have commended itself to an inventor's attention in considering his problem." *In re Clay,* 966 F.2d 656, 659 (Fed. Cir. 1992). "If a reference disclosure has the same purpose as the claimed invention, the reference relates to the same problem." *Id*. As just explained, the driving focus of the '010 Patent's claims is addressing the problem of electronic payment fraud. *See, e.g.*, Ex. 1001 at cl.1. Stone is not concerned with payment processing and does not even recognize payment fraud as a problem needing to be solved. Stone is therefore not analogous art to the '010 Patent, and this provides an independent basis to reject Petitioner's Ground 1. *See* Ex. 2032 ¶ 76.

(3) Stone and Hoyos teach away from each other.

"There is no suggestion to combine, however, if a reference teaches away from its combination with another source." *Tec Air, Inc. v. Denso Mfg. Mich. Inc.*, 192 F.3d 1353, 1360 (Fed. Cir. 1999). "A reference may be said to teach away when a person of ordinary skill, upon reading the reference, would be discouraged from

following the path set out in the reference, or would be led in a direction divergent from the path that was taken by the applicant." *In re Urbanski*, 809 F.3d 1237, 1244 (Fed. Cir. 2016). Here, Stone and Hoyos teach away from each other in material ways such that a POSITA would not have been motivated to combine them.

The figure below illustrates Petitioner's Stone-Hoyos electronic transaction model. The Stone interface is on the left (Fig. 2); the transaction flow chart from Stone is to the right (Fig. 3), and the biometric "authentication process" from Hoyos is inserted into the flowchart represented by the red text on the far right. Pet. at 20.



Example of Stone-Hoyos
(annotated based on APPL-1008, FIGS. 2 and 3)

As Dr. Goodrich notes, there are several problems with Petitioner's Stone-Hoyos transaction model. Ex. 2032 ¶¶ 78-83. First, Stone and Hoyos teach away from each other and are incompatible because they are directed to different

computing environments. Stone requires a client-server structure, *see* Ex. 1008 at [0040]-[0048] and Fig. 4, and Hoyos's disclosed authentication methods are employed locally on the device, with no mention of a server structure. *See, e.g.*, Hoyos cl. 4; *see also id.* at [0016]-[0022]; Ex. 2032 ¶ 78.

While Petitioner suggests that biometric authentication can be performed using either a server or client device, *see* Pet. at 22, Stone provides no basis for applying Hoyos's authentication techniques locally because Stone discloses only a client-server structure for implementing its currency display. *See* Stone at [0045]-[0048] and Fig. 4. Stone discloses that the payment server maintains the user accounts, account information, and payment applications. *See id.* So for the system of Stone to perform a transaction, communication with the server is required. Ex. 2032 ¶ 79.

Employing local biometric authentication within Stone's client-server structure also does not make sense to a POSITA. Ex. 2032 ¶¶ 80-82. For starters, this would be redundant. *South-Tek Systems, LLC v. Engineered Corrosion Solutions, LLC*, 748 Fed. Appx. 1003, 1006 (Fed. Cir. 2018) (finding lack of motivation to combine where resulting feature will be merely redundant to what the prior art device already had). As Stone Figure 2 shows, the user's account balance (208) is displayed on the interface *before* the user completes the transaction. Displaying an account balance would require some communication with the

payment server where the user's account information must be stored, *see* [0047]-[0048] and Fig. 4, well before the end of the transaction where Petitioner inserts the Hoyos "authentication process." Ex. 2032 ¶ 80. Inserting the Hoyos local, "client-only" authentication as the final step to complete the transaction would then require on-device authentication *after* the device has already transferred information in communication with payment server 408, which is redundant. *Id.* at ¶¶ 80-81.

Requiring local authentication in addition to requiring communication with a server to associate a user with their account and obtain necessary account information would also increase latency within the transaction, which undermines a primary goal of Hoyos (transaction speed) to address a problem that Stone does not even identify as a concern (electronic payment fraud), *see* Ex.1013, [0009], [0011], and would tie up processing resources on the user device that "the client-server structure is meant to free up." Ex. 2032 ¶ 81.

A POSITA also would not have been motivated to implement the aliveness determination and matching techniques from Hoyos on a client-server structure. Doing so would undermine Hoyos's stated goals of improving speed, accuracy, and security of biometric authentication. Petitioner's expert, Dr. Jones, concedes as much by listing a series of benefits derived from local authentication as Hoyos discloses. These benefits include the following:

> **reduced latency** (e.g., by minimizing communication delays between the user device and network server), **offline analysis capabilities** (allowing for analysis even when the user device is offline or has limited connectivity), **enhanced privacy** (by reducing the amount of data that needs to be transmitted to the server and minimizing potential privacy concerns), **efficient resource utilization** (helping distributing the processing load to the user device), **customization for device characteristics** (enhancing fraud detection by considering user device specific characteristics and capabilities), improved security (where a malicious actor intends to compromise the user device system), and **reduced server load for cost savings and improved scalability** (especially where the system has a large user base).
>
> Ex. 1003 at ¶ 68.

While it may be true that a "given course of action often has simultaneous advantages and disadvantages, and this does not necessarily obviate motivation to combine." *See Medichem, S.A. v. Rolabo, S.L.*, 437 F.3d 1157, 1165 (Fed Cir. 2006). The "benefits, both lost and gained, should be weighed against one another." *Winner Int'l Royalty Corp. v. Wang*, 202 F.3d 1340, 1349 n.8 (Fed. Cir. 2000). Here, every one of these benefits provided by local authentication, like that envisioned by Hoyos, is undermined by employing a server structure. Latency is increased due to the time communicating with the server. There would be no offline capability. Privacy would not be improved, given the possibility of a data breach of the server where a user's biometric information would be stored. Resources would not be efficiently used as processing power on the device would be sacrificed. Ex. 2032 ¶¶ 81-83.

Ultimately, whether the references are not in the same field, not directed at the same problem, or simply not compatible, a POSITA would not have been motivated to combine Stone and Hoyos. *See id.* at ¶¶ 66-83.

2. Stone in combination with Hoyos does not render the dependent claims obvious.

Petitioner has not shown that Stone-Hoyos renders obvious independent claims 1, 9, and 17. Because the dependent Challenged Claims depend from these independent claims, Stone-Hoyos does not render obvious any of the dependent Challenged Claims 2, 4-6, 10, 12-14, 20-21 and 23 for the same reasons Stone-Hoyos does not render obvious the independent claims. In addition, as explained below, Stone-Hoyos does not disclose the dependent limitations of claims 4, 6, 12, and 14. *See* Ex. 2032 ¶ 62-65.

a) Stone in combination with Hoyos does not disclose or render obvious "wherein the transaction icon includes a graphical representation of payment form" in claims 4 and 12.

Dependent claims 4 and 12 require the system of claim 1 (for claim 4) and the method of claim 9 (for claim 12) "wherein the transaction icon includes a graphical representation of a payment form." Neither Stone nor Hoyos discloses that a transaction icon can be a payment form. Rather, Petitioner states simply that "[i]t would have been obvious to a POSITA to implement the funding source selection [of Stone Fig. 2] using an icon with the visual representation of the payment for

improved visual presentation." Pet. at 49. But Petitioner provides no explanation or justification why this would be obvious without working backward from claim 4 of the '010 Patent using hindsight. Ex. 2032 ¶ 63.

Petitioner makes a similar argument based on Figure 3 of Stone. According to Petitioner "each icon associated with user action for blocks 300 ('Select Currency for Display') and 302 ('Select Currency to be Entered') teaches that the icon represents a form of payment, because a POSITA would have been motivated to use an icon of a form of payment (e.g., type of currency) to provide a visual indication to assist the user to select a currency at block 300 and/or 302." Pet. at 50. But, again, Petitioner's alleged justification for why a POSITA would have jumped from the flow diagram of Fig. 3 of Stone to claim 4 of the '010 Patent is nothing more than hindsight. Ex. 2032 ¶¶ 62-64.

b) Stone in combination with Hoyos does not disclose or render obvious "wherein the virtual likeness comprises an avatar selected by the account holder" in claims 6 and 14.

Dependent claims 6 and 14 require the system of claim 1 (for claim 6) and the method of claim 9 (for claim 14) "wherein the virtual likeness comprises an avatar selected by the account holder." Neither Stone nor Hoyos discloses the use of an avatar to represent an account holder. Rather, Petitioner merely states that "Stone's electronic transaction system provides a social networking aspect for connecting

people, and user-selected avatar is a well-known user icon option for online identity." Pet. 52. The fact that a claim element is well known does not render it obvious. Besides being supposedly "well known" for use on social networking sites, Petitioner provides no justification why it would be obvious to use an avatar for an electronic payment system—besides hindsight bias—to reach the invention of the '010 Patent's claim 6. Ex. 2032 ¶ 65.

B. Ground 2: The Combination of Stone in view of Hoyos and Varghese does not Render the Challenged Claims Obvious.

In its second invalidity ground, Petitioner contends that Stone in view of Hoyos and Varghese renders obvious dependent Challenged Claims 7, 15, and 22. Claims 7 and 22 depend from independent claim 1 and claim 15 depends from claim 9. Petitioner's Ground 2 relies on Stone-Hoyos as disclosing or rendering obvious the elements of the independent claims. Therefore, Petitioner's Ground 2 fails to render obvious the dependent claims 7, 15, and 22 for the same reasons explained in Ground 1.

In addition, a POSITA would not have been motivated to combine Varghese with Stone and Hoyos. Ex. 2032 ¶¶ 84-90. First, Varghese amplifies the disconnect between Stone and Hoyos regarding the server and client distinction. Varghese, like Stone, envisions a client-server structure. *See* Ex. 1010 at [0005-06]; Ex. 2032 ¶ 85. User authentication in Varghese involves information transferred from the client to

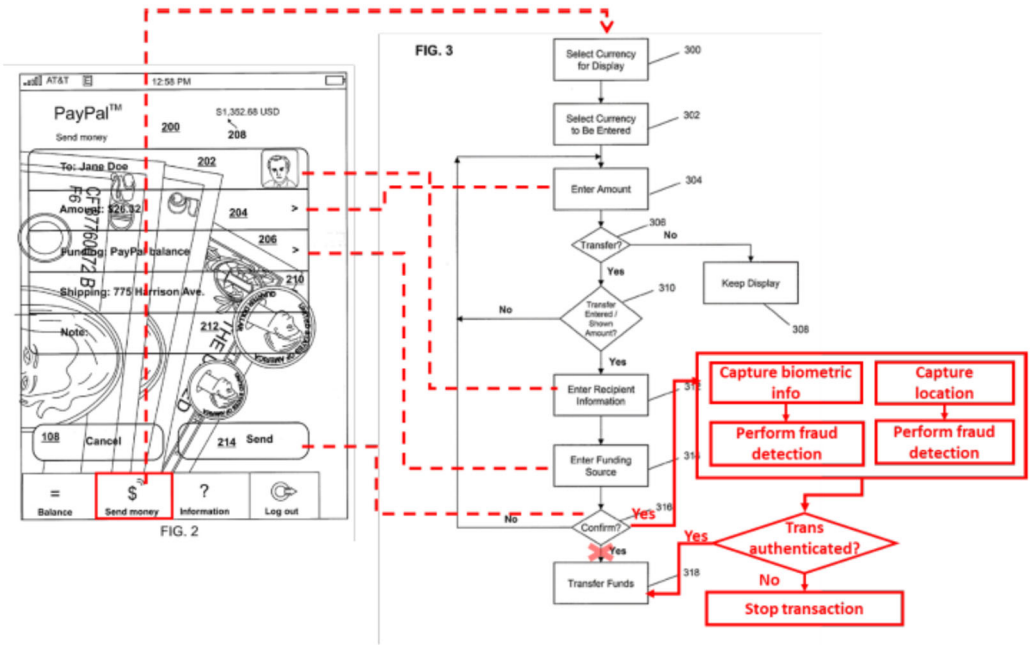
the server. So for the reasons explained in the analysis of Stone-Hoyos, it would not make sense to combine techniques performed using a client-server structure (Varghese) with techniques performed only on a client device (Hoyos) to achieve the fraud analysis provided for in the '010 Patent's claims. Ex. 2032 ¶ 85.

In addition, one of the goals of Varghese is to provide a "purely software based solution to identify theft that does not require hardware devices to be issued and maintained." Ex. 1010 at [0022]. The system envisioned by Varghese is centered on "device-based fraud monitoring" that includes "a repository of information for identifying legitimate and fraudulent users based on a more reliable and robust fingerprinting of the user device that can be integrated with other repositories of security tracking information." Varghese at [0017] and [0021]; Ex. 2032 ¶¶ 86-87. Varghese recognizes that such systems and methods were "currently lacking in the art" at the time. *Id.* at [0016]. Varghese's goal of a software-only solutions mandates a client-server structure. Ex. 2032 ¶¶ 86-87. Varghese is also concerned with using information from the user's device itself rather than the user for fraud detection, *see* Varghese at [0017] and [0021]-[0022], and not concerned with implementing or improving sensor-based biometrics, such as fingerprints and facial biometrics, on the user device that require *hardware* implementations (e.g., fingerprint scanners and forward-facing cameras). *See* Ex. 2032 ¶ 86 (citing Ex. 1013 at Fig. 2, [0018-19], [0034-36] (using camera to collect images of user for biometric authentication),

[0022] (noting probability of biometric match can be calculated by "iris recognition, fingerprint image recognition, finger vein image recognition, or palm vein image recognition")).

The hardware-based biometrics collection and authentication techniques described in Hoyos do not support Varghese's stated goal of providing a "purely software based solution to identify theft" (i.e., fraud detection), so a POSITA would not have been motivated to look to Hoyos to improve or alter the system disclosed by Varghese, specifically to reach the claimed solution of the '010 Patent claims 7, 15, and 22. Ex. 2032 ¶ 87; *see In re Urbanski*, 809 F.3d at 1244 (finding reference teaches away where a POSITA "would be discouraged from following the path set out in the reference, or would be led in a direction divergent from the path that was taken by the applicant").

Petitioner has also not established that a POSITA would have been motivated to add Varghese's location information captures to the transaction flow laid out in Stone, particularly at the final confirmation stage. *See* Ex. 2032 ¶ 88.



Example of Stone-Hoyos-Varghese
(annotated based on APPL-1008, FIGS. 2 and 3)

Varghese teaches away from applying a location check as a final step of fraud detection analysis, like that claimed by the '010 Patent. Varghese discloses a multifactor authentication framework divided into pre-authentication and post-authentication stages. Ex. 1010 at [0074] and [0090]. Pre-authentication deals with collection of information related to the user and the user's device to authenticate a user logging into a web application—focusing heavily on information collected from the user's device (e.g., device fingerprint that involves collection of IP address information, among other things.) *Id.* at [0074]. A user login is not depicted in Petitioner's combined transaction model shown above. But it would undoubtedly occur at a stage before the first step listed in the flowchart of Stone Fig. 3, as well as before the interface in Stone Fig. 2 would be presented to a user.

But most problematic for Petitioner, Varghese teaches that post-authentication is for completing monetary *electronic transactions*, which are authenticated using a user's transaction history and historic workflow. Ex. 1010 at [0065] ("User workflow sequences are authenticated (referred to herein as 'post-authentication') using a user's transaction history."). And "when a user is engaged in requesting transactions [post-authentication], criteria related to initial authentication [e.g., pre-authentication location data] are usually less important." Ex. 1010 at [0089]; Ex. 2032 ¶ 90. Based on Varghese's teaching, a POSITA would not have been motivated to collect location data (a pre-authentication technique for user login requests) to authenticate an *electronic transaction* [post-authentication request], particularly as the last step of a transaction as Petitioner claims. *Id.*

C. Ground 3: The Combination of Stone and the FFIEC Guidance Does Not Render the Challenged Claims Obvious.

Petitioner asserts that Stone in view of the FFIEC Guidance renders obvious independent claims 1, 9, and 17 and dependent claims 2, 4-7, 10, 12-15, and 20-23 of the '010 Patent. As explained below the Stone-FFIEC Guidance combination does not render the Challenged Claims obvious. Ex. 2032 ¶¶ 91-99.

1. Stone-FFIEC Guidance does not render the independent claims obvious.

Petitioner fails to show that the '010 Patent's independent claims 1, 9, 17 are invalid for at least three reasons. First, the Stone-FFIEC Guidance combination does

not disclose the receipt, association, and rendering of a virtual likeness as required by the '010 Patent's challenged claims. Ex. 2032 ¶ 92. Second, the Stone-FFIEC Guidance combination does not disclose "a memory coupled to the one or more processors as required by the '010 Patent's challenged claims. *Id.* Finally, Petitioner fails to establish that a POSITA would have combined Stone and the FFIEC Guidance and would have had a reasonable expectation in doing so. *Id.* ¶¶ 93-99.

a) Stone-FFIEC Guidance does not disclose limitations [1.2]-[1.5].

For the limitations requiring the rendering of the virtual likeness of the account holder in the interface with the transaction icon, Petitioner's Ground 3 relies on the same elements of Stone it relied on in Ground 1 as disclosing these limitations. Stone-FFIEC Guidance therefore fails to render obvious limitations [1.2]-[1.5] for the same reasons explained for Ground 1 above. Ex. 2032 ¶ 92.

b) Stone-FFIEC Guidance does not disclose limitation [1.9].

For the limitations requiring "a memory coupled to the one or more processors and configured to provide one or more processors with instructions," Petitioner's Ground 3 relies on the same elements it relied on in Ground 1 as disclosing these limitations. The Stone-FFIEC Guidance therefore fails to render obvious limitation [1.9] for the same reasons explained for Ground 1 above. *See id.*

c) Petitioner fails to establish that a POSITA would have

been motivated to combine Stone with the FFIEC Guidance and would have had a reasonable expectation of success in doing so.

Petitioner fails to establish that a POSITA would have combined Stone with the FFIEC Guidance with a reasonable likelihood of success that would result in the claims of the '010 Patent. The Petitioner's explanation for the alleged motivation to combine is conclusory. Additionally, Stone is not analogous art to the '010 Patent, which itself is sufficient to establish a lack of motivation to combine. *Id.* ¶¶ 93-99.

(1) Petitioner's conclusory explanation for the motivation to combine Stone and the FFIEC Guidance is insufficient.

Like with Stone-Hoyos, Petitioner's alleged motivation to combine Stone and the FFIEC Guidance is also conclusory. Ex. 2032 ¶ 94. It consists of four paragraphs that recite functionality and give boilerplate statements. *See* Pet. at 68-70. For example, Petitioner states that a POSITA would have understood based on the Guidance that multifactor authentication can reduce fraud and improve customer protection. *Id.* at 69; Ex. 2032 ¶ 94.

Based on this understanding, Petitioner then states that "a POSITA would have been motivated to apply, multifactor, real-time, risk-based authentication taught by the Guidance in Stone, because Stone had a need for authentication for fraud detection (e.g., with higher levels of security for higher-risk financial transactions)," and "because the Guidance was a recognized driver for

implementing multifactor authentication by a POSITA as shown in numerous articles and patent disclosures." *Id.* at 68-69.

Petitioner's assertions are conclusory and provide no actual explanation for *why* a POSITA would have combined Stone and the Guidance. Again, Petitioner presumes that Stone had a need for authentication for fraud detection. But Stone is not concerned with security of transactions. It is concerned with providing an improved display for the user and "richer interface" that provides a currency display. Ex. 1008 at [0016]. Stone also does not view fraud as a problem that needs to be addressed, with increased security, nor does it even mention electronic payment fraud. *See supra* III.A.1.c. In fact, it is telling that whenever Petitioner states the proposition that Stone had a need for fraud detection, Petitioner never once cites the Stone reference. *See, e.g.*, Pet. at 69; *see also* Ex. 2032 ¶ 96.

The FFIEC Guidance is also not concerned with the goals and purpose of Stone's disclosures. The Guidance is not concerned with conveying amounts of funds or visual representations of currency or providing a digital interface. It simply discusses biometrics and security in broad, general terms. Ex.1037 at 1-2, 9-11. The Guidance also never discusses using multifactor or biometric authentication with a digital interface, or combining these components in an ordered manner like the claims of the '010 Patent.

A POSITA also would not have combined Stone with the FFIEC Guidance because the Guidance is outside a POSITA's area of interest as defined by Petitioner. A reference is considered publicly accessible if "persons interested and ordinarily skilled in the subject matter or art, exercising reasonable diligence, can locate it." *Samsung Elecs. Co., Ltd. v. Infobridge Pte. Ltd.*, 929 F.3d 1363, 1369 (Fed. Cir. 2019). Petitioner has defined a POSITA as one holding "a bachelor's degree in electrical engineering, computer engineering, computer science, or a related field, and at least two years of experience in the research, design, development, and/or testing of biometric authentication techniques, and related firmware and software, or the equivalent." *See* Section II.C. An engineer fitting this description and exercising reasonable diligence would not have been inclined to look to high-level and non-technical regulatory guidance directed to the banking industry to develop precise technical solutions for electronic fraud. *See* Ex. 2032 ¶ 98.

Petitioner's argument, again, amounts to hindsight combination of these references to reach the limitations of the '010 Patent's independent claims without giving anything more than perfunctory statements for why a POSITA would have combined them. *See* Pet. at 68-69; Ex. 2032 ¶ 99. Pointing out that a patent's limitations were simply known across multiple prior art references does not establish a motivation to combine. *See Virtek Vision Int'l ULC*, 2024 WL

1292734, at *4 (finding no motivation to combine where limitations were "known" in the prior art). Rather, the Stone-Guidance combination was constructed in hindsight by taking the '010 Patent's claims and working backward to pull limitations from unrelated prior art references.

(2) Stone is not analogous art.

For the reasons explained in the discussion of Ground 1, Stone is not analogous art to the '010 Patent, so a POSITA would not have been motivated to combine it with the FFIEC Guidance to reach the claims of the '010 Patent.

2. Stone-FFIEC Guidance does not render the dependent claims obvious.

Petitioner has not shown that Stone-FFIEC Guidance renders obvious independent claims 1, 9, and 17. Because the dependent Challenged Claims depend from these independent claims, Stone-FFIEC Guidance does not render obvious any of the dependent Challenged Claims for the same reasons this combination does not render the independent claims obvious. Further, Stone-FFIEC Guidance does not disclose the dependent limitations of claims 4, 6, 12, and 14 for the same reasons explained in Ground 1.

IV. PETITIONER'S VIOLATION OF *SOTERA* STIPULATION

Petitioner submitted a *Sotera* stipulation in this proceeding in hopes that the Board would institute this IPR, despite the parallel Texas district court litigation

that was in its advanced stages at that time. Ex. 1048 at 1; *see* Exs. 2001-2021. Specifically, Petitioner stipulated as follows:

> Petitioner Apple Inc. ("Apple") hereby stipulates that if the Patent Trial and Appeal Board (PTAB) institutes the IPR based on the grounds identified below [ground 1—Stone and Hoyos; ground 2—Stone, Hoyos, and Varghese; and ground 3—Stone and the Guidance], then it (i) will not pursue the grounds identified below in the Parallel District Court Litigation [the Texas case] and (ii) ***will not pursue any other ground that reasonably could have been raised during the IPR (should it be instituted) in the Parallel District Court Litigation.***

Ex. 1048 at 1 (emphasis added).

Based on Petitioner's *Sotera* stipulation, the Board instituted this IPR, "declin[ing] to exercise [its] discretion under § 314(a) to deny institution in view of the Texas case." *See* Institution Decision (Paper 10) at 17-19 (citing Interim Procedure for Discretionary Denials in AIA Post-Grant Proceedings with Parallel District Court Litigation (June 21, 2022) at 3, 7, 9).

Despite its *Sotera* stipulation, Petitioner now asserts nine obviousness grounds in the parallel Texas district court litigation, all of which consist of printed publication references, or references materially identical to the printed publications, that reasonably could have been raised in this IPR. *See* Ex. 2033 (Apple Inc.'s Final Election of Asserted Prior Art). In raising these grounds, Petitioner has gone back on its stipulation to the Board (and to Patent Owner) that Petitioner made to secure institution of this IPR. Petitioner's violation of its stipulation may result in

"potentially conflicting decisions and duplicative efforts between the district court and the PTAB"—the precise harm the *Sotera* procedure is meant to avoid.

V. CONCLUSION

For the reasons provided above, Patent Owner respectfully requests that the Board find all claims of the '010 Patent valid.

Dated: October 24, 2024

Respectfully submitted,

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CERTIFICATION OF WORD COUNT

The undersigned hereby certifies that the portions of the above-captioned **PATENT OWNER'S RESPONSE** specified in 37 C.F.R. §42.24 have 9,900 words, in compliance with the 14,000 word limit set forth in 37 C.F.R. §42.24(b)(1). This word count was prepared using Microsoft Word 2010.

Dated: October 24, 2024

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CERTIFICATION OF SERVICE

The undersigned hereby certifies that a copy of this **PATENT OWNER'S RESPONSE PURSUANT TO 37 C.F.R. § 42.10(b)** has been served on Petitioner via email on the following counsel of record for Petitioner:

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