

UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE PATENT TRIAL AND APPEAL BOARD

BANK OF AMERICA, N.A., TRUIST BANK, BOKF, N.A., WELLS FARGO
BANK, N.A., and PNC BANK, N.A.,

Petitioner,

v.

DYNAPASS IP HOLDINGS, LLC

Patent Owner.

***Inter Partes* Review No. IPR2023-00367**

Patent No. 6,993,658

**PATENT OWNER'S PRELIMINARY RESPONSE TO THE PETITION
FOR *INTER PARTES* REVIEW OF U.S. PATENT NO. 6,993,658
PURSUANT TO 37 C.F.R. § 42.107**

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EXHIBIT LIST

Exhibit	Description
2001	Google Patents webpage for U.S. Patent No. 6,993,658, https://patents.google.com/patent/US6993658B1/
2002	Docket Control Order, <i>Dynapass IP Holdings, LLC v. JPMorgan Chase & Co., et al.</i> , No. 2:22-cv-00212-JRG-RSP p. 6 (E.D. Tex. Oct. 13, 2022)

I. INTRODUCTION

Dynapass IP Holdings, LLC (“Patent Owner”) respectfully submits this Preliminary Response (the “Response”) to the Petition for *Inter Partes* Review of U.S. Patent No. 6,993,658 (IPR2023-00367, the “Petition” or “Pet.”) filed by Bank of America, N.A., Truist Bank, BOKF, N.A., Wells Fargo Bank, N.A., and PNC Bank, N.A. (collectively, “Petitioners”).

Institution should be denied because the Petition fails to demonstrate a reasonable likelihood that any challenged claim of the ’658 Patent is unpatentable. Faced with novel, nonobvious claims, Petitioners engage in impermissible hindsight to pick and choose disclosures in an attempt to recreate the claimed inventions of the ’658 Patent. For example, Petitioners disregard the fact that *Guthrie* expressly teaches away from using battery powered devices, like the “mobile station” in *Sormunen* or the “PHS terminal” in *Kato*. See Ex. 1007 at 1:61-63 (“Furthermore, the card requires a battery to energize its internal circuitry. Therefore, the card has a limited life, after which a new battery must be inserted.”). Petitioners argue that “cellular networks and SMS messaging are more secure than computer networks like the Internet,” with no supporting evidence. And they ask the Board to find, again without any supporting evidence, that 1997/1998 timeframe mobile phones and pagers were capable of implementing the cryptographic algorithms that *Guthrie* only describes as being performed on a personal computer. In sum, Petitioner’s

obviousness theory is cut from whole cloth, so they cannot meet their burden of showing that the challenged claims are unpatentable.

Finally, the Petition should be denied because the Board does not have jurisdiction over expired patents. For these reasons, institution should be denied.

II. STATEMENT OF THE PRECISE RELIEF REQUESTED

Petitioners assert that claims 1-3 and 5-7 of the '658 Patent are unpatentable under the following grounds:

Ground	Claims	Reference(s)	Basis
1	1-3, 5-7	Guthrie, Sormunen	§ 103
2	1-3, 5-7	Kato, Guthrie	§ 103

Pet., p. 1.

Patent Owner requests that the Board deny institution of the Petition with respect to all challenged claims and all asserted grounds. A full statement of the reasons for the relief requested is set forth in Sections III and IV of this Response.

III. THE PETITION SHOULD BE DENIED BECAUSE IT DOES NOT ESTABLISH A REASONABLE LIKELIHOOD OF SUCCESS ON ANY CHALLENGED CLAIM.

As shown below, the Petition fails to demonstrate a reasonable likelihood that Petitioner would prevail with respect to any claim of the '658 Patent. The Petition challenges claims 1-3 and 5-7 of the '658 Patent (the "Challenged Claims"). Pet. at

1. As detailed herein, each proposed Ground fails to disclose key limitations of each Challenged Claim, so trial should not be instituted.

A. The '658 Patent

The '658 Patent, which is titled “Use of Personal Communication Devices for User Authentication,” was filed on March 6, 2000, and issued on January 31, 2006. Ex. 1001. The '658 Patent relates to “the authentication of users of secure systems and, more particularly, the invention relates to a system through which user tokens required for user authentication are supplied through personal communication devices such as mobile telephones and pagers.” Ex. 1001 at 1:7-11.

At the time of the claimed inventions, “secure systems”¹ used “a user ID and password pair to identify and authenticate system users.” *See id.* at 1:13-14. Although user ID/password pairs were ubiquitous, they suffered from several shortcomings, as recognized by the inventors of the '658 Patent:

Passwords created by users are often combinations of words and names, which are easy to remember but also easily guessed. Guessing passwords is a frequent technique used by “hackers” to break into systems. Therefore, many systems impose regulations on password formats that require mixtures of letters of different cases and symbols and that no part of a password be a word in the dictionary. A user’s inability to remember complex combinations of letters, numbers, and

¹ The '658 Patent describes many non-limiting examples of a “secure system,” including Novell NetWare-, Microsoft NT-, Windows 2000-, and UNIX/Linux-based computers, as well as “any system, device, account, “a user account on a network of computer workstations, a user account on a website, or a secure area of a building.” Ex. 1001 at 1:13-19, 4:13-23.

symbols often results in the password being written down, sometimes on a note stuck to the side of a workstation.

Id. at 1:28-38.

The increasing use of remote connectivity at the time of the claimed inventions further exacerbated the shortcomings of user ID/password pairs. *See id.*

at 1:20-26. As a result, then-current systems faced several issues:

Present systems face several problems: users dread frequent password changes, frequent password changes with hard-to-remember passwords inevitably result in users surreptitiously writing down passwords, and security is compromised when users write down their passwords.

Id. at 1:39-43. Two-factor authentication (a form of multi-factor authentication) improves user ID/password pairs by adding “unpredictable, one-time-only access codes.” *See id.* at 1:49-51. The first factor is “a user passcode or personal identification number.” *See id.* at 1:46-47. The second factor is the “unpredictable, one-time-only access codes.” *See id.* at 1:49-51. In two-factor authentication, system access is based upon:

- “nonsecret information known to the user, such as the user ID;”
- secret information known to the user, such as the passcode;” and
- “information provided to the user through an object possessed by the user, such as the token.”

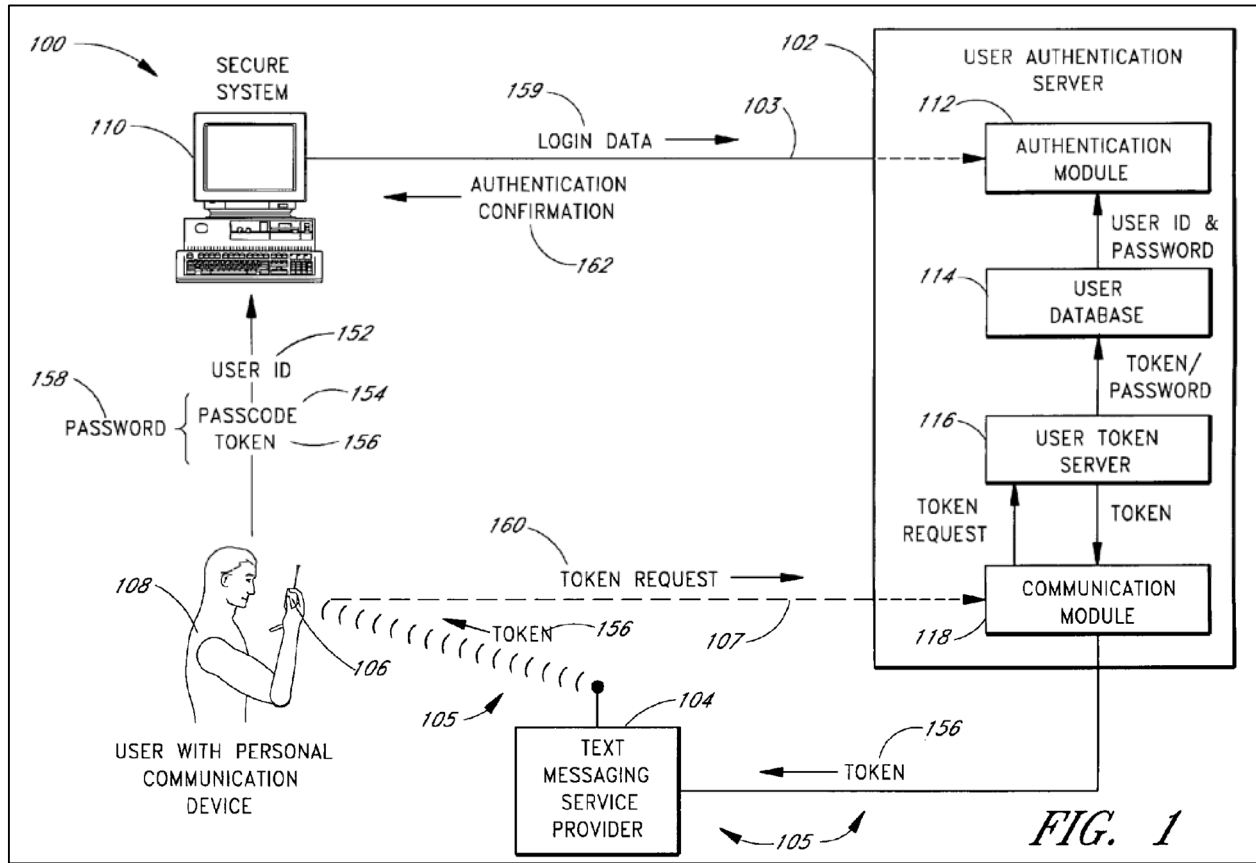
Id. at 2:11-15.

The '658 Patent acknowledges the existence of the RSA Security, Inc. SecurID product at the time of the claimed inventions, but identified significant deficiencies in the product:

The SecurID product, however, requires users to carry an additional item on their person in order to access a secure system. It would be advantageous if the benefits of the SecurID system could be achieved using a device that many users already carry—a personal communication device such as a mobile phone or a pager.

Id. at 1:54-59. The '658 Patent requires the use of a personal communication device, which teaches away from a separate device like the SecurID product. *See id.*

The '658 Patent solves the deficiencies of the SecurID product and further improves two-factor authentication in a unique, novel, non-obvious way. Figure 1 of the '658 Patent, reproduced below, depicts an embodiment of a user authentication system (identified as “100” in the figure):



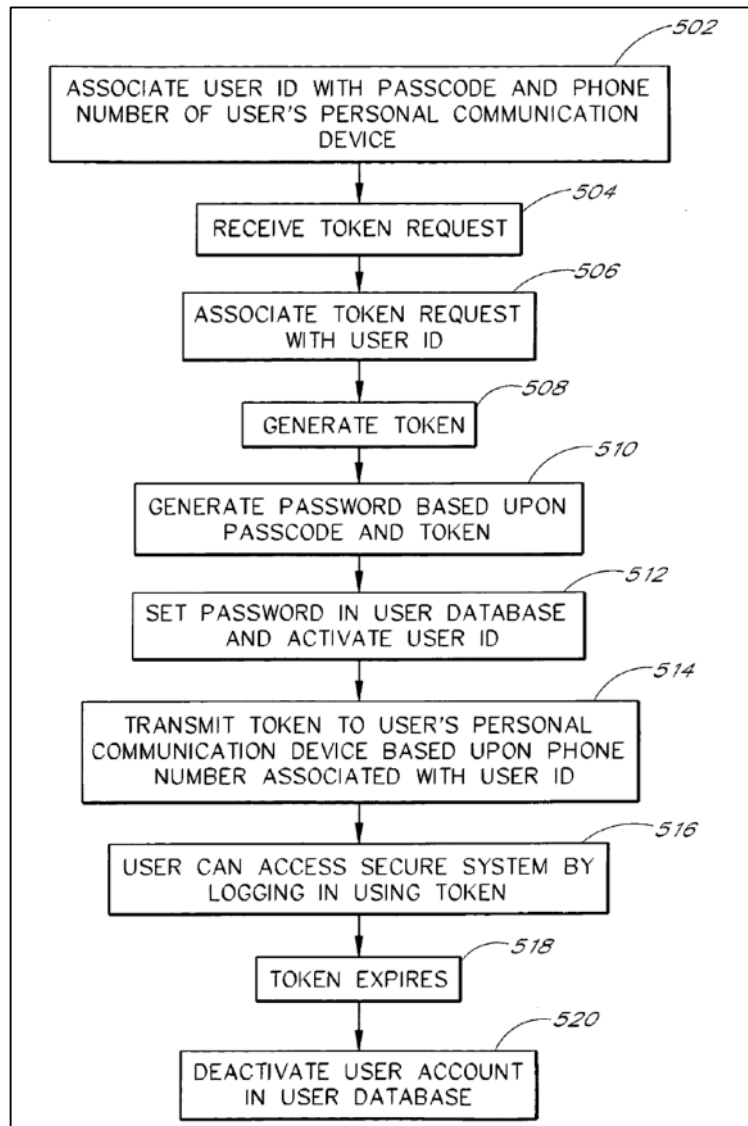
Id. at Fig. 1; *see also id.* at 3:31-33.

Authentication system (100) regulates access to secure system (110). *Id.* at 4:9-13. User authentication server (102) “preferably includes a program or a suite of programs running on a computer system to perform user authentication services.” *Id.* at 4:27-29. “The authentication information preferably includes a user ID 152, a passcode 154 and a user token 156.” *Id.* at 4:36-39. Tokens are received on the user’s personal communication device (106), which can be, for example, “a pager or mobile phone having SMS (short message service) receive capability.” *Id.* at 4:13-15.

It is important to be aware of the terminology used by the '658 Patent. The “user ID may be publicly known and used to identify the user.” *Id.* at 4:39-40. The '658 Patent uses the term “passcode” to refer to what is commonly called a “password:” “For example, the user 108 can combine a valid, memorized passcode of ‘abcd’” *Id.* 4:54-55; *see also id.* at 1:27-29 (“Passwords created by users are often combinations of words and names, which are easy to remember but also easily guessed.”), 4:40 (The passcode 154 is preferably secret and known only to the user 108.”). The “token” can be, for example, “a random or pseudo-random sequence of numbers or digits or both numbers and digits.” *Id.* at 9:22-24.

The '658 Patent uses the term “password” to refer to the combination of at least the “passcode” and a “token.” *Id.* at 4:52-53 (“In the preferred embodiment, the user 108 combines the token 156 with the passcode 154 to form a password 158.”). For example, if the passcode is “abcd” and the token is “1234,” the password could be “abcd1234” or “1234abcd.” *See id.* at 4:54-56. The components of the password (e.g., the passcode and token) can be combined or sent to the system as separate components. *See id.* at 4:52-65.

Figure 5, reproduced below, depicts an embodiment of how the system provides tokens and authenticates users.



Id. at Fig. 5; *see also id.* at 3:41-43.

In step 502, the system associates the user's user ID and passcode with the user's personal communication device. *Id.* at 8:53-60. By doing so, the system transmits the token only to the associated user. *See id.* In steps 504, 506, and 508, the system receives a request for a token, determines which user made the request (i.e., associates the request with a user ID), and generates the token. *See id.* at 9:3-

27, Fig. 5. Those steps differ from other systems that continually generate access codes. *See, e.g., id.* at 1:49-51 (“The SecurID card generates and displays unpredictable, one-time-only access codes that automatically change every 60 seconds.”). In step 510, the system generates a new “password” based on at least the “token” and “passcode.” *Id.* at 9:28-33, Fig. 5. That password is then stored and the user’s account can be activated if it was deactivated. *Id.* at 9:34-41, Fig. 5 (step 512).

In step 514, the system transmits the token to the user’s personal communication device. *See id.* at 9:44-53, Fig. 5. Claim 1 of the ’658 Patent requires that the “personal communication device” be “in communication over a second network, wherein said network is a cell phone network. . . .” *Id.* at 11:47-50. Claim 5 requires that the token is transmitted to the “personal communication device” through a “cell phone network.” *Id.* at 12:34-36. The claims also require that the user’s account is deactivated “within a predetermined amount of time” after the account is activated. *Id.* at 12:9-13 (claim 1), 12:41-47 (claim 5).

The Patent Office issued the ’658 Patent issued after several office actions. Since then, the ’658 Patent has been cited by more than 200 patent applications. Ex. 2001, <https://patents.google.com/patent/US6993658B1/>. Amongst those patent applications are patent applications filed by major industry entities, including IBM Corporation, Microsoft Corporation, Lucent Technologies, Honeywell International,

Inc., British Telecommunications PLC, AT&T, Visa, and Google Inc. *See id.* They also include a patent application filed by JPMorgan Chase Bank, N.A., a defendant in the parallel district court proceedings in the Eastern District of Texas. *See id.*

B. Level of Ordinary Skill in the Art

For the purposes of this Response only, Patent Owner does not dispute the level of skill of a person of ordinary skill in the art (“POSITA”) identified in the Petition.

C. Claim Construction

Due to the substantial deficiencies in the Petition, Patent Owner contends that claim construction is not necessary for the Board to determine that the Petition fails to demonstrate a reasonable likelihood that any challenged claim of the ’658 Patent is unpatentable. Patent Owner reserves the right to address claim construction of any term in the challenged claims if the Board institutes *inter partes* proceedings.

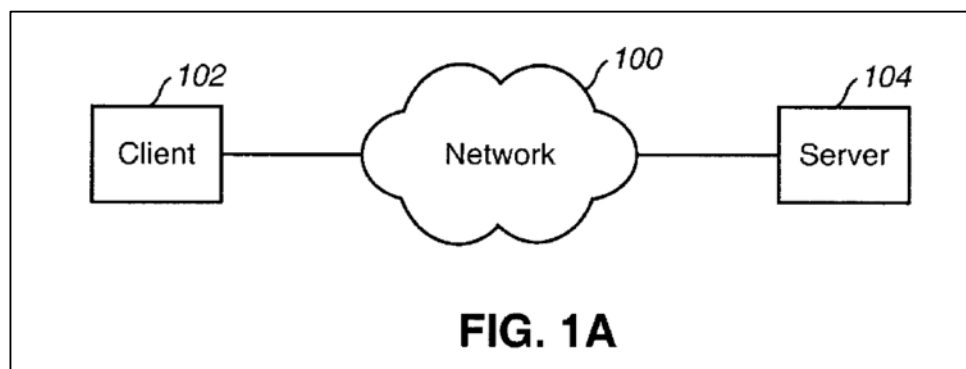
Patent Owner notes that Petitioners are defendants in parallel district court proceedings in the United States District Court for the Eastern District of Texas, Marshall Division. Those proceedings have been consolidated in *Dynapass IP Holdings, LLC v. JPMorgan Chase & Co., et al.*, No. 2:22-cv-00212-JRG-RSP (E.D. Tex.). The deadline for the parties to exchange preliminary claim constructions is June 22, 2023, and the deadline to file a joint claim construction statement is July 13, 2023, both of which are before the deadline for the Board to issue an institution

decision. Ex. 2002, Docket Control Order, *Dynapass IP Holdings, LLC v. JPMorgan Chase & Co., et al.*, No. 2:22-cv-00212-JRG-RSP p. 6 (E.D. Tex. Oct. 13, 2022); *see also* 35 U.S.C. § 314(b)(1). Petitioners represented to the Board that “[f]or this IPR, the plain meaning of each claim terms can be applied.” Pet. at 4. Patent Owner reserves its right to supplement its briefing if Petitioners adopt a claim-construction position in the district-court proceedings that is inconsistent with their representation to the Board.

D. Ground 1 – The Combination of *Guthrie* and *Sormunen* Does Not Render Obvious Claims 1-3 and 5-7 of the ’658 Patent.

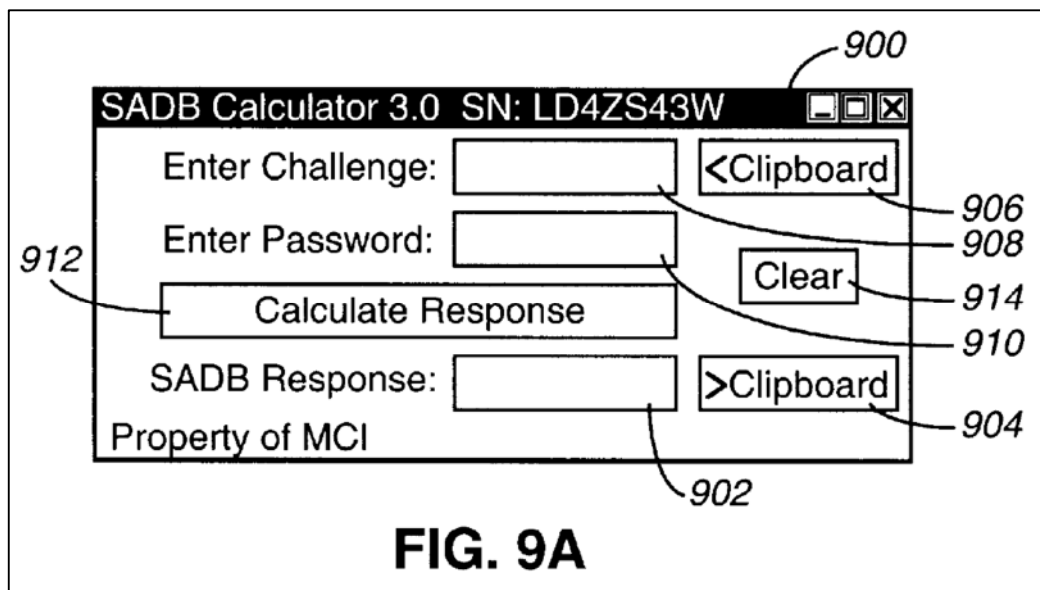
Petitioners contend that the combination of *Guthrie* and *Sormunen* renders obvious claims 1-3 and 5-7 of the ’658 Patent. Pet. at 1, 4-55. That combination does not render obvious claims 1-3 and 5-7 of the ’658 Patent for at least the following reasons.

Guthrie pertains to “electronic access systems in computers.” Ex. 1007 at 1:8-9. In *Guthrie*, the user uses a client computer (102) to authenticate with an authentication server (104). *See id.* at 4:13-27.



Id. at Fig. 1A. More specifically, the client computer and the authentication server both run applications that contain a “calculator” that is used for the authentication process—both applications calculate the “response value,” based on several inputs, and the server determines whether the “response value” received from the client computer matches the “response value” calculated by the server. *See id.* at 4:13-27.

Guthrie specifies a client computer because its authentication process requires the user interface and computing power of a computer. Figure 9A, reproduced below, depicts the user interface of the “SADB calculator” application running on a client computer:



Id. at Fig. 9A; *see also id.* at 12:43-45.

The SADB calculator uses a serial number, SADB password, and challenge as input to the SHA 128 hash algorithm, which is a cryptographic function. *See id.*

6:10-27, Fig. 3. The user interface (including the ability to copy values to and from the clipboard) is necessitated by the length of the various inputs and the response. *See id.* at Fig. 3. *Guthrie* specifies that the client computer is a DOS, UNIX, or Macintosh computer due to the requirements of providing a user interface and the processing requirements necessary to generate the response using the SHA 128 hash algorithm. *See id.* at 12:43-53. Similarly, although the authentication server does not require a user interface, it requires a at least “a DOS-based personal computer (PC),” if not “a high-grade, mid-range computer.” *See id.* at 4:50-57. All of the communications between the client computer and server take place over the same network, unlike the claims of the '658 Patent. *See, e.g., id.* at 4:65-5:1 (“Messages and other data are exchanged between the client 102 and the server 104 via the network 100. The network 100 may be a public switched telephone network (PSTN), such as in a dial-in or other access configuration.”).

Sormunen takes a very different approach from *Guthrie*. *Sormunen* discloses “a method and system for obtaining at least one item of user specific authentication data, such as a password and/or a user name.” Ex. 1018 at 1:3-5. In contrast to *Guthrie*, *Sormunen* is simply about transmitting user authentication information (e.g., username or password) to a user. In *Sormunen*, the user requests a password or list of passwords by sending a “short message” (i.e., an SMS text message) from a “mobile station” to a service. *Id.* at 5:35-38 (“For obtaining the password or list

of passwords required for using a service 1, the user of the service sends a short message 2 from a paging terminal 3, such as a mobile station.”), 6:5-7 (“For example the GSM system allows sending short message, wherein a GSM mobile station can be used in implementation of the method according to the invention.”). Rather than use a computer like *Guthrie*, *Sormunen* uses a 1997-era mobile phone to receive passwords via text message. *See id.* *Sormunen* does not require the computing power of *Guthrie*’s client computer because it does not perform hashing algorithms on multiple inputs to generate a response. *Id.* at 6:35-7:14 (disclosing that the user inputs the same password that was previously sent to the user by the short message service center: “The password server 5 transmits the password and/or the user name to the short message service center 4, which forms according to the data a reply message 6, which is sent to the paging terminal 3 preferably in enciphered form. . . . After the user has given his or her user name and the valid password, the verification service 9 transmits the given data to the service 1, which sends a check request 11 of the user name and the password to the password server 5.”) That *Sormunen* uses a mobile phone is also contrary to *Guthrie*’s express teaching away from using battery powered devices, like a mobile phone. *See Ex. 1007* at 1:61-63 (“Furthermore, the card requires a battery to energize its internal circuitry. Therefore, the card has a limited life, after which a new battery must be inserted.”). That *Sormunen* transmits passwords via text message also violates a central tenet of

Guthrie, that “the user’s authentication password is never transmitted over the network where it could be exposed or compromised.” *Id.* at 4:23-27 (emphasis added).

Despite those incompatibilities in the art, the Petition argues that it would have been obvious to combine *Guthrie* and *Sormunen* to arrive at the claimed inventions of the ’658 Patent. The applicable term for Petitioners’ obviousness argument is “impermissible hindsight,” which is improper.

1. It Would Not Have Been Obvious To Combine *Guthrie* And *Sormunen*

The Petition identifies three reasons for why it would have been obvious to combine *Guthrie* and *Sormunen*, by replacing the client computer of *Guthrie* with the “mobile station” of *Sormunen*:

- “(1) preventing transmission of authentication data over the computer network;”
- “(2) preventing transmission of the user’s secret password over any network;” and
- “(3) additionally identifying the user based on the mobile device possessed by the user.”

Pet., p. 10.

First, the Petition argues that “because Sormunen recognizes that cellular networks and SMS messaging are more secure than computer networks like the Internet, a POSITA would have been motivated to implement Sormunen’s mobile station in Guthrie to request and receive Guthrie’s challenge to prevent the challenge from being exposed over the computer network.” *Id.* That argument fails because *Sormunen* does not recognize that cellular networks and SMS messaging are more secure than computer networks. *Sormunen* states that unenciphered data (i.e., non-encrypted data) can be read when transmitted over the Internet. *See* Ex. 1018 at 3:4-5 (cited Pet., p. 11). *Sormunen* states that SMS messages sent “in enciphered form” (i.e., encrypted) are “almost impossible for outsiders to decipher.” *See id.* at 6:5-9. In other words, *Sormunen* makes the unremarkable assertion that encrypted data is more secure than unencrypted data, without making any comparison between cellular/SMS networks and computer networks. This is further shown by the fact that *Sormunen* states that its system can be implemented over an Internet connection. *See id.* at 6:12-17 (“Further, the message can be sent by forming a data transmission connection to the Internet network, to the so-called WWW (World Wide Web) page of the information service 15 provider, and giving the user authentication data as well as the number of the mobile station, to which the authentication data is transmitted preferably in a short message.”), 6:38-7:4 (“The short message service center 4 for example attends to that the short message is sent to the correct paging

terminal 3. Herein it is possible to utilize the information in the connection of the message received by the short message service center 4 from the paging terminal 3.”). Moreover, Petitioners’ argument is contrary to a related petition for *inter partes* review of the ’658 Patent where petitioner Unified Patents argued that cellular/SMS networks are less secure and subject to eavesdropping:

A POSITA would have understood that the algorithm system has the added security benefit of preventing unauthorized personnel from being able to access the system by engaging in SIM swapping. SIM swapping is a well-known trick of hackers in which they contact your service provider and activate a new SIM card on a different device in order to receive the user’s authentication token.

Unified Patents, LLC v. Dynapass IP Holdings, LLC, No. IPR2023-00425, Paper 1 p. 32 (Jan. 6, 2023).

Petitioners’ remaining support—Veneklas and Kaufman—do not contain any comparison between cellular networks and SMS messaging and computer networks, so they do not support Petitioner’s argument. *See* Ex. 1009 at 1:25-38 (Veneklas); Ex. 3:9-25 (Kaufman). And the declaration of Dr. Reiher should be afforded no weight for this argument because the declaration does nothing more restate Petitioners’ argument without any additional supporting evidence or reasoning. *Compare* Pet. pp. 10-11 with Ex. 1002 ¶64 (Reiher declaration); *Xerox Corp., et al. v. Bytemark, Inc.*, No. IPR2022-00624, Paper 9, pp. 15-16 (P.T.A.B. Aug. 24, 2022) (Precedential) (denying IPR institution – holding declaration is

entitled to little weight when it contains an exact restatement of the petition's arguments without any additional supporting evidence or reasoning).

Second, the Petition argues that “a POSITA would have recognized that maintaining Guthrie’s never-transmitted secret password, unlike Sormunen’s authentication data that is all transmitted over one network or another, would result in a more secure combined system.” Pet., p. 11. But *Guthrie* already does not transmit the user’s password. See Ex. 1007 at 4:23-27, 6:10-27, Fig. 3. So combining *Sormunen* with *Guthrie* does not address any alleged deficiency in *Guthrie*. And *Guthrie* expressly teaches away from using battery powered devices, like a mobile station. See Ex. 1007 at 1:61-63 (“Furthermore, the card requires a battery to energize its internal circuitry. Therefore, the card has a limited life, after which a new battery must be inserted.”). The declaration of Dr. Reiher should be afforded no weight for this argument because the declaration does nothing more restate Petitioners’ argument without any additional supporting evidence or reasoning. Compare Pet. pp. 11-12 with Ex. 1002 ¶65 (Reiher declaration); *Xerox Corp., et al. v. Bytemark, Inc.*, No. IPR2022-00624, Paper 9, pp. 15-16 (P.T.A.B. Aug. 24, 2022) (Precedential) (denying IPR institution – holding declaration is entitled to little weight when it contains an exact restatement of the petition’s arguments without any additional supporting evidence or reasoning).

Third, the Petition argues that “using Sormunen’s mobile station to request and receive Guthrie’s challenge further improves security by additionally verifying the user by their personal communication device.” *See* Pet., p. 12. That is because, according to Petitioners, the “only user-specific data Guthrie requires for requesting the challenge is the user account ID.” *Id.* (citing Ex. 1007, 7:60-63). But Petitioners fail to identify any evidence that requesting a challenge via a mobile station is more secure than requesting it via user account ID. *See id.* To the contrary, *Sormunen* itself allows for requesting user-authentication information over the Internet, without any mention of decreased security as a result of doing so. *See* Ex. 1018 at 6:12-17 (“Further, the message can be sent by forming a data transmission connection to the Internet network, to the so-called WWW (World Wide Web) page of the information service 15 provider, and giving the user authentication data as well as the number of the mobile station, to which the authentication data is transmitted preferably in a short message.”). And as the petitioner in *Unified Patents, LLC v. Dynapass IP Holdings, LLC* noted, SIM swapping can be used to send/receive SMS messages, nullifying the alleged benefit put forth by Petitioners here. *See Unified Patents, LLC v. Dynapass IP Holdings, LLC*, No. IPR2023-00425, Paper 1 p. 32 (Jan. 6, 2023). Here again, the declaration of Dr. Reiher should be afforded no weight for this argument because the declaration does nothing more restate Petitioners’ argument without any additional supporting evidence or reasoning. *Compare* Pet. pp. 12-13

with Ex. 1002 ¶66 (Reiher declaration); *Xerox Corp., et al. v. Bytemark, Inc.*, No. IPR2022-00624, Paper 9, pp. 15-16 (P.T.A.B. Aug. 24, 2022) (Precedential) (denying IPR institution – holding declaration is entitled to little weight when it contains an exact restatement of the petition’s arguments without any additional supporting evidence or reasoning).

The Petition also argues that a POSITA would have had a reasonable expectation of success in combining *Guthrie* and *Sormunen*, by replacing the client computer of *Guthrie* with the “mobile station” of *Sormunen*. Pet., pp. 13-15. Petitioner argues that a POSITA would have had a reasonable expectation of success because “Guthrie’s server can receive and send short messages in the same way as Sormunen’s password server,” through ISDN lines. *See id.* at 13-14. But Petitioners’ cited evidence in *Guthrie* discloses using ISDN lines for only dial-in (i.e., voice) applications. *See id.* (citing Ex. 1007 at 5:30-32, 13:48-53); Ex. 1007 at 5:30-32, 13:48-53. By contrast, *Sormunen* discloses using the ISDN connection for data. *See id.* (citing Ex. 1018 at 8:15-18); Ex. 1018 at 8:15-18 (“The data transmission connection 13 between the short message service center 4 and the password server 5 can be for example a direct connection by using ISDN/LAN (Integrated Services Digital Network / Local Area Network) or a corresponding connection.”). Here again, the declaration of Dr. Reiher should be afforded no weight for this argument because the declaration does nothing more restate Petitioners’

argument without any additional supporting evidence or reasoning. *Compare* Pet. pp. 13-14 *with* Ex. 1002 ¶67 (Reiher declaration); *Xerox Corp., et al. v. Bytemark, Inc.*, No. IPR2022-00624, Paper 9, pp. 15-16 (P.T.A.B. Aug. 24, 2022) (Precedential) (denying IPR institution – holding declaration is entitled to little weight when it contains an exact restatement of the petition’s arguments without any additional supporting evidence or reasoning). Accordingly, Petitioners’ argument is baseless.

The Petition also argues that “A POSITA would have further had a reasonable expectation of success in implementing Guthrie’s challenge-response process using the mobile device of Sormunen (adding Sormunen’s mobile station to Guthrie) by either (1) having the mobile station receive the challenge, but implementing Guthrie’s SADB calculator on Guthrie’s client after the user manually enters the received challenge on the client; or (2) having the mobile station implement Guthrie’s SADB calculator and then having the user enter the resulting response on Guthrie’s client.” Pet., p. 14. A POSITA would not have had a reasonable expectation of success with the first implementation because *Guthrie* expressly teaches away from using battery powered devices, like a mobile station. *See* Ex. 1007 at 1:61-63 (“Furthermore, the card requires a battery to energize its internal circuitry. Therefore, the card has a limited life, after which a new battery must be inserted.”).

A POSITA would not have had a reasonable expectation of success of the second implementation—having *Sormunen*’s mobile station implement *Guthrie*’s SADB calculator. The crux of Petitioners’ argument is that in the 1997/1998 timeframe mobile phones and pagers (i.e., *Sormunen*’s “mobile station”) had the equivalent processing power of a personal computer (i.e., *Guthrie*’s “client computer”), without any supporting evidence. Petitioners argue that “*Guthrie* discloses that its SADB calculators can be implemented as software on various platforms, including a ‘palm top computer.’” Pet., p. 15 (citing Ex. 1007 at Abstract, 3:59-63, 4:8-13, 5:18-22, 5:48-6:9, 12:43-53, 13:16-20). But the only computers identified are personal computers: “The user 114 may use more than one client computer 102 to access the server 104 (e.g., via a home computer, office computer, lap top computer, palm top computer, etc.” Ex. 1007 at 6:1-9. And the operating systems identified for providing the user interface for the SADB calculator are personal-computer operating systems (DOS, UNIX, Macintosh), not mobile phone/operating systems. *Id.* at 12:43-53. Petitioners attempt to rewrite *Sormunen* by arguing that “a ‘palm top computer’ is a mobile computer like *Sormunen*’s mobile station,” without any citations to *Sormunen* itself. See Pet., p. 15. That is because *Sormunen* describes the “mobile station” only in terms of mobile phones and pagers, without any reference to palm top computers. See Ex. 1018 at 4:30-5:8, 6:5-7, Figs. 2 & 3.

Petitioners rely on the *Falk* reference to argue that “mobile stations were known to perform hash algorithms.” Pet., p. 15 (citing Ex. 1015 at 3:4-20, 4:19-45). But *Falk* does not support Petitioners’ argument because it does not describe any “hash algorithms” (the word “hash” does not appear anywhere in the reference), let alone the SHA 128 algorithm used in *Guthrie*. See Ex. 1015 at 3:4-20, 4:19-45. Moreover, *Falk* describes itself as “a modified pager,” which contradicts Petitioners’ argument that a standard pager or mobile phone could implement *Guthrie*’s SADB calculator. See *id.* at Abstract. Moreover, Petitioners do not cite any evidence that the “mobile station” of *Sormunen* could provide the graphical user interface required for the SADB calculator. See Pet., p. 15. Here again, the declaration of Dr. Reiher should be afforded no weight for this argument because the declaration does nothing more restate Petitioners’ argument without any additional supporting evidence or reasoning. Compare Pet. p. 15 with Ex. 1002 ¶70 (Reiher declaration); *Xerox Corp., et al. v. Bytemark, Inc.*, No. IPR2022-00624, Paper 9, pp. 15-16 (P.T.A.B. Aug. 24, 2022) (Precedential) (denying IPR institution – holding declaration is entitled to little weight when it contains an exact restatement of the petition’s arguments without any additional supporting evidence or reasoning). Accordingly, Petitioners’ argument is baseless.

2. Independent Claim 1

The combination of *Guthrie* and *Sormunen* does not render obvious independent claim 1 because the combination does not teach or suggest the following elements of the claim.

- i. 1[a] “associating the user with a personal communication device . . . wherein said second network is a cell phone network different from the first computer network”

Claim element 1[a] recites “associating the user with a personal communication device . . . wherein said second network is a cell phone network different from the first computer network.” Petitioners argue that this limitation is met by “Sormunen’s mobile station” as combined in the Petition. *See* Pet., p. 19. But it would not have been obvious to combine *Sormunen*’s “mobile station” with *Guthrie* for the reasons identified above in Section III.D.1. Accordingly, the combination of *Guthrie* and *Sormunen* does not teach or suggest claim element 1[a].

- ii. 1[b] “receiving a request from a user for a token via the personal communication device, over the second network”

Claim element 1[b] recites “receiving a request from a user for a token via the personal communication device” Petitioners argue that this limitation is met by “Sormunen’s mobile station” as combined in the Petition. *See* Pet., pp. 22-23. But it would not have been obvious to combine *Sormunen*’s “mobile station” with *Guthrie* for the reasons identified above in Section III.D.1. Accordingly, the combination of *Guthrie* and *Sormunen* does not teach or suggest claim element 1[b].

- iii. 1[f] “transmitting the token to the personal communication device”

Claim element 1[f] recites “transmitting the token to the personal communication device.” Petitioners argue that this limitation is met by “Sormunen’s mobile station” as combined in the Petition. *See* Pet., p. 33. But it would not have been obvious to combine *Sormunen*’s “mobile station” with *Guthrie* for the reasons identified above in Section III.D.1. Accordingly, the combination of *Guthrie* and *Sormunen* does not teach or suggest claim element 1[f].

3. Dependent Claims 2 and 3

Dependent claims 2 and 3 depend from and add limitations to independent claim 1. The combination of *Guthrie* and *Sormunen* fails to render obvious claim 1 unpatentable, therefore, the combination of *Guthrie* and *Sormunen* fails to render obvious dependent claims 2 and 3 for at least the same reasons.

4. Independent Claim 5

The combination of *Guthrie* and *Sormunen* does not render obvious independent claim 5 because the combination does not teach or suggest the following elements of the claim.

- i. 5[b] “a user database configured to associate a user with a personal communication device possessed by the user . . .”

Claim element 5[b] recites “a user database configured to associate a user with a personal communication device possessed by the user, said personal

communication device configured to communicate over a cell phone network with the user authentication system.” Petitioners argue that this limitation is met by “Sormunen’s mobile station” as combined in the Petition. *See* Pet., pp. 45-47. But it would not have been obvious to combine *Sormunen*’s “mobile station” with *Guthrie* for the reasons identified above in Section III.D.1. Accordingly, the combination of *Guthrie* and *Sormunen* does not teach or suggest claim element 5[b].

- ii. 5[e] “a communication module configured to transmit the token to the personal communication device through the cell phone network”

Claim element 5[e] recites “a communication module configured to transmit the token to the personal communication device through the cell phone network.” Petitioners argue that this limitation is met by “Sormunen’s mobile station” as combined in the Petition. *See* Pet., pp. 49-50. But it would not have been obvious to combine *Sormunen*’s “mobile station” with *Guthrie* for the reasons identified above in Section III.D.1. Accordingly, the combination of *Guthrie* and *Sormunen* does not teach or suggest claim element 5[e].

5. Dependent Claims 6 and 7

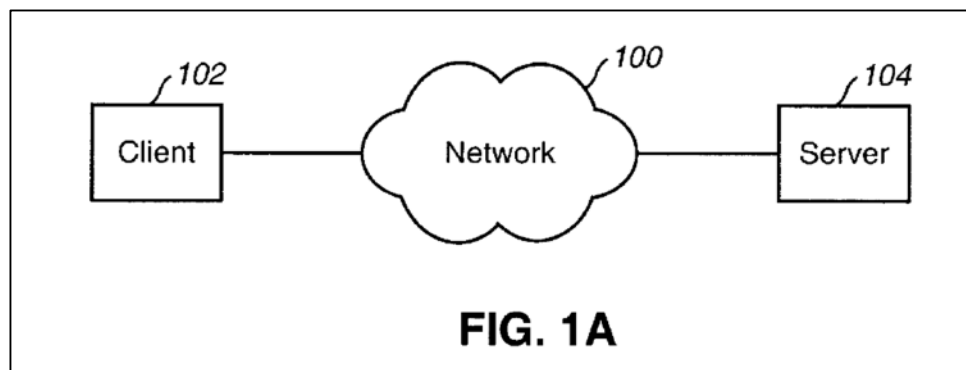
Dependent claim 6 depends from and adds limitations to independent claim 1, and dependent claim 7 depends from and adds limitations to dependent claim 6. The combination of *Guthrie* and *Sormunen* fails to render obvious claim 1

unpatentable, therefore, the combination of *Guthrie* and *Sormunen* fails to render obvious dependent claims 6 and 7 for at least the same reasons.

E. Ground 2 – The Combination of *Kato* and *Guthrie* Does Not Render Obvious Claims 1-3 and 5-7 of the '658 Patent.

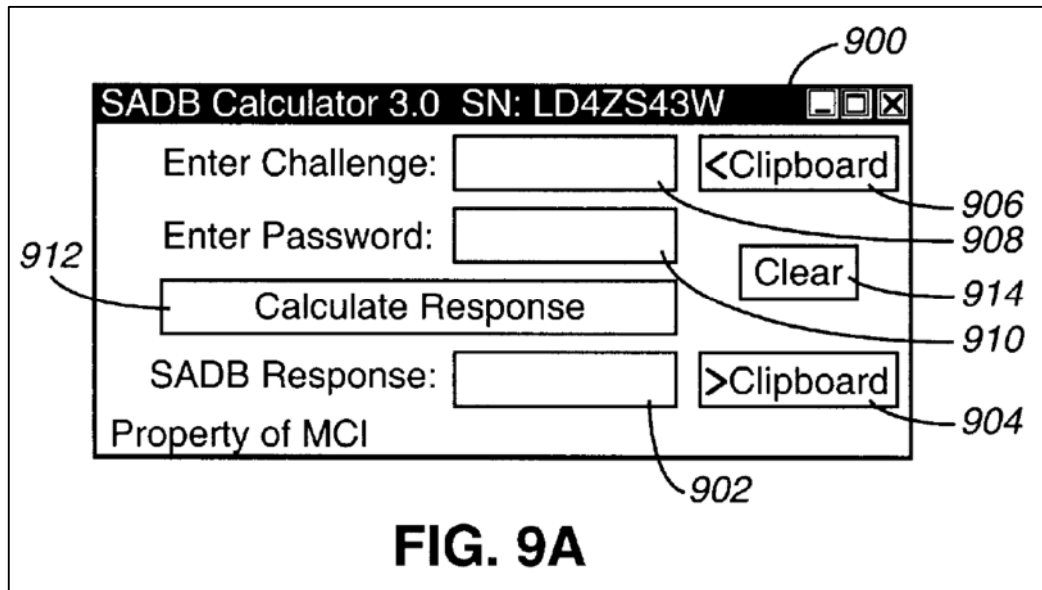
Petitioners contend that the combination of *Kato* and *Guthrie* renders obvious claims 1-3 and 5-7 of the '658 Patent. Pet. at 1, 55-93. That combination does not render obvious claims 1-3 and 5-7 of the '658 Patent for at least the following reasons.

Guthrie pertains to “electronic access systems in computers.” Ex. 1007 at 1:8-9. In *Guthrie*, the user uses a client computer (102) to authenticate with an authentication server (104). *See id.* at 4:13-27.



Id. at Fig. 1A. More specifically, the client computer and the authentication server both run applications that contain a “calculator” that is used for the authentication process—both applications calculate the “response value,” based on several inputs, and the server determines whether the “response value” received from the client computer matches the “response value” calculated by the server. *See id.* at 4:13-27.

Guthrie specifies a client computer because its authentication process requires the user interface and computing power of a computer. Figure 9A, reproduced below, depicts the user interface of the “SADB calculator” application running on a client computer:



Id. at Fig. 9A; *see also id.* at 12:43-45.

The SADB calculator uses a serial number, SADB password, and challenge as input to the SHA 128 hash algorithm, which is a cryptographic function. *See id.* 6:10-27, Fig. 3. The user interface (including the ability to copy values to and from the clipboard) is necessitated by the length of the various inputs and the response. *See id.* at Fig. 3. *Guthrie* specifies that the client computer is a DOS, UNIX, or Macintosh computer due to the requirements of providing a user interface and the processing requirements necessary to generate the response using the SHA 128 hash

algorithm. *See id.* at 12:43-53. Similarly, although the authentication server does not require a user interface, it requires a at least “a DOS-based personal computer (PC),” if not “a high-grade, mid-range computer.” *See id.* at 4:50-57. All of the communications between the client computer and server take place over the same network, unlike the claims of the ’658 Patent. *See, e.g., id.* at 4:65-5:1 (“Messages and other data are exchanged between the client 102 and the server 104 via the network 100. The network 100 may be a public switched telephone network (PSTN), such as in a dial-in or other access configuration.”).

Kato takes a very different approach from *Guthrie*. *Kato* discloses “an authentication system and an authentication device that permits the provision of a local area network (LAN) only to proper users.” Ex. 1005 at ¶ 1. In contrast to *Guthrie*, *Kato* is simply about transmitting user authentication information (e.g., username or password) to a user. In *Kato*, the user requests a temporary password by placing a call from a phone terminal to an authentication device. *Id.* at ¶ 16 (“[T]he user places a call (TEL) from the user PHS terminal 1 to the authentication device 3 (step 13).”), ¶ 18 (“[T]he authentication device 3 issues a ‘temporary password’ to the user PHS terminal 1 and notifies the user PHS terminal 1 of the character message (step 17).”). Rather than use a computer like *Guthrie*, *Kato* uses a “commercially available simplified mobile telephone having a user-password request/notification function.” *Id.* at ¶ 14. *Kato* does not require the computing

power of *Guthrie*'s client computer because it does not perform hashing algorithms on multiple inputs to generate a response. *Id.* at ¶¶ 18–19 (disclosing that the user inputs the same password that was previously sent to the user by the authentication device: “Continuing, the authentication device 3 issues a ‘temporary password’ to the user PHS terminal 1 and notifies the user PHS terminal 1 of the character message (step 17). . . . It is assumed that the temporary password is, for example, VWXYZ. The user PHS terminal 1 is notified of the above-mentioned temporary password VWXYZ (step 18), and the user issues a network-connection request to the remote-connection device 4 (step 19). . . . In this situation, the ID obtained in step 11 is used as the ID, and the ‘temporary password’ obtained in step 18 is used as the password.”). That *Kato* uses a mobile telephone is also contrary to *Guthrie*'s express teaching away from using battery powered devices, like a mobile telephone. *See* Ex. 1007 at 1:61-63 (“Furthermore, the card requires a battery to energize its internal circuitry. Therefore, the card has a limited life, after which a new battery must be inserted.”). That *Kato* transmits passwords via a text message also violates a central tenet of *Guthrie*, that “the user’s authentication password is never transmitted over the network where it could be exposed or compromised.” *Id.* at 4:23-27 (emphasis added).

Despite those incompatibilities in the art, the Petition argues that it would have been obvious to combine *Kato* and *Guthrie* to arrive at the claimed inventions of the

'658 Patent. The applicable term for Petitioners obviousness argument is “impermissible hindsight,” which is improper.

1. It Would Not Have Been Obvious To Combine *Kato* And *Guthrie*

The Petition identifies a single reason (presented in two parts) for why it would have been obvious to combine *Kato* and *Guthrie*, by replacing the client computer of *Guthrie* with the “simplified, mobile-telephone terminal” of *Kato*:

- “(1) preserving *Kato*’s architecture, which adds security by transmitting a token to a different, known device of the user than the device that will access the secured system”; while
- “(2) benefitting from *Guthrie*’s challenge-response process that uses three separate codes such that exposing one or two of the codes during transmission would still prevent unauthorized access.”

Pet., pp. 59-60.

The Petition argues that “[a] POSITA would have been motivated to incorporate *Guthrie*’s challenge-response process into *Kato* to enhance *Kato*’s security by preventing the user’s secret password from being exposed during transmission.” *Id.* at 59. The Petition continues that “[a] POSITA would have been motivated to incorporate *Guthrie*’s challenge-response process into *Kato*, in place of *Kato*’s temporary password, to further enhance *Kato*’s security by only transmitting

the challenge and not the user's secret password, preventing exposure of the password, and by requiring the user's secret password in addition to the challenge to obtain the response.” *Id.* at 61. But *Kato* does not contemplate that data such as the temporary password might be intercepted while being transmitted to the mobile device—in fact, *Kato* boasts that its authentication system provides “extremely strong security” and that it would be “extremely difficult for a third party to improperly use the network service.” Ex. 1005 at ¶ 22. Accordingly, a POSITA would not be motivated to incorporate *Guthrie* or any other reference into *Kato* to improve the *Kato* system's security. Additionally, *Guthrie* already does not transmit the user's password. See Ex. 1007 at 4:23-27, 6:10-27, Fig. 3. So combining *Kato* with *Guthrie* does not address any alleged deficiency in *Guthrie*. And *Guthrie* expressly teaches away from using battery powered devices, like the mobile-telephone terminal of *Kato*. See Ex. 1007 at 1:61-63 (“Furthermore, the card requires a battery to energize its internal circuitry. Therefore, the card has a limited life, after which a new battery must be inserted.”). The declaration of Dr. Reiher should be afforded no weight for this argument because the declaration does nothing more restate Petitioners' argument without any additional supporting evidence or reasoning. Compare Pet. pp. 60-62 with Ex. 1002 ¶¶ 148–49 (Reiher declaration); *Xerox Corp., et al. v. Bytemark, Inc.*, No. IPR2022-00624, Paper 9, pp. 15-16 (P.T.A.B. Aug. 24, 2022) (Precedential) (denying IPR institution – holding

declaration is entitled to little weight when it contains an exact restatement of the petition's arguments without any additional supporting evidence or reasoning).

The Petition argues that a POSITA would have had a reasonable expectation of success in implementing Guthrie's challenge-response process using the mobile device ("PHS terminal") of *Kato* by either (1) having the PHS terminal receive the challenge, but implementing Guthrie's SADB calculator on Guthrie's client after the user manually enters the received challenge on the client; or (2) having PHS terminal implement Guthrie's SADB calculator and then having the user enter the resulting response on Guthrie's client. Pet., pp. 62-65. A POSITA would not have had a reasonable expectation of success with the first implementation because *Guthrie* expressly teaches away from using battery powered devices, like a mobile device. See Ex. 1007 at 1:61-63 ("Furthermore, the card requires a battery to energize its internal circuitry. Therefore, the card has a limited life, after which a new battery must be inserted.").

A POSITA would not have had a reasonable expectation of success of the second implementation—having *Kato*'s PHS terminal implement *Guthrie*'s SADB calculator. The crux of Petitioners' argument is that in the 1997/1998 timeframe mobile phones and pagers (i.e., *Kato*'s "PHS terminal") had the equivalent processing power of a personal computer (i.e., *Guthrie*'s "client computer"), without any supporting evidence. Petitioners argue that "Guthrie's response calculators can

be implemented as software on various software and hardware platforms, including a ‘palm top computer’ (akin to Kato’s PHS terminal).” Pet., pp. 62-63 (citing Ex. 1007 at Abstract, 3:59-63, 4:8-13, 5:18-22, 5:48-6:9, 12:43-53, 13:16-20). But the only computers identified are personal computers: “The user 114 may use more than one client computer 102 to access the server 104 (e.g., via a home computer, office computer, lap top computer, palm top computer, etc.” Ex. 1007 at 6:1-9. And the operating systems identified for providing the user interface for the SADB calculator are personal-computer operating systems (DOS, UNIX, Macintosh), not mobile phone/operating systems. *Id.* at 12:43-53. Petitioners attempt to rewrite *Kato* by arguing that “Kato’s PHS terminal is a mobile device like a personal digital assistant (‘PDA’) and personal mobile computer (a ‘palm top computer’),” without any citations to *Kato* itself. See Pet., p. 64. That is because *Kato* describes the “PHS terminal” only as a “commercially available simplified mobile telephone terminal,” without any reference to PDAs or palm top computers. See Ex. 1005 at ¶¶ 12, 14 (emphasis added).

Petitioners rely on the *Falk* reference to argue that “[i]t was known that devices like Kato’s PHS terminal can perform encryption algorithms.” Pet., pp. 64-65 (citing Ex. 1015 at 3:4-20, 4:19-45). But *Falk* does not support Petitioners’ argument because it does not describe any “hash algorithms” (the word “hash” does not appear anywhere in the reference), let alone the SHA 128 algorithm used in

Guthrie. See Ex. 1015 at 3:4-20, 4:19-45. Moreover, *Falk* describes itself as “a modified pager,” which contradicts Petitioners’ argument that a standard pager or mobile phone could implement *Guthrie*’s SADB calculator. See *id.* at Abstract. Petitioners also cite *Turtiainen* for the same argument, see Ex. 1021 at 10:22-36, but that reference also does not describe any sort of “hash algorithm.” And the *Shields* reference is not relevant because Petitioners concede that it is a PDA, not a “PHS terminal,” as disclosed in *Kato*. See Pet., p. 64. Moreover, Petitioners do not cite any evidence that the “PHS terminal” of *Kato* could provide the graphical user interface required for the SADB calculator. See Pet., pp. 64-65. Here, the declaration of Dr. Reiher should be afforded no weight for this argument because the declaration does nothing more restate Petitioners’ argument without any additional supporting evidence or reasoning. Compare Pet. p. 15 with Ex. 1002 ¶70 (Reiher declaration); *Xerox Corp., et al. v. Bytemark, Inc.*, No. IPR2022-00624, Paper 9, pp. 15-16 (P.T.A.B. Aug. 24, 2022) (Precedential) (denying IPR institution – holding declaration is entitled to little weight when it contains an exact restatement of the petition’s arguments without any additional supporting evidence or reasoning). Accordingly, Petitioners’ argument is baseless.

2. Independent Claim 1

The combination of *Kato* and *Guthrie* does not render obvious independent claim 1 because the combination does not teach or suggest the following elements of the claim.

- i. 1[a] “associating the user with a personal communication device . . . wherein said second network is a cell phone network different from the first computer network”

Claim element 1[a] recites “associating the user with a personal communication device . . . wherein said second network is a cell phone network different from the first computer network.” Petitioners argue that this limitation is met by *Kato*’s PHS terminal, as combined in the Petition. *See* Pet., pp. 70-71. But it would not have been obvious to combine *Kato*’s PHS terminal with *Guthrie* for the reasons identified above in Section III.E.1. Accordingly, the combination of *Kato* and *Guthrie* does not teach or suggest claim element 1[a].

- ii. 1[b] “receiving a request from a user for a token via the personal communication device, over the second network”

Claim element 1[b] recites “receiving a request from a user for a token via the personal communication device” Petitioners argue that this limitation is met by *Kato*’s PHS terminal, as combined in the Petition. *See* Pet., pp. 72-74. But it would not have been obvious to combine *Kato*’s PHS terminal with *Guthrie* for the reasons identified above in Section III.E.1. Accordingly, the combination of *Kato* and *Guthrie* does not teach or suggest claim element 1[b].

- iii. 1[f] “transmitting the token to the personal communication device”

Claim element 1[f] recites “transmitting the token to the personal communication device.” Petitioners argue that this limitation is met by *Kato*’s PHS terminal, as combined in the Petition. *See* Pet., pp. 81-83. But it would not have been obvious to combine *Kato*’s PHS terminal with *Guthrie* for the reasons identified above in Section III.E.1. Accordingly, the combination of *Kato* and *Guthrie* does not teach or suggest claim element 1[f].

3. Dependent Claims 2 and 3

Dependent claims 2 and 3 depend from and add limitations to independent claim 1. The combination of *Kato* and *Guthrie* fails to render obvious claim 1 unpatentable, therefore, the combination of *Kato* and *Guthrie* fails to render obvious dependent claims 2 and 3 for at least the same reasons.

4. Independent Claim 5

The combination of *Kato* and *Guthrie* does not render obvious independent claim 5 because the combination does not teach or suggest the following elements of the claim.

- i. 5[b] “a user database configured to associate a user with a personal communication device possessed by the user . . .”

Claim element 5[b] recites “a user database configured to associate a user with a personal communication device possessed by the user, said personal

communication device configured to communicate over a cell phone network with the user authentication system.” Petitioners argue that this limitation is met by *Kato*’s PHS terminal, as combined in the Petition. *See* Pet., pp. 89-90. But it would not have been obvious to combine *Kato*’s PHS terminal with *Guthrie* for the reasons identified above in Section III.E.1. Accordingly, the combination of *Kato* and *Guthrie* does not teach or suggest claim element 5[b].

- ii. 5[e] “a communication module configured to transmit the token to the personal communication device through the cell phone network”

Claim element 5[e] recites “a communication module configured to transmit the token to the personal communication device through the cell phone network.” Petitioners argue that this limitation is met by *Kato*’s PHS terminal, as combined in the Petition. *See* Pet., p. 91. But it would not have been obvious to combine *Kato*’s PHS terminal with *Guthrie* for the reasons identified above in Section III.E.1. Accordingly, the combination of *Kato* and *Guthrie* does not teach or suggest claim element 5[e].

5. Dependent Claims 6 and 7

Dependent claim 6 depends from and adds limitations to independent claim 1, and dependent claim 7 depends from and adds limitations to dependent claim 6. The combination of *Kato* and *Guthrie* fails to render obvious claim 1 unpatentable,

therefore, the combination of *Kato* and *Guthrie* fails to render obvious dependent claims 6 and 7 for at least the same reasons.

IV. THE PETITION SHOULD BE DENIED BECAUSE THE BOARD DOES NOT HAVE JURISDICTION OVER EXPIRED PATENTS.

In *Oil States*, the Supreme Court explained that the “decision to *grant* a patent is a matter involving public rights—specifically, the grant of a public franchise.” *Oil States Energy Servs., LLC v. Greene’s Energy Grp., LLC*, 138 S. Ct. 1365, 1373 (2018). “Specifically, patents are public franchises that the Government grants to the inventors of new and useful improvements.” *Id.* (internal quotation marks omitted). The Court explained that “Congress [has] significant latitude to assign [the] adjudication of public rights to entities other than Article III courts.” *Id.* at 1368. In exercising its “significant latitude,” Congress grants public franchises “subject to the qualification that the PTO has the authority to reexamine—and perhaps cancel—a patent claim in an inter partes review.” *Id.* at 1368, 1374 (internal quotation marks omitted). Accordingly, so long as the public franchise exists, the Patent Office may have jurisdiction to amend and cancel the claims of the patent (e.g., via *inter partes* review).

When a patent expires, however, the public franchise ceases to exist and the franchisee (e.g., the patent owner) no longer has the right to exclude others. At most, the franchisee may be entitled to collect damages from the public franchise that

formerly existed through an infringement action in district court. But because the public franchise no longer exists, the Patent Office has nothing in its authority to cancel or amend. Expiration removes the patent from the Patent Office's jurisdiction and returns it to the sole jurisdiction of the Article III courts, which have exclusive authority to govern claims for damages. If this were not so, the Patent Office would purport to have authority to retroactively modify a public franchise that no longer exists, in a setting where the expired public franchise does not enjoy any presumption of validity and in which amendment of claims is no longer permitted.

The '658 Patent issued in January 2006, long before the Petition was filed on January 3, 2023. With the expiration of the '658 Patent in March 2020, the Board ceased to have jurisdiction over the '658 Patent, and this *inter partes* review proceeding should be terminated as a result.

V. CONCLUSION

The Petition should be denied. Petitioner has not established that the cited references render unpatentable any challenged claim of the '658 Patent. Alternatively, the Board should deny institution because it does not have jurisdiction over expired patents.

CERTIFICATE OF COMPLIANCE

Pursuant to 37 C.F.R. § 42.24(d), I hereby certify that the foregoing Patent Owner's Preliminary Response contains 8,485 words as measured by the word processing software used to prepare the document, excluding the cover page, signature block, and portions exempted under 37 C.F.R. § 42.24(a) or (b).

DATED: April 27, 2023

Respectfully submitted,

By: /John Wittenzellner/
John Wittenzellner
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Counsel for Patent Owner

CERTIFICATE OF SERVICE

Pursuant to 37 C.F.R. § 42.6, the undersigned certifies that on April 27, 2023, the foregoing document was served on counsel of record for Petitioner by filing this document through the End-to-End System, as well as via electronic mail to counsel of record for Petitioner at the following addresses: Lionel M. Lavenue (lionel.lavenue@finnegan.com); Kara A. Specht (kara.specht@finnegan.com); Cory C. Bell (cory.bell@finnegan.com); Xirui Zhang (xirui.zhang@finnegan.com).

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