

UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE PATENT TRIAL AND APPEAL BOARD

TRUIST BANK,

Petitioner,

v.

UNITED SERVICES AUTOMOBILE ASSOCIATION,

Patent Owner.

U.S. Patent No. 11,544,944

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Case No. IPR2023-00829

DECLARATION OF DR. DAVID DOERMANN

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8.	[14g] using a wireless cellular network, transmitting a copy of the photos over the Internet from the customer's handheld mobile device and submitting the check for mobile check deposit in the bank after the photos of the check are presented to the customer;	96
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2.	[17a] a bank computer programmed to update a balance of an account to reflect an amount of a check submitted for mobile check deposit by the customer's handheld mobile device, the customer's handheld mobile device including a downloaded app, the downloaded app associated with a bank and causing the customer's handheld mobile device to perform:	100
3.	[17b] receiving input entered by the customer indicating an amount of the check;	100
4.	[17c] using a display of the customer's handheld mobile device to assist the customer in having a digital camera take a photo of the check, ...	100
5.	[17d] assisting the customer as to an orientation for taking the photo, and.....	100

6.	[17e] after taking the photo, using a wireless network, transmitting a copy of the photo over the Internet from the customer's handheld mobile device and submitting the check for mobile check deposit in the bank; and.....	101
7.	[17f] the system being configured to update the balance of the account after optical character recognition reads a Magnetic Ink Character Recognition (MICR) line of the check in the photo.	101
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I. INTRODUCTION

1. I, Dr. David Doermann, submit this declaration to state my opinions on the matters described below.

2. I have been retained on behalf of Truist Bank (“Truist”) as an independent expert for the above-identified *inter partes* review proceeding involving U.S. Patent No. 11,544,944 (“the ’944 Patent”). Although I am being compensated for my time in connection with this IPR at my standard hourly consulting rate and reimbursed for reasonable out-of-pocket expenses, no part of my compensation depends on the outcome of this proceeding, and I have no other interest in this proceeding.

3. I have been asked to provide my technical review, analysis, insights, and opinions regarding the ’944 Patent and the above-noted references that form the basis for the invalidity grounds set forth in the Petition for *Inter Partes* Review of the ’944 Patent.

II. QUALIFICATIONS

4. I believe that I am well qualified to serve as a technical expert in this matter based upon my educational and work experience.

5. I am currently a Professor of Empire Innovation in the Department of Computer Science and Engineering at the University at Buffalo. I am also the inaugural director of the University at Buffalo Institute for Artificial Intelligence

and Data Science. I received my B.Sc. degree in Computer Science and Mathematics from the Bloomsburg University of Pennsylvania in 1987, and I received my M.Sc. degree in computer science from the University of Maryland College Park, Maryland, in 1989. I continued my studies in the Computer Vision Laboratory at the University of Maryland, where I earned a Ph.D. degree in Computer Science in 1993. My Ph.D. thesis focused on applying image processing and computer vision techniques to the detailed understanding of document images.

6. In April 1993, I began working as a research scientist at the University of Maryland's Institute for Advanced Computer Studies (UMIACS). In the same year, I became the Director of the Laboratory for Language and Media Processing (LAMP) in UMIACS. I was an assistant research scientist from 1993 to 2000 and an associate research scientist from 2000 to 2008 before becoming a senior research scientist in 2009.

7. While on the University of Maryland faculty, I was the principal investigator or co-principal investigator for numerous research projects and received millions of dollars of funding from government agencies, private companies, and academic institutions. My research's focus was widely related to computer vision, pattern recognition, and human language technologies. In document image analysis, my projects have included page decomposition, structural analysis and classification page segmentation, logo recognition,

document image compression, duplicate detection, image-based retrieval, optical character recognition (“OCR”), and signature verification, among others. In video processing, my projects centered on the segmentation of compressed videos, structural representation classification of videos, detection of reformatted video segments, and the performance evaluation of automated video analysis algorithms. I have focused extensively on vision algorithms and techniques for operating on embedded mobile devices, such as camera phones, cameras, and edge computing devices in both areas.

8. In 2014, I was hired as a Program Manager in the Information Innovation Office at the Defense Advanced Research Projects Agency (DARPA). In my role, I developed, selected, funded, and oversaw research and transition funding in the areas of computer vision, human language technologies, and voice analytics. I developed and ran the successful Media Forensics program, which sought to detect, characterize, and uncover the provenance of modified images and videos, including documents and media collected with mobile devices.

9. Over the past decade, my research has expanded to include the general field of artificial intelligence, applied primarily to computer vision. I have published extensively on image quality estimation, text detection in the wild, applications of machine learning to front-end and edge computing, and cutting-edge applications in evolutionary computing.

10. In 2005, I co-founded and served as the President of Applied Media Analysis Inc., a company specializing in image processing and computer vision technologies on mobile devices and in multilingual/multimodal data annotation necessary for training systems to operate on these devices. I have also served as a technical consultant in document image understanding, document image retrieval, image processing, and system integration for government agencies and private companies. Our company was one of the early collaborators with Nokia on using their low-resolution camera phones for capturing and analyzing document images.

11. As a member of the graduate faculty at both the University of Maryland and the University at Buffalo, I have co-supervised approximately 20 Ph.D. theses and mentored over 40 Master's degree students and countless undergraduate students on research topics related to my fields of study. I have taught computer vision, document analysis, artificial intelligence, and edge computing courses. I have also developed and taught a short course for the Society of Photo-Optical Instrumentation Engineers (SPIE) on document image analysis and computer vision on Android devices.

12. I am a founding editor of the International Journal of Document Analysis and Recognition (IJDAR). I have served as the general chair or co-chair at several international conferences. I was the general chair of the field's premier conference, the International Conference on Document Analysis and Recognition

which was held in Washington DC in 2013, and I will be the general chair of the conference when it is held in San Jose in 2023.

13. I have over 62 refereed journal publications and over 225 refereed conference papers. In 2002, I received an honorary doctorate of technology sciences from the University of Oulu in Finland for my contributions to digital media processing and document image analysis research. I am a Fellow of the Institute of Electrical and Electronics Engineers (IEEE) and the International Association of Pattern Recognition (IAPR).

III. MATERIALS CONSIDERED

In forming my opinions, I have reviewed the following documents and any other documents cited in this declaration:

Exhibit	Description
Ex. 1001	U.S. Patent No. 11,544,944 (“the ’944 patent”)
Ex. 1002	Prosecution File History of U.S. Patent No. 11,544,944
Ex. 1005	International Patent Publication No. WO 2005/043857 (“Garcia”)
Ex. 1006	U.S. Patent No. 7,792,753 (“Slater”)
Ex. 1007	U.S. Patent No. 7,027,171 (“Watanabe”)
Ex. 1008	U.S. Patent Publication No. 2006/0106717 (“Randle”)
Ex. 1009	U.S. Patent Publication No. 2006/0026140 (“King”)
Ex. 1010	U.S. Patent Publication No. 2006/0152576 (“Kiessling”)
Ex. 1011	ANS X.100-160-1-2004, Part 1: Placement and Location of Magnetic Ink Printing (MICR), American National Standard for Financial Services (Approved Oct. 15, 2004)
Ex. 1012	U.S. Patent Publication No. 2006/0164682 (“Lev”)

Ex. 1013	Reed, John, FT.com site: Mobile users branch out, FT.com, <i>available at</i> https://www.proquest.com/pqrl/printviewfile?accountid=35635 (Oct. 6, 2005)
Ex. 1014	U.S. Patent Application Publication 2005/0097046 (“Singfield”)
Ex. 1015	U.S. Patent No. 5,664,027 (“Ittner”)
Ex. 1016	<i>PNC Bank N.A. v. United Servs. Auto. Ass’n</i> , IPR2021-01077, Paper 73 (PTAB Jan. 20, 2023)
Ex. 1017	U.S. Reissued Patent No. RE44,274 (“Popadic”)
Ex. 1018	U.S. Patent Application Publication No. 2005/0267843 (“Acharya”)
Ex. 1019	“Reserve Banks to Adopt DSTU X9.37-2003 Format for Check 21 Image Services,” Fed. Reserve Bank of Minneapolis Fin. Serv. Policy Comm., May 18, 2004 (retrieved from https://web.archive.org/web/20040609221704/http://www.frbservices.org/Retail/pdf/PRFormatForCheck21ImageSvcs.pdf)
Ex. 1020	U.S. Patent Application Publication No. 2005/0190269 (“Grignani”)
Ex. 1021	US Patent Publication No. 2005/0281448 (“Lugg”)
Ex. 1022	U.S. Patent No. 6,181,837 (“Cahill”)
Ex. 1023	U.S. Patent Publication No. 2006/0112013 (“Maloney”)
Ex. 1025	“Camera Phone Shoot-Out,” Phone Scoop, Dec. 18, 2002 (retrieved from https://www.phonescoop.com/articles/article.php?a=12)

IV. RELEVANT LEGAL STANDARDS

14. In preparing this declaration and forming my opinions, I am relying on certain legal principles that counsel explained to me. My understanding of these concepts is summarized below.

15. I have been asked to provide my opinions regarding whether claims 1-14 (“the Challenged Claims”) of the ’944 Patent are unpatentable, either because they are anticipated or would have been obvious to a person having ordinary skill in the art at the time of the alleged invention, in light of the prior art. I have been

advised and understand that prior art includes all analogous art, and that two separate tests define the scope of analogous prior art: (1) whether the art is from the same field of endeavor, regardless of the problem addressed and, (2) if the reference is not within the field of the inventor's endeavor, whether the reference still is reasonably pertinent to the particular problem with which the inventor is involved. It is my opinion that the Challenged Claims would have been anticipated or obvious to a person having ordinary skill in the art at the time of the '944 Patent invention.

16. In forming my opinions expressed below, in addition to my knowledge and experience based upon my work in the fields of image processing, computer vision, and document imaging and analysis using mobile devices as described below, I have considered the documents listed in the Table in Section III above.

17. I have been advised and understand that a dependent claim is a patent claim that refers back to another patent claim. I have been informed and understand that a dependent claim includes all of the limitations of the claim to which it refers.

18. I have been advised and understand that there are two ways in which prior art may render a patent claim unpatentable. First, the prior art can "anticipate" the claim. Second, the prior art can make the claim "obvious" to a

person of ordinary skill in the art. I understand that for an invention claimed in a patent to be patentable, it must not be anticipated and must not be obvious based on what was known before the invention was made.

19. I have been advised and understand that a patent claim is unpatentable as anticipated under 35 U.S.C. § 102 if each element of that claim is present either explicitly or inherently in a single prior art reference. I have also been advised and understand that, to be an inherent disclosure, the prior art reference must necessarily disclose the limitation. The fact that the reference might practice or contain a claimed limitation is insufficient to establish that the reference inherently teaches the limitation.

20. I have been advised and understand that a claimed invention is unpatentable under 35 U.S.C. § 103 if the differences between the claimed subject matter and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which the subject matter pertains. I have also been advised and understand that the obviousness analysis takes into account factual inquiries, including the level of ordinary skill in the art, the scope and content of the prior art, and the differences between the prior art and the claimed subject matter.

21. I have further been advised and understand that the Supreme Court has recognized several rationales for combining references or modifying a

reference to show obviousness of claimed subject matter. Some of these rationales include the following: (a) combining prior art elements according to known methods to yield predictable results; (b) simple substitution of one known element for another to obtain predictable results; (c) use of a known technique to improve a similar device (method, or product) in the same way; (d) applying a known technique to a known device (method, or product) ready for improvement to yield predictable results; (e) choosing from a finite number of identified, predictable solutions, with a reasonable expectation of success; and (f) some teaching, suggestion, or motivation in the prior art that would have led one of ordinary skill to modify the prior art reference or to combine prior art reference teachings to arrive at the claimed invention.

22. When considering the issue of obviousness, I have been advised and understand that I should consider (1) the scope and content of the prior art; (2) the differences between the prior art and the claims at issue; (3) the level of ordinary skill in the art; and (4) evidence of secondary indicia of nonobviousness. I have been informed that secondary indicia of nonobviousness include (i) “long-felt need” for the claimed invention, (ii) commercial success attributable to the claimed invention, (iii) unexpected results of the claimed invention, and (iv) “copying” of the claimed invention by others.

A. Level of Ordinary Skill in the Art

23. In rendering the opinions set forth in this declaration, I have been asked to consider the '944 Patent's claims and the prior art through the eyes of a person of ordinary skill in the art. I understand that a person of ordinary skill in the art is determined by considering (1) the type of problems encountered in the art, (2) prior art solutions to those problems, (3) the rapidity with which innovations are made, (4) the sophistication of the technology, and (5) the educational level and years of experience level of those working in the pertinent field.

24. I understand that I must evaluate the '944 Patent from the perspective of a person of ordinary skill in the art. That is, the '944 Patent must be evaluated through the eyes of a person with ordinary skill in the relevant art at the time of the invention of this patent. It is my opinion that such a person of ordinary skill in the art as related to the '944 Patent would have either: (1) a Bachelor of Science degree in Electrical Engineering, Computer Engineering, Computer Science, or an equivalent field, with at least two years of academic or industry experience in financial technology, including image processing; or (2) a Master of Science degree in Electrical Engineering, Computer Engineering, Computer Science, or an equivalent field, with at least a year of academic or industry experience in the same field. Higher levels of education may offset less experience and extensive experience can substitute for formal education.

25. Based on my educational background and experience, such as my experience with document image analysis and image processing and computer vision technologies on mobile devices (*see* paragraphs 4-13), I am qualified as at least a person of ordinary skill in the art with respect to the '944 Patent. Thus, I am familiar with the knowledge of the person of ordinary skill in the art at the time of the '944 Patent invention. I am able to opine on how a person of ordinary skill in the art would have understood the disclosure and claims of the '944 Patent, the disclosures of the prior art, the motivation to combine the prior art, and what combinations would have been obvious and not have been obvious to one of ordinary skill in the art.

B. Claim Construction

26. I have been informed that in an *inter partes* review proceeding, claim terms should be construed under the same standard applied in federal district court cases. Under this standard, I have been informed that claim terms are generally given their ordinary and customary meaning as understood by one of ordinary skill in the art in light of the specification and the prosecution history pertaining to the patent. I understand, however, that claim terms are generally not limited by the embodiments described in the specification.

27. I understand that in addition to the claims, specification, and prosecution history, other evidence may be considered to ascertain the meaning of

claim terms, including textbooks, encyclopedias, articles, and dictionaries. I have been informed that this additional evidence is often less significant and less reliable than the claims, specification, and prosecution history.

28. I have also been informed that claims should only be construed to the extent necessary to resolve any controversy.

29. Based on my review of these materials and my personal knowledge and experience, I have considered the plain and ordinary meaning of each term of the '944 Patent as it would have been understood by one skilled in the art at the time of the '944 Patent invention. I apply the plain and ordinary meaning of each claim term throughout this declaration.

V. THE CHALLENGED CLAIMS ARE UNPATENTABLE

A. THE '944 PATENT

30. The '944 patent claims processing a check deposit based on an image of the check transmitted from a remote user device. But such check processing was already well-known before the priority date, October 31, 2006.

31. Claim 1 is directed to a system for a remote check deposit comprising a customer's handheld mobile device and a bank computer connected to the customer's handheld mobile device via a network. Ex. 1001, Claim 1. Claim 1 predictably recites that the handheld mobile device includes a downloaded app associated with a bank, which a customer uses to input a check amount, and it also

assists a customer in selecting an orientation for taking the photo, taking the photo and transmitting the photo to a bank over the Internet. *Id.* The bank computer in the system is programmed to check for errors in the check using optical character recognition (“OCR”) to determine the amount of the check, which is compared with the customer-entered amount. *Id.* If no errors are found in the photo of the check, the system updates a balance of an account. *Id.* As further explained below, these were routine and conventional features well-known in the art and reflected nothing inventive.

32. Indeed, I understand that in another IPR proceeding, IPR2021-01077, the Board found all claims of a related patent, U.S. Patent No. 10,621,559, based on the same references—Garcia, Slater, Watanabe, and Randle—asserted in the petition and analyzed in my declaration.

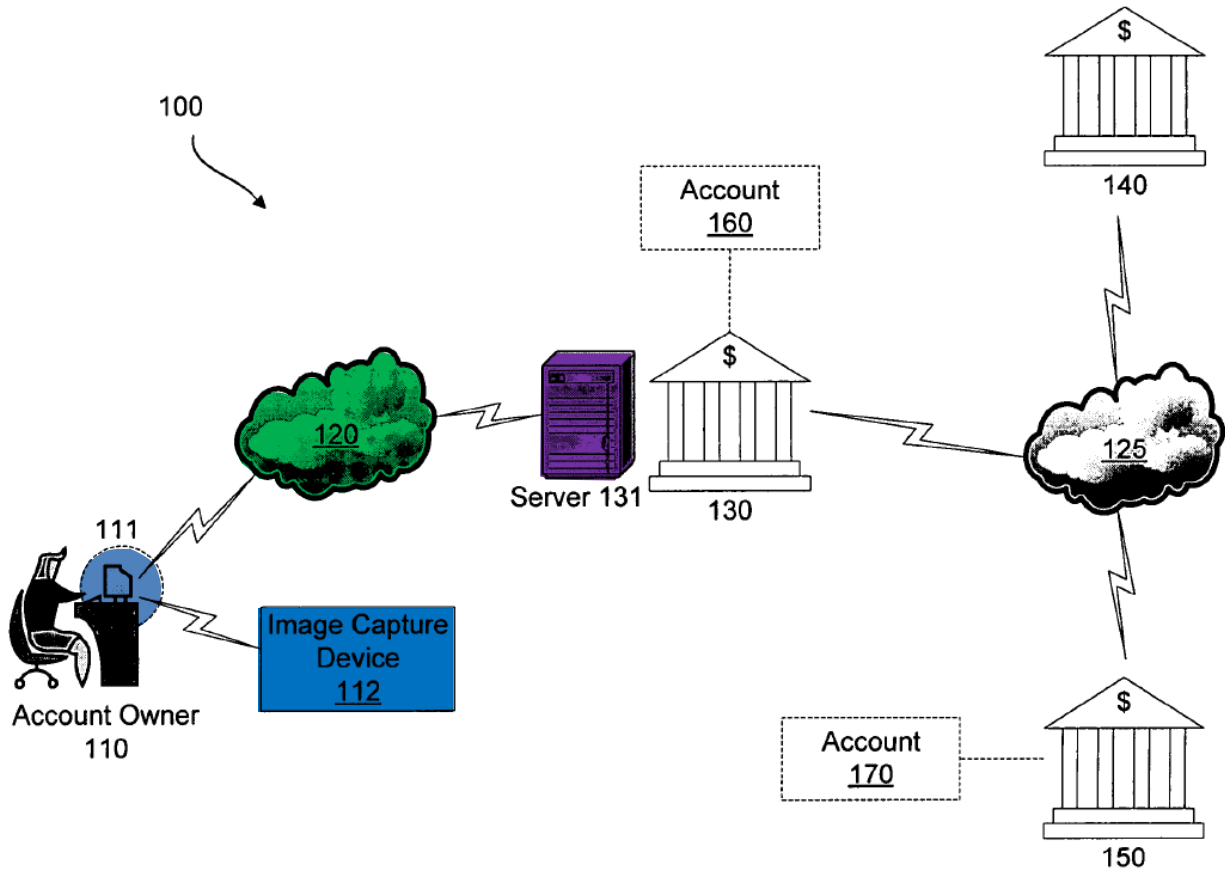
33. I understand that the invalidated claims of the ’559 patent and the claims of the ’994 patent have numerous common elements. Thus, it is my opinion that the same references should render the ’944 patent claims unpatentable as well.

34. Any additional elements found in the ’944 patent claims, such as a “downloaded app,” are trivial elements that were routine, conventional, and well-known in the art, and thus, do not confer any patentability to the claims, as I further explain below.

1. Overview of the '944 Patent

35. The '944 patent family starts about two years after The Check Clearing for the 21st Century Act ("Check 21") went into effect. Ex. 1011, 1. The '944 patent relates to processing such check images when received by a customer's remote image capture device. Ex. 1001, 2:51-54. The remote capture device may display instructions to a customer to ensure that the captured image meets certain criteria. *Id.*, 2:54-3:3.

36. In the disclosed system, an account owner 110 uses a "general purpose computer 111" (e.g., a PC) having an "image capture device 112" (e.g., a scanner or digital camera). *Id.*, 3:59-60, 4:10-27. And a financial institution 130 has a server 131 for "communicating with customers" over a communication network 120 (e.g., the Internet), *id.*, 3:61-4:1, 7:19-21, and for communicating with other financial institutions via network 125, *id.*, 4:6-9.

**FIGURE 1**

Ex. 1001, FIG. 1 (annotated with color).

37. The patent discloses that the **remote capture device** may include computer software with a functional subsystem for providing instructions to a customer on how to capture an image of a check. *Id.*, 14:1-13. The captured image is then sent to the **server**. *Id.*, 9:33-43. The **server** checks for errors in the check by performing optical character recognition on the check amount and comparing it to the customer-entered amount (*id.*, 11:43-55), detecting duplicate check deposit (*id.*, 11:19-23), and confirming that a mark or signature is present in an endorsement

location in the image of the back of the check (*id.*, 12:30-40). Also, the patent discloses converting the photo into a bi-tonal Tag Image File Format (TIFF) consistent with the requirements of Check 21 regulation. *Id.*, 12:41-50.

B. Grounds of Unpatentability

38. Based on my review of the materials set forth above, including my application of the knowledge of a person of ordinary skill in the art, it is my opinion that claims 1-20 of the '944 Patent are rendered obvious to one of ordinary skill in the art.

39. In particular, it is my opinion that claims 1-20 of the '944 Patent are either anticipated or would have been rendered obvious to one of ordinary skill in the art, based on the grounds shown below:

Ground 1a	Garcia in view of King and Slater renders obvious claims 1,5, 7-9
Ground 1b	Garcia in view of King, Watanabe, and Slater renders obvious claims 1, 5, 7-9
Ground 2a	Garcia in view of King, Slater, and Randle renders obvious claims 2-4, 6, 10-14, 16-17, and 19-20
Ground 2b	Garcia in view of King, Watanabe, Slater, and Randle renders obvious claims 2-4, 6, 10-14, 16-17, and 19-20
Ground 3a	Kiessling in view of Randle and King renders obvious claims 14-20
Ground 3b	Kiessling in view of Randle, King, and Watanabe renders obvious claims 14-20

VI. GROUNDS 1a AND 1b: CLAIMS 1, 5, AND 7-9 ARE UNPATENTABLE OVER GARCIA IN VIEW OF KING, [WATANABE (1B)], AND SLATER

A. Overview of the Combination

40. In my opinion Garcia, King, and Slater (**Ground 1a**) render obvious claims 1, 5, and 7-9 of the '944 patent. Garcia discloses a remote check deposit system comprising a customer's handheld mobile device and a bank computer

connected to the handheld mobile device via a network. Garcia further discloses that the bank computer receives encrypted check images captured by the handheld mobile device over a secure connection, performs OCR on the check image to obtain data needed to process the check (e.g., check amount), and deposits the check into the customer's account. The bank computer in Garcia's system validates the check image by, for example, comparing the customer-entered amount and the OCR check amount to determine whether they match. If they match, the check is deposited, and the customer's bank account is updated accordingly.

41. King discloses a mobile device, such as a cell phone or a personal digital assistant ("PDA") that uses downloaded software, such as an app, to capture an image of a document. Slater discloses a system for end-to-end check processing, which includes various validation steps, such as comparing a customer-entered check amount and an OCR check amount.

42. Alternatively, Garcia, King, Watanabe, and Slater (**Ground 1b**) renders claims 1, 5, and 7-9 obvious. Watanabe expressly discloses assisting a customer to capture an image of a document in a correct orientation.

1. Garcia

43. Like the '944 patent, Garcia discloses a remote check deposit system that uses "a mobile device equipped with a **built-in camera**" to capture a digital image of both sides of the check, digitally encrypt the image and associated data

(e.g., the check amount and check number manually entered by the user), and transmit the encrypted digital image and associated data over a **network** “to the **institution** that needs to accept the document.” Garcia, 4:13-6:21, 7:18-22, 9:10-11:6, 12:5-13.

44. The **financial institution** has “computer equipment connected to the internet that is equipped with an optical character recognition (OCR) system, a key authentication system, and a means for transmitting the data to the institution’s document processing system,” which recognizes, verifies, and processes the information sent by the user. *Id.*, 11:8-15. The **institution** validates the message and “obtain[s] a digital photograph of the check and a series of data that enable it to automatically process the deposit of said check into the account of the service user” by “the usual means (truncating systems).” *Id.*, 12:16-21, 11:15-18.

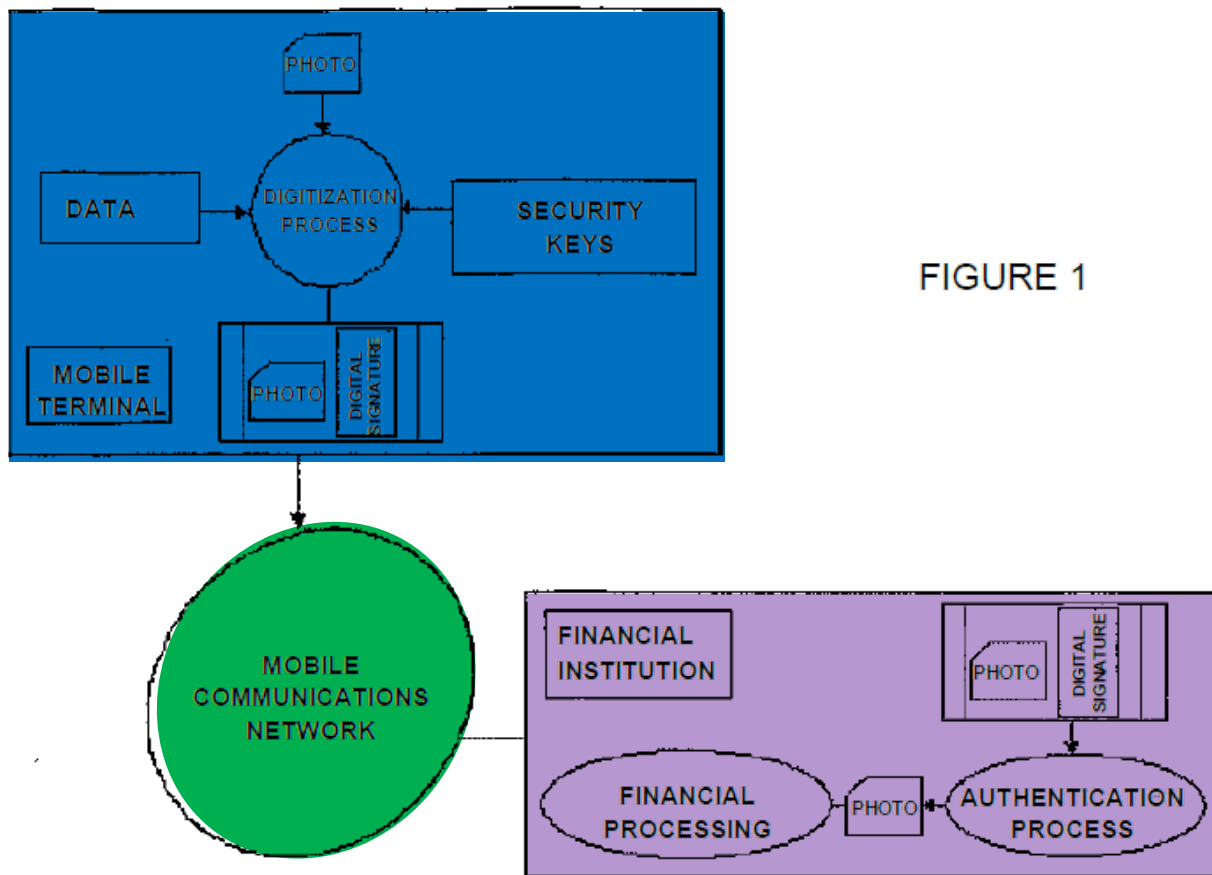


FIGURE 1

Garcia, FIG. 1 (annotated).

2. King

45. King discloses document imaging and processing systems. King, [0004]. King discloses several hardware configurations for capturing images of paper documents. One configuration uses a separate imaging device in communication with a “host” device “such as a PC [Personal Computer], PDA [(Personal Digital Assistant)], phone or digital camera.” *Id.*, [0231]. Another configuration uses capture functionality “built into” a “mobile phone, PDA, digital camera or portable music player,” *id.*, [0277], and discloses mobile devices including a “PC, PDA, phone or digital camera,” or a “portable music player.” *Id.*,

[0231], [0277]. Using a mobile device with a camera to capture images of paper documents is ubiquitous throughout King. *Id.*, [0021] (“optical capture using a scanner or camera (for example a camera in a cellphone)”), [0031], [0035], [0042], [0110], [0211], [0227] (“scanner and host laptop”), [0305]-[0308], [0307] (“the camera built into many mobile phones is used to capture an image of the text”), FIG. 2 (depicting a laptop computer, mobile phone, PDA):

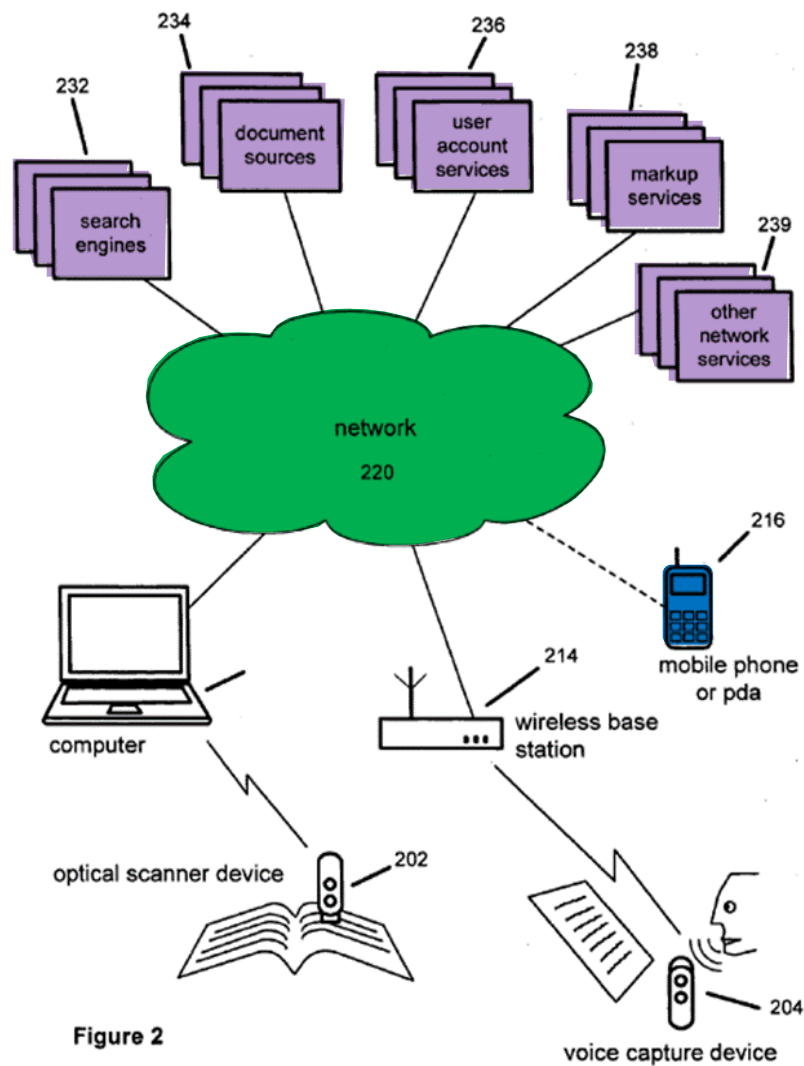


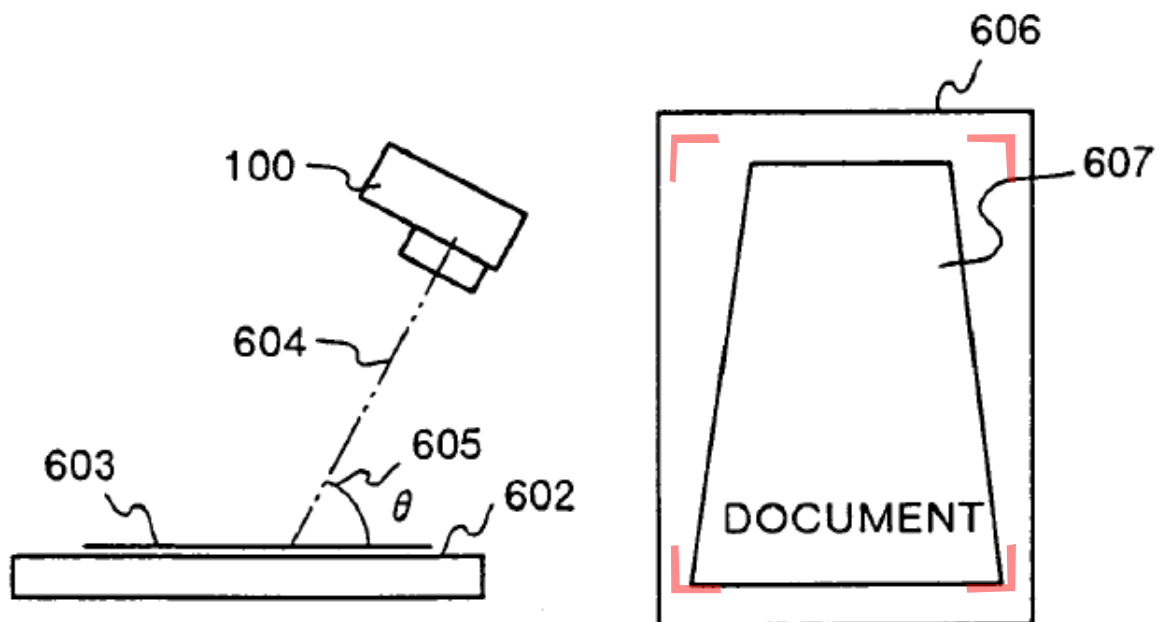
Figure 2

King, FIG. 2.

46. When a modified mobile phone is used as a capture device, King discloses that “[m]any modern phones have the ability to download software that could implement some parts of the system.” *Id.*, [306].

3. Watanabe

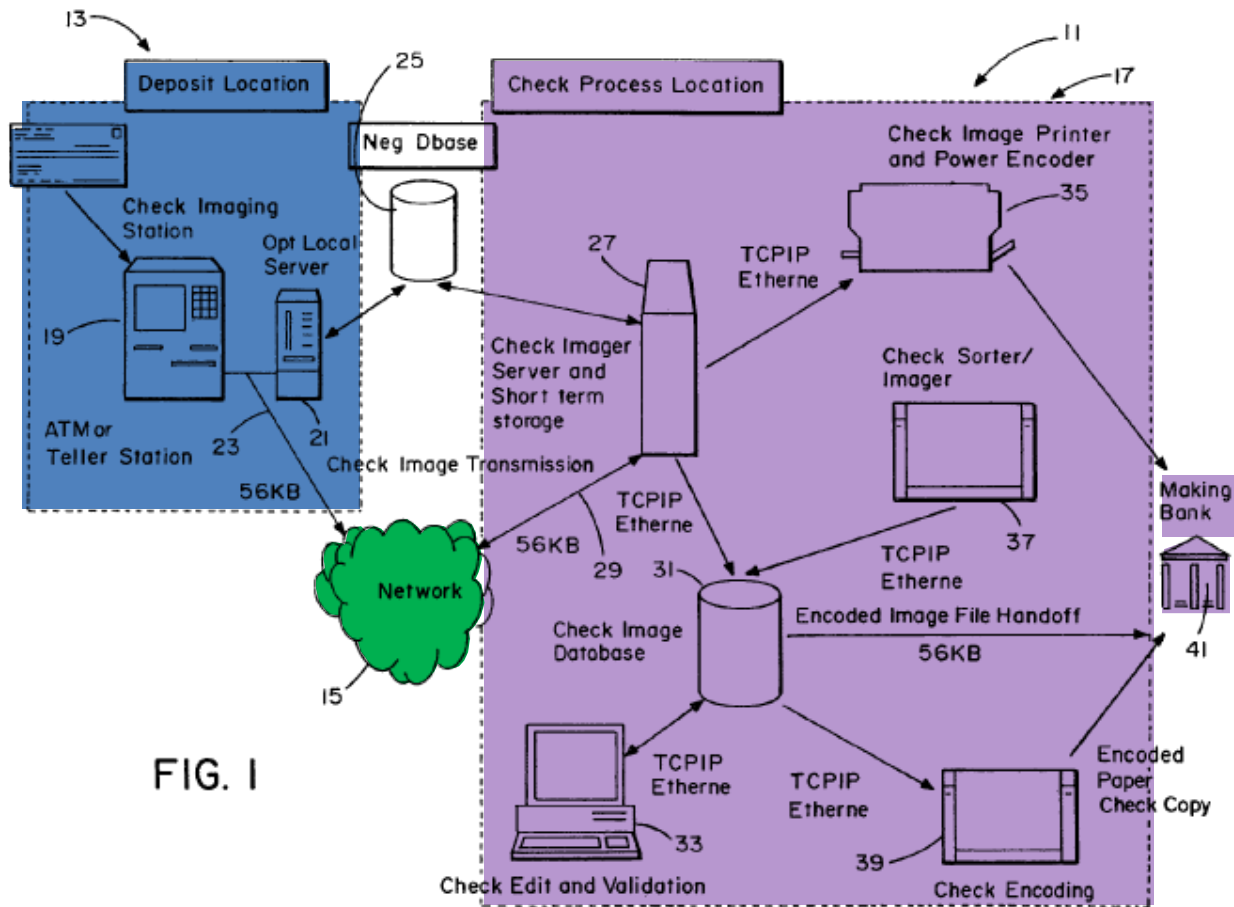
47. Watanabe discloses a digital camera for capturing an image of a document. Watanabe, 1:7-10. The digital camera includes a display that displays a picture of the document and guidance (e.g., a guidance frame) to assist the user with properly orienting the document and image capture device and capturing an image suitable for further processing, like OCR. *Id.*, 7:16-35. Watanabe’s system also “notifies the operator of a message to the effect that the angle of photography is not vertical (guidance display or the like is performed).” *Id.*, 12:17-22.



Watanabe, FIG. 5B (modified as disclosed by Watanabe).

4. Slater

48. Slater discloses a system that allows a customer to deposit a check at a “remote” “deposit location,” separate from a “check processing location.” Slater, 2:10-14, 4:1-26. Slater discloses “scanning a check to create an electronic image of the front and back of the check, captur[ing] the MICR code line data through . . . optical character recognition (OCR) technology, and then processing and transmitting the scanned check and captured MICR code line data electronically to a **central location**.” *Id.*, 2:42-48. The check is “presented in an electronic access location, such as an automatic teller machine (ATM), a **customer access terminal (CAT)**, or other check scanning depository terminal connected to a **network**.” *Id.*, 2:54-58. A check is scanned at a CAT, and the customer inputs the check amount. *Id.*, 4:56-60. The CAT can validate the check using “Courtesy A[mount] Recognition (CAR) software and Legal Amount Recognition (LAR) software” to “determine the check amount” and compare “the scanned amount and the entered amount.” *Id.*, 4:60-66. If the scanned amount matches the entered amount, “the transaction proceeds.” *Id.*, 4:65-66. If not, a customer service operator resolves the discrepancy. *Id.*, 4:66-5:3.



Slater, FIG. 1 (annotated with color).

B. Rationale for Combining Garcia, King, [Watanabe (1b)], and Slater

49. In my opinion, a POSA would have been motivated to combine Garcia, Slater, Watanabe, and King.

1. The References Are Analogous Art and Share a Common Architecture

50. In my opinion, the references are analogous to the '944 patent because they are in the same field of endeavor: the electronic capturing of documents for

transmission over a network. The '944 patent claims are directed to capturing a check image with a digital camera in a mobile phone, assisting a customer in taking the photo of the check, transmitting the photo to the bank to check for any errors in the check, and depositing the check if no errors are detected. Ex. 1001, claim 1.

51. **Garcia** discloses using a mobile phone with a built-in digital camera to capture an image of a check, transmitting the image over the network to the receiving institution, where the check information is validated, and “automatically process[ing] the deposit of said check into the account of the service user.” Garcia, 4:13-19, 7:18-8:13, 11:8-18, 12:16-21.

52. **King** discloses a system for using a mobile device equipped with a digital camera and downloadable software to capture images of paper documents and transmit them through the network. King, [0300]-[0309].

53. **Watanabe** discloses a digital camera for imaging a paper document in “any data format that a destination (a facsimile or a personal computer) selected by a user requires.” Watanabe, Abstract.

54. **Slater** also discloses processing a check for a remote deposit using a customer access terminal (“CAT”), which scans an image of the check, collects Magnetic Image Character Recognition (“MICR”) code line and other information

about the check and deposit account, and transmits the image and data directly to an image remote system capable for processing. Slater, 2:10-14.

55. Because all references generally disclose electronically capturing images of documents for transmission over a network with components that were well-known in the art at the time, it is my opinion that a POSA would have found them combinable with a reasonable expectation of success.

2. Combining Garcia, King, Watanabe, and Slater

a. Downloaded app for assisting a customer in view of Watanabe and King

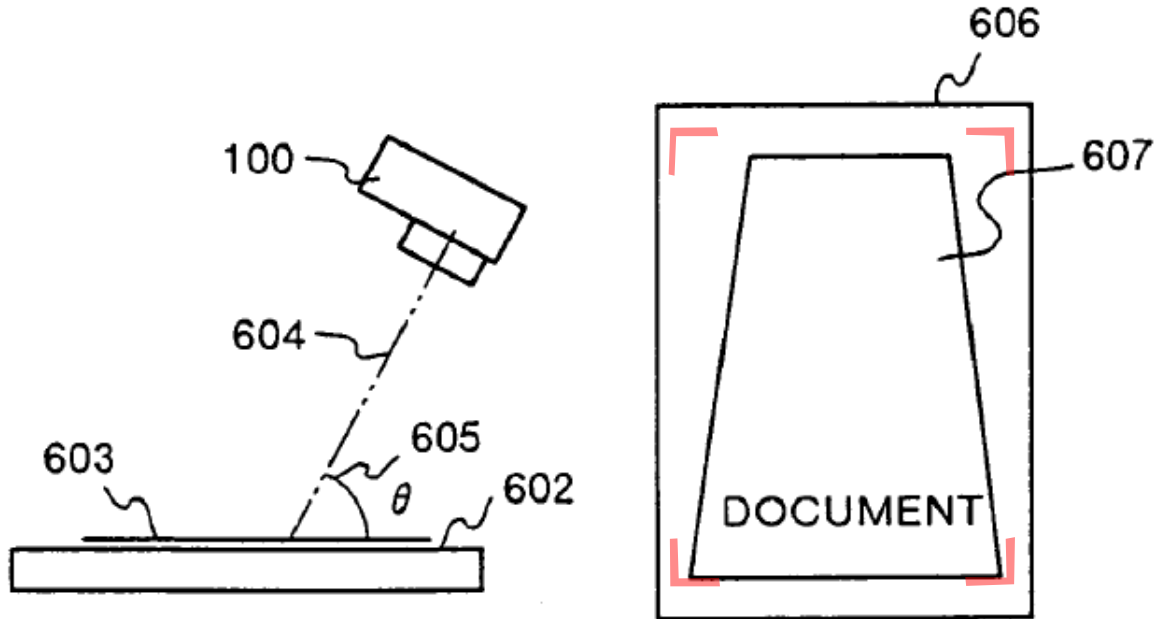
56. Garcia discloses a mobile device that incorporates a digital camera to capture check images and transmit them to the bank. Garcia, 4:13-19, 5:8-6:21. Garcia further discloses using “a computer application on the mobile telephone” to establish an interactive session with the receiving institution, indicating that application software is used to mediate a customer’s mobile phone and the financial institution. *Id.*, 9:20-10:2. A POSA would have also recognized that software is required to use the camera for capturing an image of a check for remote deposit purposes. It was well-known that in some mobile phones, “the phone hardware is not modified to support the system,” in which case software (i.e., app) is downloaded to “implement some parts of the system.” King, [0306].

57. In my opinion, a POSA would have been motivated to implement software features that would increase the accuracy of information captured in the

image of the check, “which is a critical component of any financial processing system particularly with high speed online processing.” Randle, [0057]. For example, a POSA would have recognized that it is important to capture a high-quality image of the check at the beginning of the electronic check clearing process to obviate the need for additional quality assurance steps later in the process. Randle [0004]. To this end, a POSA would have been motivated to implement features that would assist a customer in capturing a clear photo of the check to ensure that it is in a proper format for the check clearing process. Watanabe, 1:39-61. For example, a POSA would have recognized that this could be achieved by guiding the customer to properly orient the check before capturing its image, so that the check processing system can recognize and validate critical information (e.g., MICR line and check amount) of the check.

58. In my opinion, a POSA would have readily understood that Watanabe discloses this feature. Watanabe discloses a digital camera for capturing a document image, which can be transmitted over the network. Watanabe, 3:9-19. Watanabe’s camera displays a guidance frame and messages assisting a customer with achieving a proper orientation of the document (e.g., the angle of photography is vertical). *Id.*, 7:55-8:26. These instructions are displayed until the digital camera recognizes that the document is oriented correctly. *Id.* A POSA would have had a reasonable expectation of success in combining Garcia and Watanabe because

guiding a handheld mobile device user to take photos that satisfy quality assurance criteria was well known in the art at the time. Ex. 1012, [0042], [0117]-[0119].



Watanabe, FIG. 5B (modified as disclosed by Watanabe).

59. In my opinion, a POSA would have had a reasonable expectation of success in combining these features because prior art recognized that mobile phones with cameras that can be used to capture images of documents “have the ability to download software that could implement some parts of the system.” King, [0306]. A POSA would have recognized that providing guidance to a customer taking the photo is one such feature that could be implemented via downloaded software. Thus, the combination would have involved combining prior art elements (e.g., a mobile phone, a downloadable application, and feedback regarding the photographing process) according to known methods (e.g., known

software development methods for mobile phones) to yield predictable results

(e.g., a downloaded app for mobile check deposit for capturing images suitable for the check clearing process) and applying a known technique to a known device ready for improvement to yield predictable results.

b. Validating checks in view of Slater

60. Garcia further discloses “**computer equipment** at the [financial] institution” that validates and deposits a check image received from a “mobile device.” Garcia, 4:11-19, 9:10-22. Garcia, however, does not expressly disclose details about how the computer equipment implements these processes. Thus, a POSA would have been motivated to look to other references, such as Slater, which discloses implementation details for Garcia’s system. Ex. 1016, 25-26.

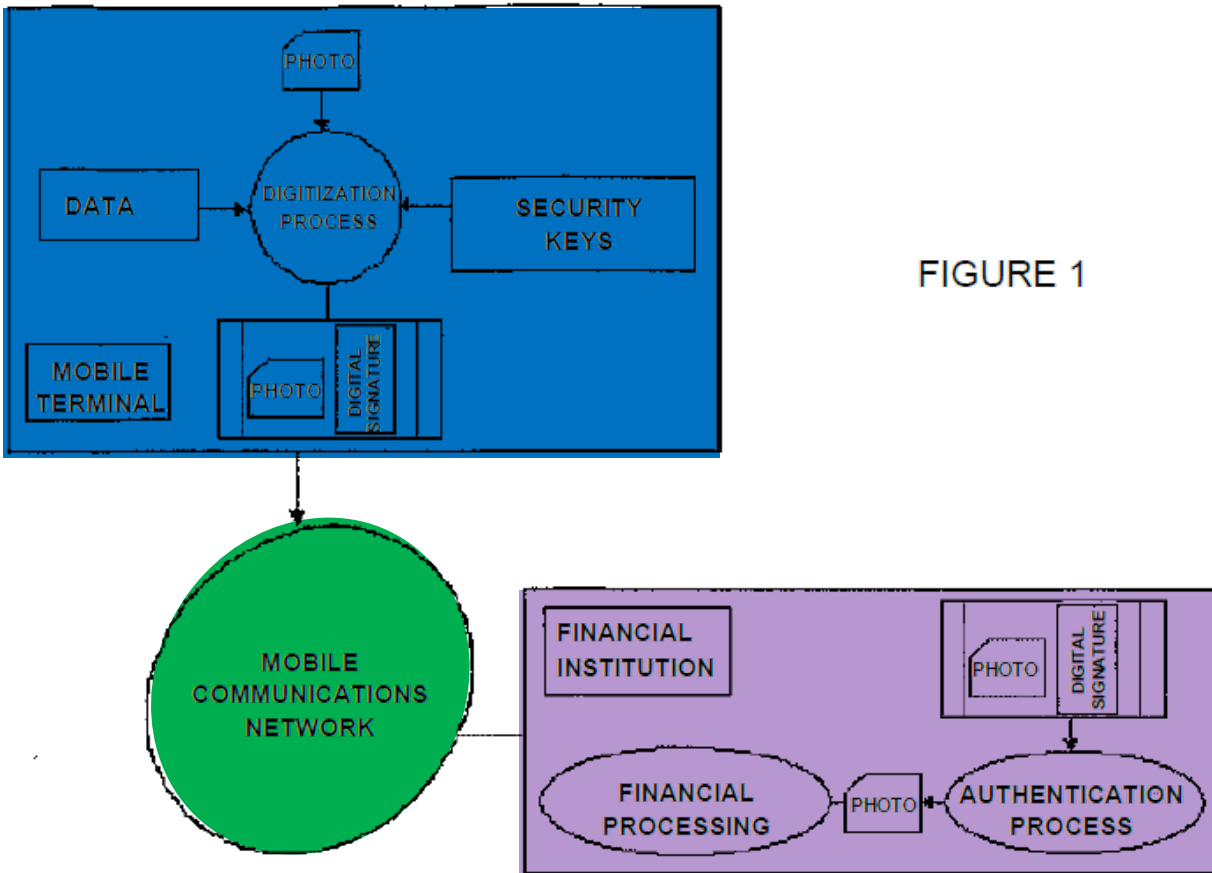


FIGURE 1

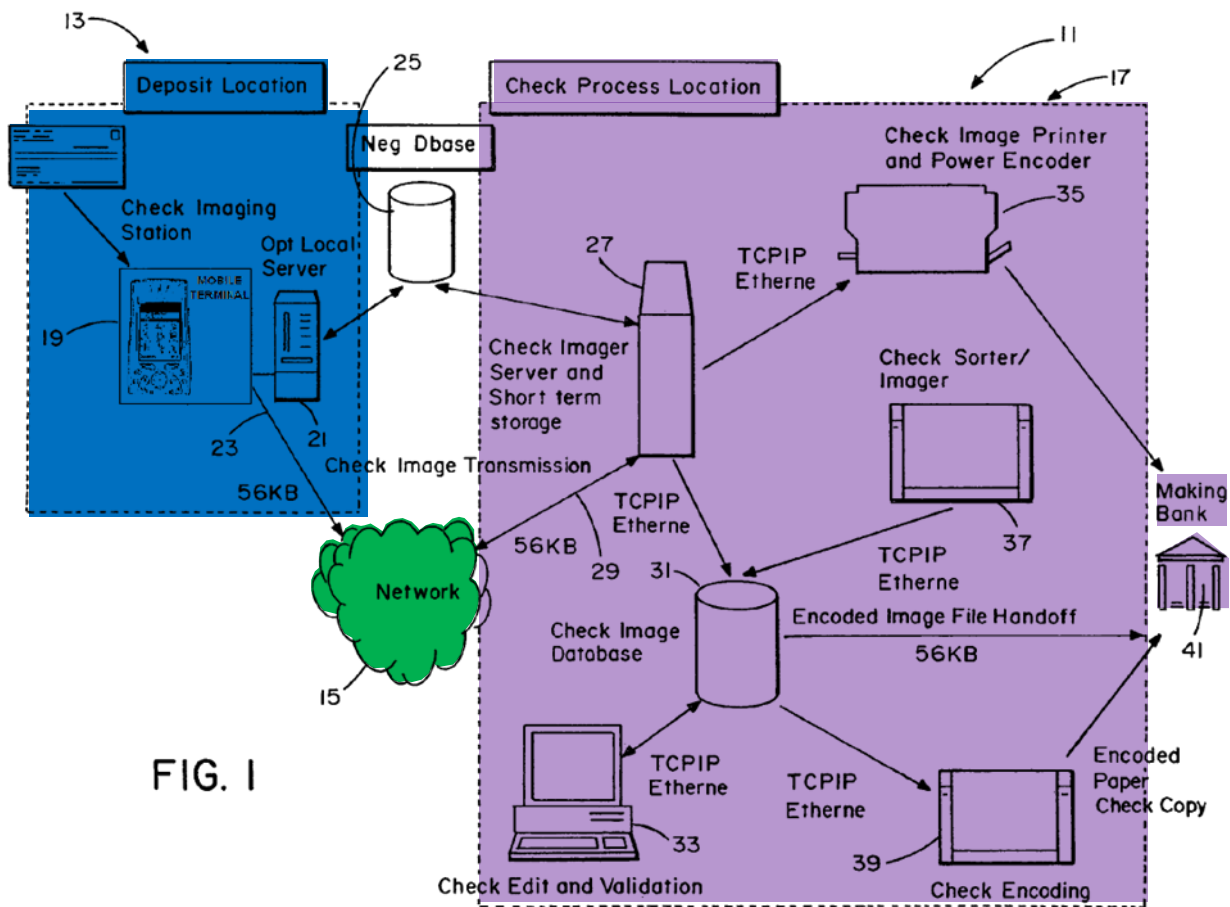
Garcia, FIG. 1 (annotated with color).

61. Garcia recognized the need for the bank's receiving system to "recognize, verify, and electronically process" the transmitted data. Garcia, 11:8-10. To this end, Garcia equipped the bank's computer equipment "with an optical character recognition (OCR) system." *Id.*, 11:8-18. Garcia further discloses capturing data associated with a check, such as the check amount and number. *Id.*, 10:15-16; Ex. 1016, 61-62 (finding that "Garcia expressly states that the bank's computer equipment 'has an optical character recognition (OCR) system' for 'recognizing, verifying and processing the information sent by the user,' which

includes the check image as well as recognition data entered by the user (e.g., check amount)), 43-44. In fact, this was a well-known feature in the art at the time. *See* Randle, [0019], [0021], [0042], [0074]; Ex. 1016, 61-62. A POSA would have thus understood that Garcia uses OCR to determine the check amount. Slater, 4:60-63; Ex. 1016, 61-62, 43-44. Garcia further discloses that “[t]hrough the keyboard, the user enters the previously mentioned identifying data, such as the check amount . . . before sending it.” Garcia, 12:10-13. Garcia does not expressly disclose comparing scanned and customer-input amounts of the check, but a POSA would have understood that Garcia accepts the customer-input amount for this purpose given that this was a well-known validation process in the art at the time. Slater, 4:63-66 (“A comparison between the scanned amount and the entered amount is made, and if there is a match, the transaction proceeds.”). A POSA would have understood that a key reason to capture both OCR and customer-entered amounts is to address the possibility of a discrepancy between the two amounts that can be used for validation.

62. A POSA would have found it obvious to implement this comparison step in the **bank’s computer** disclosed in Garcia because, in a valid transaction, the scanned amount and the customer-entered amount should match. Since Garcia already discloses validating and clearing check transactions (Garcia, 4:13-19, 5:1-9), a POSA would have been motivated to implement Slater’s comparison step to

predictably reduce errors associated with check information and thereby improve reliability of the deposit system. A POSA would have understood that performing this validation step early in the process reduces the need for more costly downstream validation processes, increasing efficiency and decreasing cost associated with a remote check deposit. A POSA would have also understood that the comparison step can be performed either on the front end in the customer terminal or on the back end in the bank's computer, and the location does not have any material effect on the check clearing process.



Slater FIG. 1 modified in view of Garcia FIG. 2 (annotated with color).

63. This combination would have involved the use of a known technique (e.g., comparing a check amount input by a user and a check amount determined by OCR) to improve similar devices in the same way (e.g., improve validation technique in a remote check deposit system using a mobile phone). It would have also involved combining prior art elements (e.g., Garcia's check processing system and Slater's validation technique) according to known methods (e.g., comparing check amount input by user and check amount determined by OCR) to yield predictable results of improving the accuracy of check transaction validation (e.g., improving validation reliability).

64. And it would have involved a simple substitution of one known element for another (e.g., Slater's CAT with Garcia's mobile device with a built-in camera) to yield predictable results (e.g., a remote check deposit system using a mobile phone). At a minimum, it would have been obvious to try to combine these features because there was a design need for validating checks, and a POSA would have appreciated that Slater provided a predictable, improved solution for such validation. A POSA would have had a reasonable expectation of success in making this combination because, for example, Slater discloses using a CAT, which has "a scanner or check imager in place of a traditional envelope deposit slot," and a POSA would have recognized that handheld mobile devices equipped with

cameras can function as check imagers for remote check deposit. Slater, 4:42-44, 9:51-54.

C. Claim 1

1. [1pre] A system for allowing a customer to deposit a check using a customer's own handheld mobile device,

65. It is my opinion that Garcia discloses or renders obvious [1pre].

66. Garcia discloses a “system” used for “the validation and deposit of checks into an existing bank account by a user employing a **mobile device** equipped with a built-in camera that is capable of capturing and transmitting digital images.” Garcia, 4:13-19, 7:18-8:1. Garcia’s **mobile device** is connected to a **bank computer** via **mobile communications network**. Garcia, FIGS. 1-2. Garcia’s mobile device is a user’s own device and is handheld. *Id.*, 9:13-14 (“the use of a mobile device by the user of the service”).

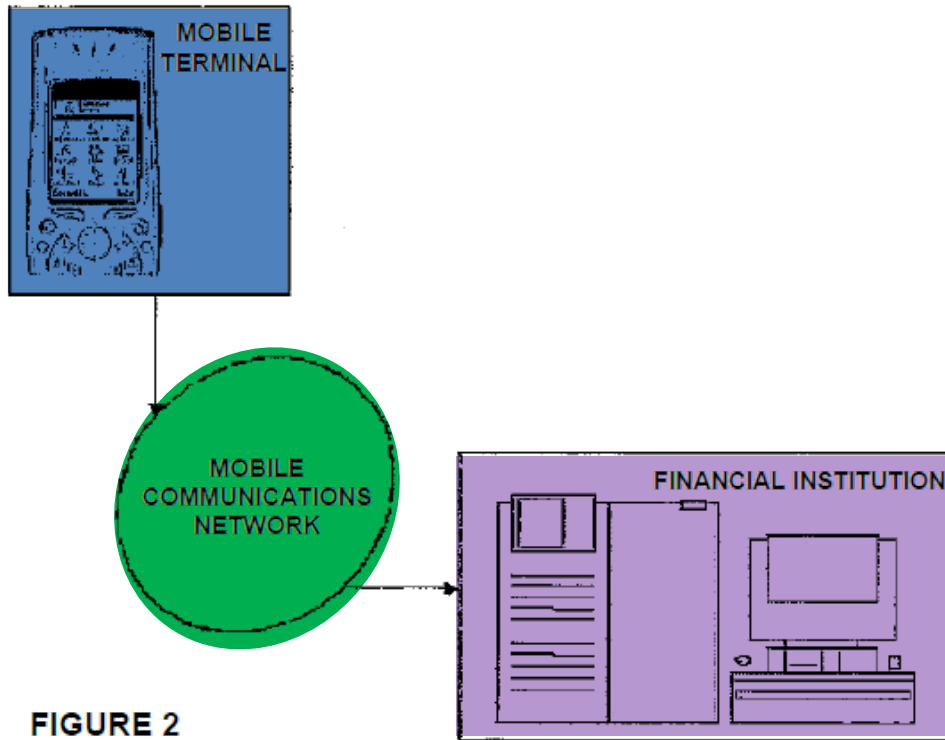


FIGURE 2

Garcia, FIG. 1 (annotated with color).

2. [1a] the system including: a customer's handheld mobile device including a downloaded app,

67. It is my opinion that Garcia alone or in combination with King renders obvious [1a].

68. As explained for [1pre] (Section VI.C.1), Garcia discloses a customer's mobile device.

69. Garcia teaches that its handheld mobile device includes a downloaded app because Garcia discloses that the "equipment needed by the user must enable:

a) Identifying the user, wherein the user opens a computer application on the

mobile telephone in which an interactive session is established with the receiving institution through the mobile communications operator.” Garcia, 9:18-10:2.

70. In my opinion, a POSA would have understood that Garcia’s “computer application on the mobile telephone” is a downloaded app associated with a bank. A POSA would have understood that Garcia’s mobile check deposit requires downloading an app associated with a bank, which was well known at the time. For example, in 2005, “[b]anking via mobile phone [was] not new.” Ex. 1013, 1. There were tens—if not hundreds—of millions of mobile phones in operation, and bank customers downloaded software that “offer[ed] customers full-service banking from their mobile phones.” *Id.*

71. If Patent Owner contends Garcia does not disclose this limitation, King does. King explains that “modern phones have the ability to download software that could implement some parts of the system,” to provide uninterrupted functionality while offline. King, [0306], [0227]. A POSA would have understood that controlling Garcia’s remote check deposit system using downloaded software was known before 2006, as evidenced by U.S. Patent Pub. No. 2005/0097046 to Singfield. Singfield discloses online check deposit transactions using an Internet-capable mobile device that connects to the Internet and downloads computer program software. Ex. 1014, claims 1, 6, 21.

72. While I do not believe that this combination is even needed, to the extent this combination is needed, it would have been obvious to a POSA to implement Garcia's computer application on the mobile telephone as a downloaded application, as taught by King. The combination would have involved nothing more than applying King's downloaded software to the mobile telephones or other mobile terminals, such as PDAs, disclosed in Garcia. Garcia, 2:17-23. Downloading Garcia's computer application on the mobile telephone using King's technique would have yielded predictable results of facilitating mobile banking using the Internet.

73. In my opinion, a POSA would have expected success in implementing Garcia's computer application on the mobile telephone as a downloaded application, as taught by King. Garcia's hardware would not require any modification because its mobile telephone or mobile terminal is already capable of communicating via the Internet and storing Internet-based applications. *See, e.g., id.*, 1:12-14 ("a mobile device capable of capturing and sending images through an internet connection."), 3:4-7. Only minimal routine programming would have been needed to download software to Garcia's mobile telephones or mobile terminals. To the extent any modification to the programming or to the software was needed to enable downloading, such modification was well within the skill of a POSA. It

would have been obvious to combine Garcia and King to control Garcia's system using downloaded software on a customer's mobile device.

3. **[1b] the downloaded app associated with a bank and causing the customer's handheld mobile device to: receive input entered by the customer indicating an amount of the check;**

74. It is my opinion that Garcia alone or in combination with King renders obvious [1b].

75. As explained for [1a] (Section VI.C.2), Garcia alone or in combination with King teaches a downloaded app associated with a bank. *See, e.g.,* Garcia, 9:18-10:2.

76. Garcia further discloses receiving an input from the customer indicating the amount because it discloses, "[t]hrough the keyboard, the user enters the previously mentioned identifying data, such as **the check amount**, and all the data and keys necessary for the operation of the system, before sending it." *Id.*, 12:10-13; *see also* 3:17-20, 5:15-21, 14:13-20. From this disclosure, a POSA would have understood that Garcia's computer application software prompts a user to enter the amount of the check, and therefore, Garcia's mobile device receives the customer-entered input indicating the amount of the check.

4. [1c] use a display of the customer's handheld mobile device to assist the customer in having a digital camera take a photo of the check;

77. It is my opinion that Garcia in combination with King (**Ground 1a**) or Garcia in combination with King and Watanabe (**Ground 1b**) renders obvious [1c].

78. For **Ground 1a**, Garcia discloses using “a mobile device equipped with a built-in camera . . . capturing and transmitting digital images, in addition to performing standard telephone operations.” Garcia, 4:13-19; *see also id.*, 11:1-6. Garcia’s handheld mobile device also includes a display. *See id.*, FIG. 2, 6:9, 8:7-10, 15:8.

79. King expressly discloses using a display of a customer’s handheld device to assist the customer to take a photo of a document. King states, “the camera built into many mobile phones is used to capture an image of the text.” King, [307]. And King states that the display is used to assist the customer, stating, “[t]he phone display, which would normally act as a viewfinder for the camera, may overlay on the live camera image information about the quality of the image and its suitability for OCR, which segments of text are being captured, and even a transcription of the text if the OCR can be performed on the phone.” *Id.* Because King uses the mobile device’s display as a viewfinder as well as to convey additional information, a POSA would have understood King to disclose using the

mobile device display to assist a customer with taking a photo of a document using the built-in digital camera.

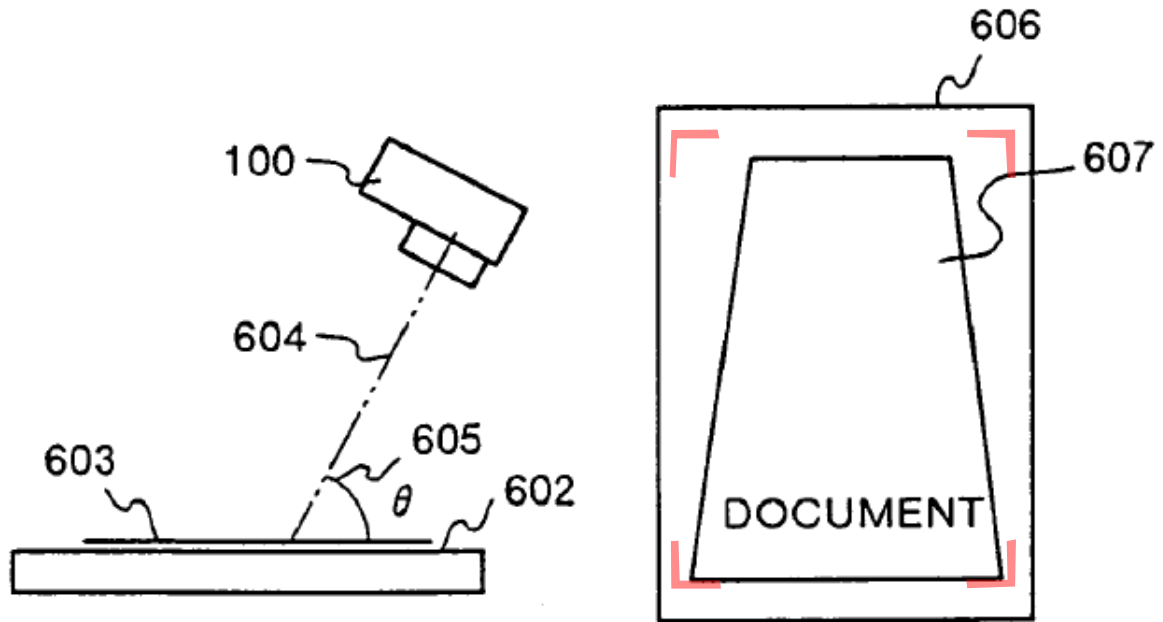
80. It was well known at the time that a viewfinder of a digital camera, such as a phone camera, has features for assisting a customer in having a digital camera to take a photo of the check. In a mobile phone or a PDA, the display screen acts as a viewfinder for its camera, which shows, for example, orientation of the image, levels of magnification, brightness, and white balance, and the amount of JPEG compression applied to the image. Ex. 1025, 4-5. These types of information are used to assist a user taking a good quality photo.

81. In my opinion, a POSA would have been motivated to modify Garcia's display to add King's overlay feature displaying image information to assist the customer in taking a photo of the check that is suitable for OCR and further processing. Garcia discloses capturing an image of a check for OCR, and thus, a POSA would have found it advantageous to add King's feature to increase the quality of the check image for more accurate recognition of the check information. A POSA would have found the combination obvious because it involves combining prior art elements (capturing an image using a mobile phone and displaying an overlay image on the live camera image information for the camera on a display of the mobile phone) according to known methods (like a digital camera displaying image information on its screen) to yield predictable

results (assist the customer to capture a check image suitable for processing). A

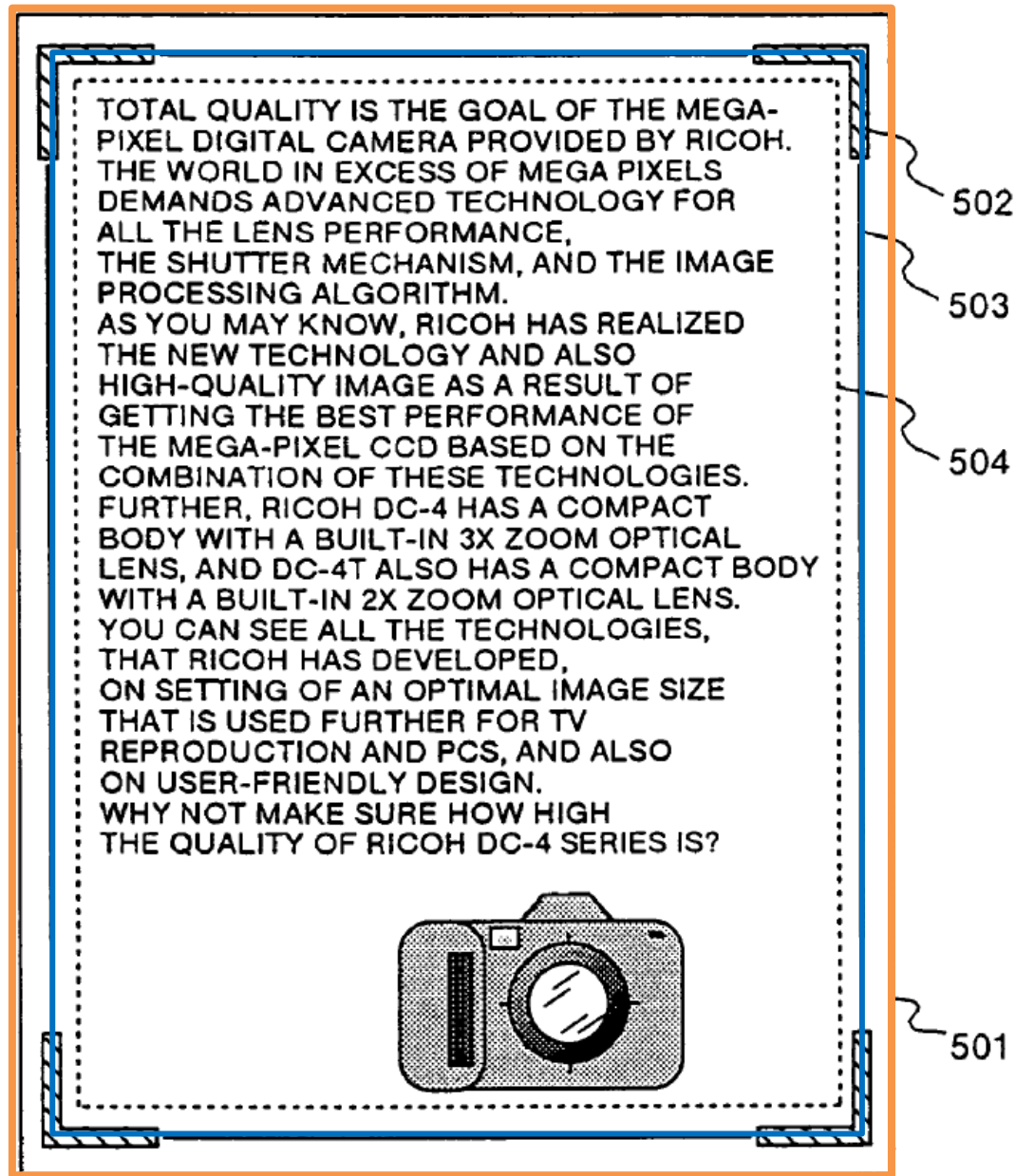
POSA would have had a reasonable expectation of success in combining these features because Garcia and King both disclose capturing images of documents for OCR using mobile phones.

82. **For Ground 1b**, to the extent Patent Owner argues this limitation requires specific instructions or feedback on the display to “assist the customer,” Garcia-King-Watanabe renders it obvious. Watanabe discloses a digital camera including a display that “generates a guidance graphic on the display control section 104 according to the operation, and then guides the user to perform the next operation.” Watanabe, 5:32-35. Watanabe discloses displaying on the LCD a guidance frame on whether the angle of photography is vertical. *Id.*, 7:20-26, 12:12-22, FIGS. 5A-5B. When the displayed image of the document contains distortion, as shown in Figure 5B, a user can tilt the camera while visually inspecting whether the shape of the document is rectangular like the guidance frame (red), because the image shown on the LCD “changes seamlessly in association with inclinations of the digital camera.” Watanabe, 7:64-67.



Watanabe, FIG. 5B (modified as disclosed by Watanabe).

83. In my opinion, a POSA would have understood that as combined, the downloaded app in Garcia's mobile phone causes its display to display Watanabe's guidance frame to assist the customer in using the digital camera to capture a picture of the check. Garcia's app would monitor the displayed image and determine whether it comports with image quality control criteria, such as the shape of the document. Watanabe, 12:1-31. If the app determines that the image does not meet the quality control criteria, it will cause Garcia's mobile device to display additional guidance to assist the customer in taking a photo of the check. Watanabe, 12:1-31.



Watanabe, FIG. 4 (annotated with colored lines).

84. As explained in Section VI.B, a POSA would have been motivated to modify Garcia's mobile phone's digital camera with Watanabe's guidance frame to provide assistance to a customer taking a photo of the check to ensure that the photo is suitable for accurately recognizing information on the check.

5. [1d] assist the customer as to an orientation for taking the photo; and

85. It is my opinion that Garcia in combination with King (**Ground 1a**) or Garcia in combination with King and Watanabe (**Ground 1b**) renders obvious [1d].

86. For **Ground 1a**, as explained for [1c] (Section VI.C.4), Garcia in combination with King teaches using a display on a mobile phone built-in digital camera to assist a customer in taking a photo of a check. King discloses, “[t]he phone display, which would normally act as a viewfinder for the camera, may overlay on the live camera image information about the quality of the image and its suitability for OCR, which segments of text are being captured, and even a transcription of the text if the OCR can be performed on the phone.” King, [0307] A POSA would have understood this disclosure at least suggests assisting the customer as to an orientation for taking the photo for two compounding reasons. For example, a POSA would have understood that some cameras are designed for portrait orientation while others are designed for landscape orientation, and thus, a POSA could look at the viewfinder (display) to determine which orientation is more suitable for the photo being taken. Ex. 1025 at 4.

87. First, King’s displaying the live camera image on the mobile device display acting as a viewfinder (King, [307]) at least suggests assisting with orientation because the very purpose of a viewfinder and live display of the camera

image is to allow the customer to properly frame and orient the photograph. A customer using King would have understood, using the viewfinder and live display, whether the check and digital camera were properly aligned at the correct orientation so that the entire check can be seen clearly in the captured image.

88. Second, King's overlaying "information about the quality of the image and its suitability for OCR, which segments of text are being captured, and even a transcription of the text if the OCR can be performed on the phone" (King, [307]) at least suggests assisting with orientation because improper orientation of the document would have been understood to prohibit performing OCR. Ex. 1015, 1:13-32 ("A major problem in optical character recognition is determining the proper orientation of the symbols."). Therefore, instructing the customer on whether the image is suitable for OCR and whether all text can be seen in the document image at least suggests assisting with orientation of the document because a customer would know to adjust the orientation of the document if OCR cannot be performed or if all text cannot be seen in the image.

89. **For Ground 1b**, to the extent Patent Owner argues this limitation requires specific instructions or feedback on the display to "assist the customer as to an orientation," Garcia-King-Watanabe renders it obvious. Watanabe discloses assisting the customer as to an orientation for taking the photo.

90. Watanabe discloses that “photography is started only when the angle of photography is substantially vertical to the surface of the subject,” so that “a proper image of the document can be obtained.” Watanabe, 2:55-61. When Watanabe’s camera detects that the angle of photography is not vertical, for example, its width or length is not parallel to the document (e.g., a trapezoidal shape shown in Figure 5B), the camera repeats the processes of displaying the guidance frame and detecting the angle of photography until the customer orients the document vertically. *Id.*, 8:9-16.

91. As explained in Section VI.B above, it is my opinion that a POSA would have found it obvious to implement Watanabe’s feedback on the orientation of the image of the captured check in Garcia-King’s mobile phone with a downloaded app to ensure that the check is correctly oriented to accurately read the check information.

6. [1e] using a wireless network, transmit a copy of the photo over the Internet from the customers handheld mobile device to the bank;

92. It is my opinion that Garcia in combination with King renders obvious [1e].

93. Garcia discloses using a wireless network because its “mobile device [is] capable of capturing and sending images through an internet connection.”

Garcia, 1:8-14; *see also id.*, 11:10-15. Garcia also discloses that each user and the

financial institution are connected through “a mobile telecommunications network, for example a GSM/GPRS network or any future technological capabilities that are adapted to the present and future demands of the method of reference.” *Id.*, 11:20-12:3. Garcia discloses “a method of document processing and acceptance, such as, for example, **bank checks**, that guarantees the authentication of the issuer and of the document itself and takes places electronically by means of a mobile device capable of capturing and sending images through an internet connection.” *Id.*, 1:8-14 (emphasis added). As part of this method, Garcia discloses “[t]ransmitting the digital image and the recognition data, once encrypted, to the institution that needs to accept the document.” *Id.*, 10:21-23. A POSA would have understood that the receiving institution is a bank because Garcia discloses methods of electronic banking and the images transmitted are “bank checks.” *Id.*, 1:18-2:15.

7. [1f] a bank computer programmed to: check for errors in the check in the photo by:

94. It is my opinion that Garcia discloses [1f].

95. Garcia discloses a bank computer because it discloses that the receiving banks have “computer equipment connected to the internet that is equipped with an optical character recognition (OCR) system, a key authentication system, and a means for transmitting the data to the institution’s document processing system.” Garcia, 11:10-18.

96. Garcia discloses that the bank computer checks for errors in the check in the photo because it discloses that the bank's computer is capable of "[r]ecognizing, verifying, and electronically processing the data received by said institution." Garcia, 6:11-12. A POSA would have understood that Garcia's verification system checks for errors in the check in the photo. Such verification processes were well known in the art, including checking for the presence of a signature and endorsement on the check. Randle, [0074].

97. If Patent Owner argues that Garcia does not disclose this limitation, Slater does. Slater discloses comparing a check amount determined through OCR (e.g., Courtesy A[mount] Recognition (CAR) and Legal Amount Recognition (LAR)) software with a customer-entered amount "for improved confidence." Slater, 4:60-63. If the two amounts do not match, due to an error, for example in the OCR amount, "the system will send the check image to a customer service operator who will be able to read the check and resolve any discrepancies." *Id.*, 4:66-5:3. Indeed, I understand that the Board found in a related IPR proceeding for a related USAA patent IPR2021-01077 ("1077 IPR") that "this comparison would improve reliability because '[a]ny discrepancy would mean there was error either in the user input or the image from which the check amount is read[.]'" Ex. 1016, 62.

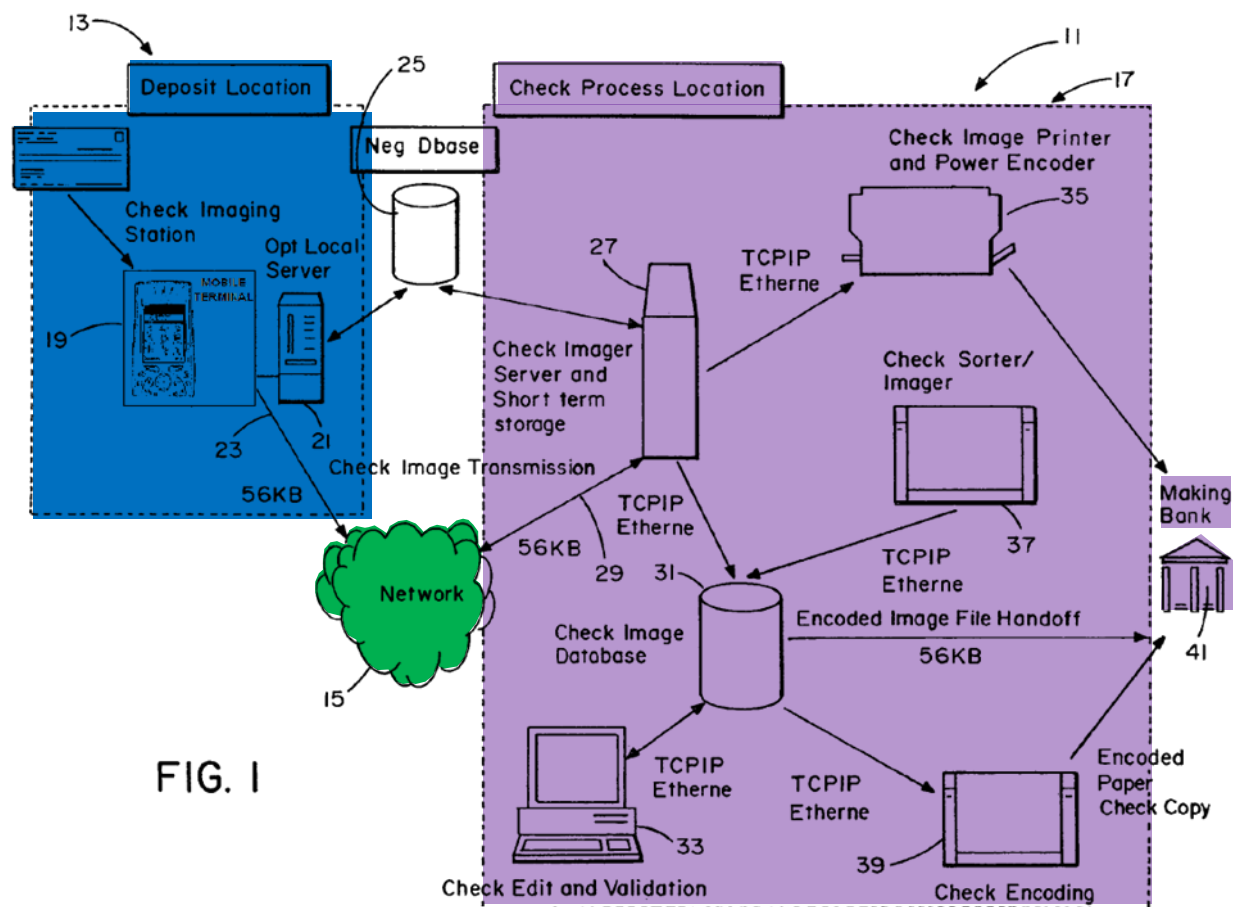
8. [1g] performing optical character recognition on the check in the photo to determine an amount shown on the check, and

98. It is my opinion that Garcia alone or in combination with Slater renders obvious [1g].

99. Garcia discloses that the receiving banks have “computer equipment connected to the internet that is equipped with an optical character recognition (OCR) system, a key authentication system, and a means for transmitting the data to the institution’s document processing system.” Garcia, 11:10-18. Garcia further discloses “[c]apturing data associated with the document, such as, for example, the check amount and number.” Garcia, 10:15-16. A POSA would have understood that capturing the check amount refers to optical character recognition of the check amount. In fact, I understand that in the 1077 IPR, the Board expressly found that “Garcia suggests performing an OCR on the check image as part of” a remote check deposit process, and that “this OCR is necessary for deposit.” Ex. 1016, 61-62, 43-44.

100. If Patent Owner disputes this limitation, however, Slater discloses it. Slater discloses that its customer access terminal (CAT) “can be programmed to validate check items through MICR code line and OCR software.” Slater, 4:56-57. Slater further discloses that “[t]he CAT can then determine the check amount through a combination of Courtesy A[mount] Recognition (CAR) software and

101. In my opinion, a POSA would have found it obvious to combine Garcia and Slater because they disclose the same system architecture with a customer terminal and a bank computer connected via a network. A POSA would have understood that Slater discloses the implementation details of Garcia's bank computer, and that the CAT in Slater can be substituted with Garcia's mobile phone equipped with a digital camera, as shown in the combined figure below.



Slater FIG. 1 modified in view of Garcia FIG. 2.

9. [1h] comparing the amount shown to the amount entered by the customer; and

102. It is my opinion that Garcia in combination with Slater renders obvious [1h].

103. As explained for [1g] (Section VI.C.8), Garcia alone or combined with Slater discloses performing OCR to determine the check amount. Garcia also discloses that “[t]hrough the keyboard, the user enters the previously mentioned identifying data, such as the check amount, and all the data and keys necessary for the operation of the system, before sending it.” Garcia, 12:10-13, 5:15-21, 14:13-20. And Garcia discloses “capturing” the check amount, suggesting that this is captured through OCR. *Id.*, 10:15-16, 11:8-15. A POSA would have understood that the check amount is obtained by both a customer’s entry and OCR, so these two obtained values can be compared for validation. This was a well-known validation feature, as disclosed by Slater.

104. Slater discloses that “[t]he customer can then, using an appropriate keyboard, input the check amount.” Slater, 4:59-60. Slater also discloses, “[a] comparison between the scanned amount and the entered amount is made, and if there is a match, the transaction proceeds.” *Id.*, 4:63-66. “If the customer’s input and the courtesy amount recognition differ, even after a customer’s second input, the system will send the check image to a customer service operator who will be

able to read the check and resolve any discrepancies.” *Id.*, 4:66-5:3. Indeed, I understand that in the 1077 IPR, the Board found that “there would be no reason to capture both OCR and customer-entered versions unless there was a possibility of such discrepancy,” and thus, a POSA would have understood that the two amounts are collected for comparison to improve reliability. Ex. 1016, 62.

10. [1i] the system being configured to update a balance of an account after determining that no errors were found in the check in the photo.

105. It is my opinion that Garcia in combination with Slater renders obvious [1i].

106. Garcia discloses, “[t]he institution that receives the message proceeds to validate and encrypt [sic] it to obtain a digital photograph of the check and a series of data that enable it to automatically process the deposit of said check into the account of the service user.” Garcia, 12:16-21. Garcia further discloses “validating and depositing [the check amount] into a checking account of a banking institution, directly by a user from his mobile telephone, through his mobile communications operator.” *Id.*, 16:15-19. A POSA would have understood that the deposit of funds occurs after the check in the photo has been validated and confirmed that it is free of errors. A POSA would have understood that automatic processing refers to updating a balance of an account given that Garcia relates to electronic banking using mobile phones and specifically discloses methods of

electronically depositing bank checks. I understand that in the 1077 IPR, the Board found that “Garcia discloses that the bank’s computer equipment determines, in at least some circumstances, that the received digital image is sufficient to go forward with the deposit.” Ex. 1016, 66.

107. If Patent Owner argues that Garcia does not disclose this limitation, Slater discloses it. Slater discloses that “[i]f the amount determined by the access device and the amount entered by the customer are the same, the access device accepts the deposit.” Slater, 6:1-4. Slater further discloses, “the depository bank can send the electronic information directly to the payor bank or to another bank or service provider acting as the depository bank’s representative to create the MICR” to minimize “float” associated with “the availability of the funds to the depository bank from the deposited check.” *Id.*, 6:35-58. Once the check has been successfully verified and validated, including determining that the check is free of any errors, a POSA would have understood that the next logical step is to settle funds between the payee and payor banks. *See* Randle, [0019] (“In either instance at the time of clearing and settlement, bank to bank funds balances between and among participating banks are settled for the items cleared . . . Payee bank 21, receiving funds, will assign the funds represented by the financial instrument and credit the funds to the respective individual payee 3.”).

- D. Claim 5: The system of claim 1, wherein use of the display of the customer's handheld mobile device to assist the customer includes instructing the customer to have the digital camera take a photo of a front side of the check and a photo of a back side of the check.**

108. It is my opinion that Garcia in combination with King (**Ground 1a**) or Garcia in combination with King and Watanabe (**Ground 1b**) renders obvious claim 5.

109. For **Ground 1a**, as explained for [1c] (Section VI.C.4), Garcia discloses a handheld mobile device with a display, and King discloses displaying overlay information on the display about the quality of the image and its suitability for OCR. Garcia further discloses “[c]apturing a digital image of the front and the back sides of the document.” Garcia, 10:12-13. A POSA would have found it obvious to use the overlay information to display instructions to assist the customer to have the digital camera take front and back images to capture all necessary information about the check for verification and validation.

110. For **Ground 1b**, as explained for [1b] and [1c] (Sections VI.C.3-VI.C.4), Watanabe discloses using the display of the customer's handheld mobile device to assist the customer. Given that Garcia discloses capturing a digital image of the front and back sides of a check (Garcia, 10:12-13), a POSA would have found it obvious to modify the Garcia-Watanabe combination to instruct the customer to have the digital camera take a photo of a front side of the check and a photo of a back side of the check. To capture all necessary information for

processing checks, a POSA would have found it obvious to modify Watanabe's instructions to specify taking photos of front and back sides of the check. Randle, [0019].

E. Claim 7: The system of claim 1, wherein the customer's handheld mobile device further includes camera software that controls a customer's digital camera, the camera software being separate from the downloaded app, the downloaded app at least partially controlling the camera software.

111. It is my opinion that Garcia in combination with King (**Ground 1a**) or Garcia in combination with King and Watanabe (**Ground 1b**) renders obvious claim 7.

112. Garcia discloses that its mobile device is "equipped with a built-in camera that is capable of capturing and transmitting digital images, in addition to performing standard telephone operations." Garcia, 4:16-19. King discloses that "[m]any modern phones have the ability to download software that could implement some parts of the system." King, [0306]. King further teaches that "the camera built into many mobile phones is used to capture an image of the text." A POSA would have thus understood Garcia's mobile phone to include separate software for its digital camera for performing its normal camera operations. Also, as explained for [1b] in Section VI.C.3, Garcia in combination with King teaches downloading a separate app associated with a bank. Because the downloaded app uses Garcia's camera functionality to capture and transmit a bank check, a POSA

would have understood that the bank app at least partially controls the camera software. *See* Sections VI.C.2-VI.C.6;

F. Claim 8: The system of claim 1, wherein the downloaded app manages taking the photo.

113. It is my opinion that Garcia in combination with King (**Ground 1a**) or Garcia in combination with King and Watanabe (**Ground 1b**) renders obvious claim 8.

114. As I explained for [1c] and [1d] (Sections VI.C.4-VI.C.5), Garcia discloses using a built-in camera in a mobile phone to capture an image of a check, and a POSA would have found it obvious to use downloadable software, for example, a downloaded app disclosed in King, associated with the camera to do so. The downloaded app in Garcia-King manages the mobile phone and the customer in capturing images of a check that are suitable for the remote check deposit process. Further, a POSA would have found it obvious to modify the downloaded app to manage taking the photo. *See* Sections VI.C.4-VI.C.5.

G. Claim 9: The system of claim 1, wherein the downloaded app instructs the customer to place the check in front of the digital camera before taking the photo.

115. It is my opinion that Garcia in combination with King (**Ground 1a**) or Garcia in combination with King and Watanabe (**Ground 1b**) renders obvious claim 9.

116. **For Ground 1a**, as I explained for [1c] (Section VI.C.4), Garcia combined with King teaches camera software assisting the customer to take a photo of the check. Garcia discloses “[c]apturing a digital image of the front and the back sides of the document.” Garcia, 10:12-13. King further discloses assisting the customer in capturing images of the document, including displaying a live camera image on the display used as a viewfinder and “overlay[ing] on the live camera image information about the quality of the image and its suitability for OCR, which segments of text are being captured, and even a transcription of the text if the OCR can be performed on the phone.” King, [307]. A POSA would have understood that using the display of the mobile device as a viewfinder to display the live camera image to a user (as disclosed by King) during a check image-capture process (as taught by Garcia) is an instruction to a user to place the check in front of the digital camera before taking the picture, because a live viewfinder display coupled with instruction to capture front and back images intuitively guides a customer to placing the check within the displayed viewfinder frame to achieve the instructed purpose.

117. **For Ground 1b**, as explained for [1c] (Section VI.C.4), Watanabe discloses camera software assisting the customer to take a photo of the check. Garcia discloses “[c]apturing a digital image of the front and the back sides of the document.” Garcia, 10:12-13. Watanabe discloses displaying instructions to a

customer through the guidance frame explained in Sections VI.C.4-VI.C.5, which instructs the customer to properly place the check (e.g., vertical angle of photography) in front of the camera. Watanabe, 12:17-21.

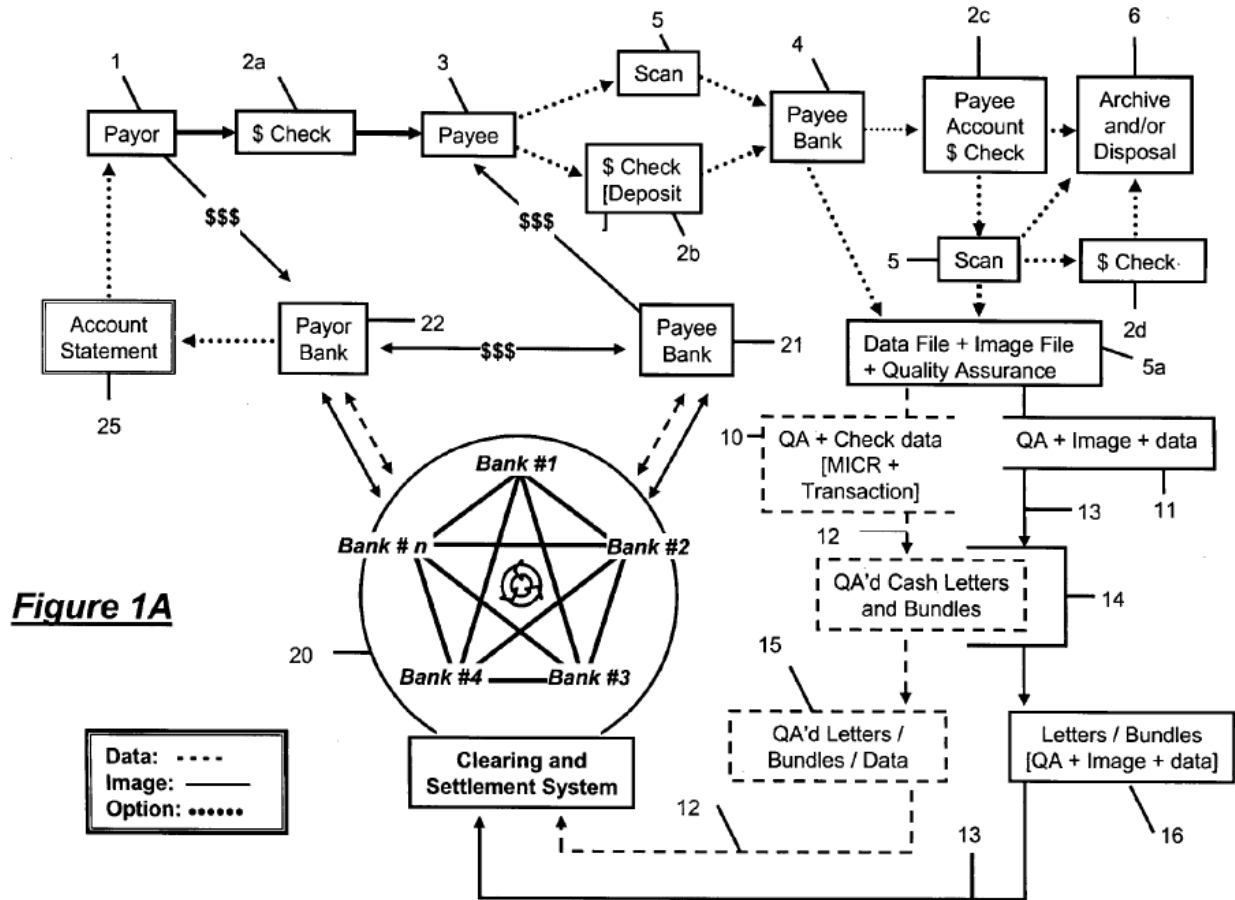
VII. GROUNDS 2a AND 2b: CLAIMS 2-4, 6, 10-14, 16-17, AND 19-20 ARE UNPATENTABLE OVER GARCIA, KING, [WATANABE (2b)], SLATER, AND RANDLE

A. Overview of the Combination

1. Randle

118. Randle teaches a system for electronic end-to-end check processing that can “capture, validate and clear transactions rapidly and inexpensively.”

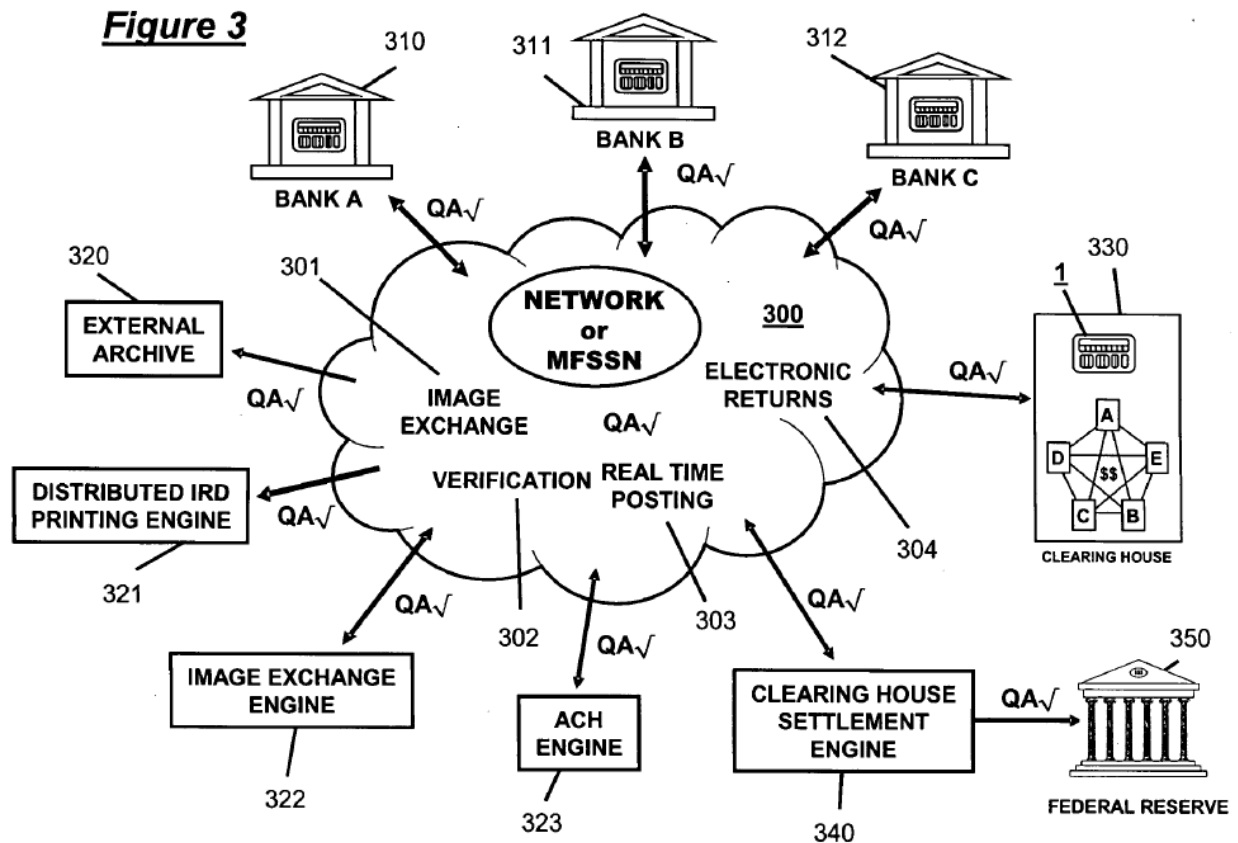
Randle, [0002], [0006]-[0007]; *see also id.*, [0004], [0042]. Figure 1A, reproduced below, illustrates the end-to-end check processing sequence. *Id.*, [0018].



Randle, FIG. 1A.

119. When a payee receives a check from a payor, the payee presents the check to the payee bank either in an electronic form (5) or in a physical form (2b) (which is then scanned). *Id.*, [0019]; FIG. 1A. Subsequently, “[t]he captured data and image information is checked for quality and if found insufficient, the transaction is flagged or routed for exception processing.” *Id.* “Before institutions can perform truncation at the point of capture, the institution must be confident that it has captured a quality assured (QA) image and related data for the check” *Id.*, [0042]. If found sufficient, the payee bank submits the quality-assured

(“QA’d”) check information to the clearing house 20, which then clears and settles the check transaction between the payee bank and the payor banks. *Id.* Figure 3, reproduced below, shows a network connecting multiple banks used in Randle’s system.



Randle, FIG. 3.

120. As part of its validation process, Randle discloses capturing both sides of a check and verifying various information in the check, including “valid account, account standing, valid bank, valid or not a duplicate check number, availability of funds, correct signature, valid positive pay item, and the absence of restrictions such as stop payment orders.” *Id.*, [0019], [0036]. Randle also discloses

verifying whether the check has a correct signature and endorsement on the check.

Id., [0047]. Once verified, Randle discloses that the captured image is converted into a reduced file format, e.g., bi-tonal (black and white) and transmitted to the clearing house, which settles funds between the banks. *Id.*, [0019], [0043], FIG. 1A. The image is transmitted along with “a transaction data file,” which includes “[t]he validation activities and results,” to settlement and clearing. *Id.*, [0019]-[0021].

B. Rationale for Combining Garcia, King, [Watanabe (2b)], Slater, and Randle

121. It is my opinion that a POSA would have been motivated to combine Garcia, King, [Watanabe (2b)], Slater, and Randle.

1. The References are Analogous and Share a Common Architecture

122. Like other asserted references (Section VI.B), Randle is analogous art to the '944 patent including because it is in the same field of endeavor: remote capturing of documents for transmission over the network. Randle discloses capturing an image of a check, transmitting an electronic check image to a bank, which collects the information needed for deposit, checks the data and image information for quality, and processes the data and image “for settlement, payment and clearing.” Randle, [0018]-[0019]. Like the '944 patent, Randle discloses a system comprising a remote capture device at the point of presentment (e.g., “an

image-enabled point of purchase device”), computer equipment at a bank, which are connected via a network. *Id.*, [0006]-[0008].

2. Combining Garcia, King, [Watanabe (2b)], Slater, and Randle

123. In my opinion, a POSA would have been motivated to combine Garcia, King, [Watanabe (2b)], Slater, and Randle to implement various validation and quality control processes associated with the check clearing process. Garcia discloses that its invention relates to, inter alia, “validation and deposit of checks into an existing bank account.” Garcia, 4:13-19. Similarly, Slater discloses validating and verifying the image of the check. Slater, 4:38-5:3. A POSA would have understood that validation is an important part of the check clearing process, and thus, they would have been motivated to look to Randle for implementation details of the validation and verification steps. Given the similarities in their system features and design incentives to improve the accuracy of remote check deposit systems, a POSA would have had a reasonable expectation of success in implementing Randle’s check validation and verification features to further enhance the accuracy and reliability of the Garcia-King-Slater-Watanabe system.

124. In my opinion, a POSA would have been motivated to implement Randle’s duplicate detection to the Garcia-King,-[Watanabe (2b)]-Slater system because it was a ubiquitous feature in remote check deposit systems to ensure that a check is cashed only once. Ex. 1017, 13:41-14:3; Ex. 1018, [0042]. A POSA

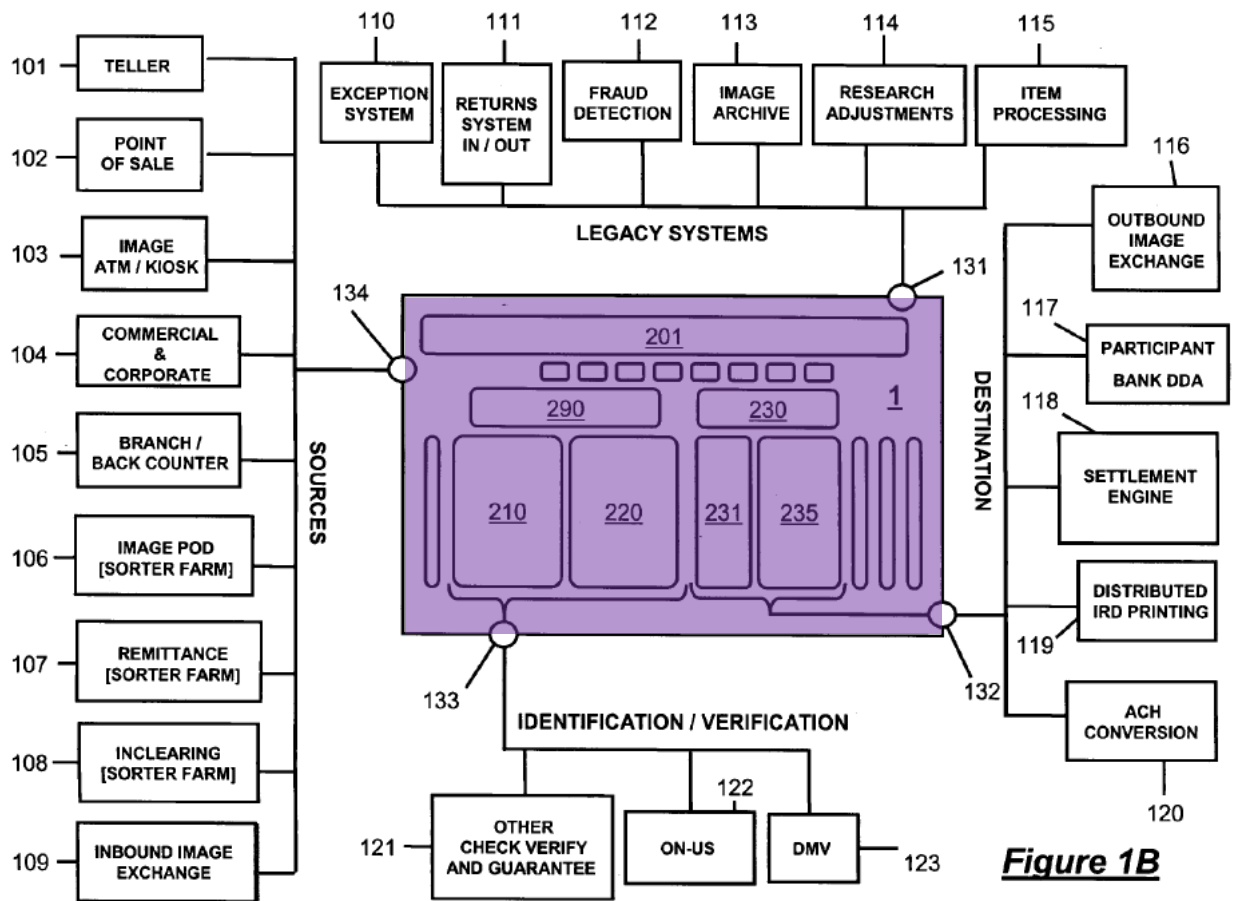
would have been motivated to implement Randle's verification of a signature in an endorsement location of a check to verify that the authorized person endorsed the check. This was a well-known identity verification feature in the art even before the era of remote check deposit. Ex. 1017, Abstract. Also, a POSA would have found it obvious to implement the "data files" disclosed in Randle to the Garcia-King,-[Watanabe (2b)]-Slater system, so that information related to validation and verification of the check is transmitted along with the image of the check to the recipient bank to further enhance the security and accuracy of the remote deposit system. Thus, a POSA would have had a reasonable expectation of success because the combination involves well-known validation and verification elements combined according to known remote check deposit methods to yield predictable results of achieving more accurate check clearing process.

C. Claim 2: The system of claim 1, wherein the bank computer is configured to confirm that mobile deposit of the check can proceed after duplicate detection is performed on the check in the photo.

125. It is my opinion that Garcia in combination with Randle renders obvious claim 2. Garcia discloses a bank computer configured to validate mobile deposit checks, and Randle discloses duplicate detection.

126. Randle's **engine** (item 1 in Figure 1B below) is a system comprising multiple components that mediate transmission, verification, and validation of a check image between a capture device and a bank. Randle, [0020], [0022]. The

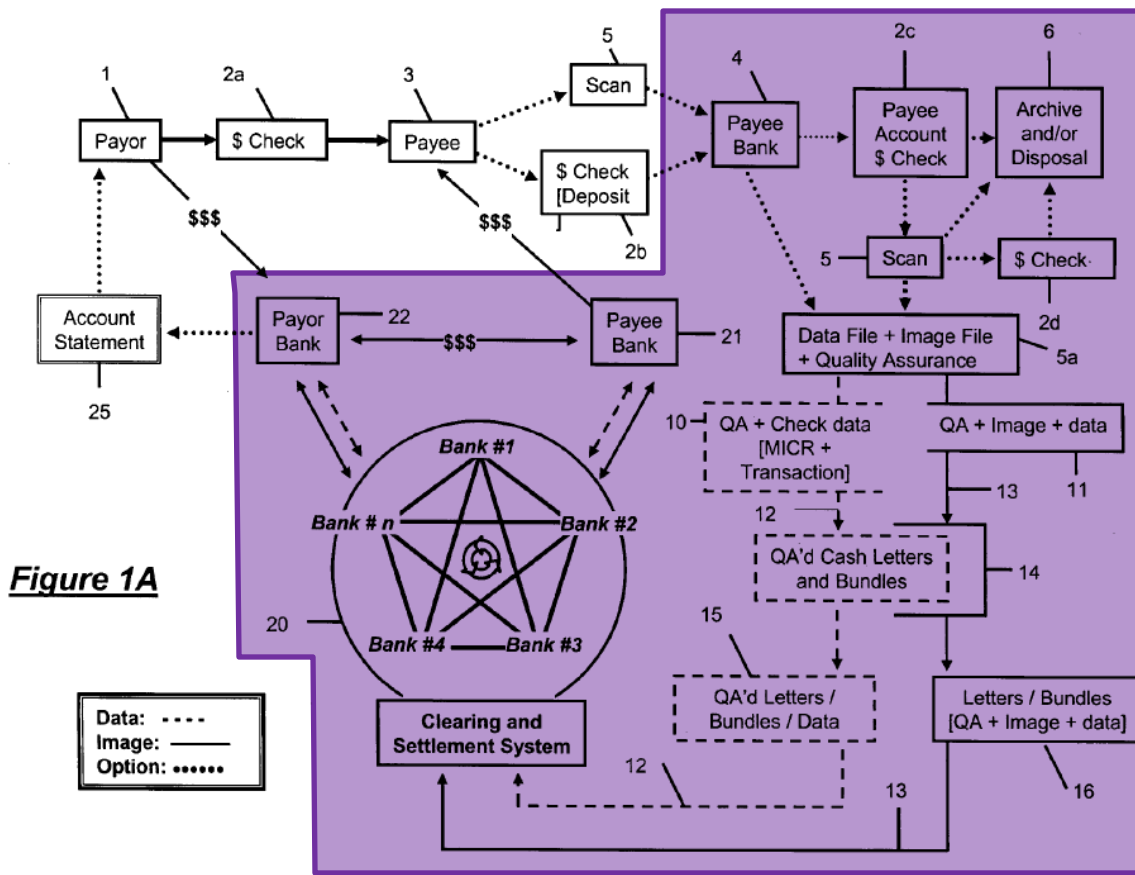
engine includes various modules, such as “an audit trail/real time monitoring and management information module 201,” “[q]uality assurance and transitive quality assurance module 290,” which includes “presenter identification controller 210 and check verification controller 220,” and “[i]mage synchronization module 230,” which includes “231 transit item controller,” and “235 transaction completion controller.” *Id.*, [0054].

**Figure 1B**

Randle, FIG. 1 (annotated with color).

127. The **engine** includes a “[c]heck verification controller 220.” Randle, [0004], [0054]. The check verification controller “is a functional controller that is

used to initiate, control, and monitor the various sub-functions associated with verification of the check being presented.” *Id.*, [0061]. One such sub-function includes a “221 fraud detection suite” for detecting “duplicate transactions.” *Id.*, [0054], [0061]. This quality assurance process is performed to confirm that the mobile deposit of the check disclosed in Garcia (Section VI.A.1) can proceed. *Id.*, [0004]. Randle further discloses that the quality assurance (QA) processes and the check imaging processes (items 5a, 10-16) can be performed by an **engine** that resides in the **payee bank’s computer (items 4, 21)**. Randle, [0020]. A POSA would have found it obvious to implement Randle’s duplicate detection on other banks’ computers involved in the check clearing process to minimize any errors or fraud associated with cashing the same check more than once.



Randle, FIG. 1A (annotated with color).

D. Claim 3: The system of claim 2, wherein the system is configured to initiate the mobile deposit of the check after bank computer confirms that the mobile deposit can proceed.

128. It is my opinion that Garcia in combination with Randle renders obvious claim 3.

129. Randle is directed “to the ultimate settlement and clearing of a check and the transfer of funds associated with the check transaction in a bank to bank or clearinghouse settlement.” Randle, [0002]. As part of the clearing process, Randle’s engine submits the check image to the clearing house 20, which then clears and settles the check transaction between the payee bank (Bank A) and the

payor bank (Bank B) *Id.*, [0019]. “[A]t the time of clearing and settlement, bank to bank funds balances between and among participating banks are settled for the items cleared.” *Id.* Through this process, the payor bank (Bank B) sends the funds to the payee bank (Bank A), as shown below. Accordingly, Bank A’s computer, which includes the engine, “initiate[s] a deposit of funds from a first financial institution to a second financial institution using the digital image in place of the check depicted in the digital image.” *Id.*, FIG. 1A.

E. Claim 4: The system of claim 1, wherein the system is configured to perform the update the balance after it is determined that a mark or signature is present in an endorsement location in the photo of a back side of the check.

130. It is my opinion that Garcia in combination with Randle renders obvious claim 4.

131. As part of its quality assurance process, Randle discloses “signature check (Is it there?), 123 signature validation (Compare to that on file.), 124 endorsement (Is it there?)” Randle, [0047]. A POSA would have found it obvious to look for an endorsement location in the photo of a back side of the check given the well-known configuration of bank checks.

F. Claim 6: The system of claim 1, wherein the system is configured to convert the photo into a bi-tonal Tag Image File Format (TIFF).

132. It is my opinion that Garcia in combination with Randle renders obvious claim 6.

133. Randle discloses converting a check image “to a less size intensive format for transmission and use in the check processing chain,” for example to “bi-tonal (black and white).” Randle, [0043]. A POSA would have understood that the bi-tonal (black and white) image format includes TIFF format because the Federal Reserve banks adopted DTSU X9.37-2003 Format (*i.e.*, a bi-tonal TIFF format) for Check 21 services. Ex. 1019. A POSA would have been motivated to apply Randle’s data reduction to comply with the Check 21 regulation and “increase[] transmission speed and reduce[] storage requirements.” Randle, [0043].

G. Claim 10: The system of claim 1, wherein the system is configured to generate a log file for the mobile deposit of the check, wherein the log file includes an image of the check submitted for mobile deposit of the check.

134. It is my opinion that Garcia combined with Randle renders obvious claim 10.

135. Randle discloses that its system converts a check “into an electronic image and a transaction data file in which image and data file transmission is optimized.” Randle, Abstract. The “transaction data file and coordinated image and data file and QA checkmark 5a, comprising the QA’d data file 10 and the QA’d image plus data file 11 are separately manipulated and processed for settlement, payment and clearing in the paths.” *Id.*, [0019].

H. Claim 11: The system of claim 1, wherein the copy of the photo is a modified version of the photo taken with the digital camera.

136. It is my opinion that Garcia combined with Randle renders obvious claim 11.

137. Randle discloses that the captured image of the check “is converted to a less size intensive format for transmission and use in the check processing chain.” Randle, [0043]. The captured photo is “in an 8 bit gray scale (or color) high dpi format (100 dpi or 200 dpi) . . . to assure a high level of quality for a QA process,” which can be modified to “bi-tonal (black and white)” and “equivalent or similar reductions in tone, color, contrast, resolution or other parameters.” *Id.*

I. Claim 12: The system of claim 11, wherein the copy of the photo has a different format than the photo taken with the digital camera.

138. It is my opinion that Garcia combined with Randle renders obvious claim 12. As I explained for claims 6 and 11 (Sections VII.F, VII.H), the copy of the photo has a different format (e.g., TIFF) than the photo taken with Garcia’s digital camera. It was well known that the preferred file format for photos taken with a mobile device is the JPEG standard. Ex. 1020, [0040]-[0041].

J. Claim 13: The system of claim 1, further comprising a third-party vendor computer.

139. Garcia combined with Randle renders obvious claim 13. Randle discloses “pass[ing] the data and image and the associated digital signature to the central server.” Randle, [0022]; *see also id.*, [0024], [0025]. A POSA would have

understood that the central server may be a third-party vendor computer. Indeed, the '944 patent discloses that “[f]inancial institution 130 may maintain and operate server 131 for the purposes of communicating with customers such as 110,” and “such server may be maintained and operated by one or more third party vendors who act under the instructions of the financial institution 130, but possess skills and resources that may be more effective in competent operation of electronics.” Ex. 1001, 7:18-25. It further states that “[s]uch arrangements are well known in the industry and in this case the server 131 is nonetheless considered to be ‘associated’ with the financial institution 130.” *Id.* at 7:25-28.

K. Claim 14

- 1. [14pre] A system for allowing a customer to deposit a check using a customer’s own handheld mobile device with a digital camera, the system configured to authenticate the customer using data representing a customer fingerprint,**

140. It is my opinion that Garcia combined with Randle renders obvious [14pre]. As explained in [1pre], Garcia discloses a system for allowing a customer to deposit a check using a customer’s own handheld mobile device. Section VI.C.1. Garcia further discloses user verification by “[i]dentifying the device and its relationship to the user, and verifying the associated telephone number and its identification number (IMEI).” Garcia, 10:8-10. Although Garcia does not expressly disclose fingerprint verification, it would have been obvious in view of Randle.

141. Randle discloses that its engine comprises the “presenter identification controller 210,” which monitors “identification of the individual initiating the transaction” by, for example, “storage and retrieval of biometric information such as fingerprints 212 or other biometric data 213 for analysis and comparison.” Randle, [0060]. As explained in Section VI.B, a POSA would have found it obvious to combine Garcia and Randle with a reasonable expectation of success. Further, a POSA would have found it obvious and advantageous to add Randle’s fingerprint authentication to Garcia’s mobile device to improve Garcia’s user verification and security of the remote check deposit process, a well-known consideration in the art at the time. Randle, [0005]-[0006].

2. [14a] the system including: a customer’s handheld mobile device including: camera software that controls the digital camera; and

142. It is my opinion that Garcia in combination with King (**Ground 1a**) or Garcia in combination with King and Watanabe (**Ground 1b**) renders obvious [14a] for the reasons explained for claim 7. Section VI.E.

3. [14b] a downloaded app associated with a bank to control the camera software and to control submitting a check for deposit by causing the customer’s handheld mobile device to perform the following steps:

143. It is my opinion that Garcia in combination with King (**Ground 1a**) or Garcia in combination with King and Watanabe (**Ground 1b**) renders obvious [14b] for the reasons explained for claims [1b] and 7. Sections VI.C.3, VI.E.

4. [14c] instructing the customer to have the digital camera take photos of front and back sides of the check;

144. It is my opinion that Garcia in combination with King (**Ground 1a**) or Garcia in combination with King and Watanabe (**Ground 1b**) renders obvious [14c] for the reasons explained for claim 5. Section VI.D.

5. [14d] using a display of the customer's handheld mobile device to assist the customer in having the digital camera take the photos of the check;

145. It is my opinion that Garcia in combination with King (**Ground 1a**) or Garcia in combination with King and Watanabe (**Ground 1b**) renders obvious [14d] for the reasons explained for [1c]. Section VI.C.4.

6. [14e] assisting the customer as to an orientation for taking the photos;

146. It is my opinion that Garcia combined with Watanabe discloses [14e] for the reasons explained for [1d]. Section VI.C.5.

7. [14f] receiving input from the customer indicating an amount of the check; and

147. It is my opinion that Garcia alone or in combination with King renders obvious [14f] for the reasons explained for [1b]. Section VI.C.3.

8. **[14g] using a wireless cellular network, transmitting a copy of the photos over the Internet from the customer's handheld mobile device and submitting the check for mobile check deposit in the bank after the photos of the check are presented to the customer;**

148. It is my opinion that Garcia in combination with King renders obvious [14g]. As explained in [1e], Garcia discloses using a wireless network, transmitting a copy of the photo over the Internet from the customer's handheld mobile device to the bank. Section VI.C.6. Garcia further discloses presenting the photos of the check to the customer because it teaches "[i]mmediately displaying the digital image of the user" after capturing and transmitting a digital image of the check to a receiving institution. Garcia, 5:23-6:9. Then, the "institution that receives the message proceeds to validate and encrypt [sic] it to obtain a digital photograph of the check and a series of data that enable it to automatically process the deposit of said check into the account of the service user." Garcia, 12:16-21.

9. **[14h] a computer associated with the bank programmed to update a balance of an account to reflect the check submitted for mobile check deposit by the customer's handheld mobile device; and**

149. It is my opinion that Garcia combined with Slater renders obvious [14h] for the reasons explained for [1pre], [1i]. Sections VI.C.1, VI.C.10.

- 10. [14i] the system configured to perform additional steps including: confirming that the mobile check deposit can go forward after optical character recognition is performed on the check, the optical character recognition determining an amount of the check, performing duplicate detection, and comparing the determined amount to the amount indicated by the customer; and**

150. It is my opinion that Garcia combined with Slater and Randle renders obvious [14i]. As explained in [1g], Garcia alone or in combination with Slater discloses performing OCR on the check to determine the amount of the check. Section VI.C.8. As explained in claim 2, Garcia combined with Randle discloses performing duplicate detection. Section VII.C. As explained in [1h], Garcia combined with Slater discloses comparing the determined amount to the amount indicated by the customer. Section VI.C.9.

- 11. [14j] generating a log file for the mobile check deposit, the log file including an image of the check submitted for mobile check deposit.**

151. It is my opinion that Garcia combined with Randle renders obvious [14j] for the reasons explained for claim 10. Section VII.G.

- L. Claim 16: The system of claim 14, wherein the customer's handheld mobile device is a Personal Digital Assistant (PDA).**

152. It is my opinion that Garcia discloses claim 16. Garcia discloses that “[t]he possibility of making payments, billing, or performing other bank account transactions through a mobile telephone or other mobile terminal, such as a PDA, has been described in various documents” Garcia, 2:17-23.

M. Claim 17

1. **[17pre] A system for allowing a customer to deposit a check using a customer's own handheld mobile device, the system including:**

153. It is my opinion that Garcia combined with Randle renders obvious [17pre] for the reasons explained for [14pre]. Section VII.K.1.

2. **[17a] a bank computer programmed to update a balance of an account to reflect an amount of a check submitted for mobile check deposit by the customer's handheld mobile device, the customer's handheld mobile device including a downloaded app, the downloaded app associated with a bank and causing the customer's handheld mobile device to perform:**

154. It is my opinion that Garcia combined with Slater renders obvious [17a] for the reasons explained for [14h], [14b]. Sections VII.K.9, VII.K.3.

3. **[17b] receiving input entered by the customer indicating an amount of the check;**

155. It is my opinion that Garcia alone or in combination with King renders obvious [17b] for the reasons explained for [14f]. Section VII.K.7.

4. **[17c] using a display of the customer's handheld mobile device to assist the customer in having a digital camera take a photo of the check,**

156. It is my opinion that Garcia in combination with King (**Ground 1a**) or Garcia in combination with King and Watanabe (**Ground 1b**) renders obvious [17c] for the reasons explained for [14d]. Section VII.K.5.

5. [17d] assisting the customer as to an orientation for taking the photo, and

157. It is my opinion that Garcia combined with Watanabe renders obvious [17d] for the reasons explained for [14e]. Section VII.K.6.

6. [17e] after taking the photo, using a wireless network, transmitting a copy of the photo over the Internet from the customer's handheld mobile device and submitting the check for mobile check deposit in the bank; and

158. It is my opinion that Garcia in combination with King renders obvious [17e] for the reasons explained for [14g]. Section VII.K.8.

7. [17f] the system being configured to update the balance of the account after optical character recognition reads a Magnetic Ink Character Recognition (MICR) line of the check in the photo.

159. As I explained for [17a] (Section VII.M.2), the Garcia-Randle-King system is configured to update the balance of the account.

160. Randle teaches that “[t]he deposit bank 4 captures the check and related information by a scan 5 . . . and collects information such as the payee name, bank, payee’s account number, the amount of the check and the MICR data.” Randle, [0019]. A POSA would have understood that Randle reads the MICR data optically from the captured check image because that was a standard method of collecting MICR data from a check image. Ex. 1021, [0028] (The apparatus 90 includes an optical character recognition (OCR) reader 92 for optically reading a MICR line from check image data 91 which is representative of

different check image views of the check 10 shown in FIG. 1.”); Ex. 1022, 14:60-63; Ex. 1023, 2:4-11; Garcia, 11:8-18; Ex. 1016, 43-44 (finding that the most reasonable read of Garcia’s disclosure of performing an OCR on the check image is “extracting the MICR line using the OCR.”). Indeed, Randle teaches that OCR is performed on the check number, which was known to be part of the MICR line. Randle, [0074] (“OCR on check number”); Ex. 1021, [0021], FIG. 1. At a minimum, a POSA would have been motivated to OCR read the MICR line in Randle because there was a design need to recognize the MICR data from the check image and applying OCR to a check image to recognize the MICR data was a well-known predictable solution to read the MICR data from a check image.

N. Claim 19: The system of claim 17, wherein the downloaded app manages taking the photo.

161. It is my opinion that Garcia in combination with King (**Ground 1a**) or Garcia in combination with King and Watanabe (**Ground 1b**) renders obvious claim 19 for the reasons explained for [14b]-[14e]. Sections VII.K.3-VII.K.6.

O. Claim 20: The system of claim 17, wherein the system is configured to generate a log file for the mobile check deposit, wherein the log file includes an image of the check submitted for mobile check deposit.

162. It is my opinion that Garcia in combination with Randle renders obvious claim 20. As I explained in [14j], a POSA would have found it obvious to

implement Randle's generation of a log file for mobile check deposit to the Garcia combination. Section VII.K.11.

VIII. GROUND 3a AND 3b: CLAIMS 14-20 ARE UNPATENTABLE OVER KIESSLING, RANDLE, KING, [WATANABE (3b)], AND SLATER

A. Overview of the Combination

1. Kiessling

163. Kiessling discloses “[a] mobile communication device and **a camera module** configured to be attached to a suitable mobile communication device.”

Kiessling, Abstract. As shown in the figures below, the camera module is separable from the mobile device. *Id.*, FIGS. 1-2. Kiessling discloses that the mobile communication devices “may be a mobile telephone, personal digital assistant (PDA) or mobile digital assistant (MDA),” “or any other, including future, mobile communication devices.” *Id.*, [0018]. Kiessling further discloses that the mobile communication devices have a “variety of applications like messaging services, data communication, e-mail or fax services” and can be used “to capture digital photographs or to record digital video clips and, for example, send them to another device . . .” *Id.*, [0002]-[0003]. Kiessling discloses that the “mobile communication device may also include a memory with a stored software program and a microprocessor,” where the “software program and microprocessor can be adapted to control the camera module via the RF connection and to display image

data received from the camera module on a display integrated in the main body of the mobile communication device.” *Id.*, [0028].

FIG. 1

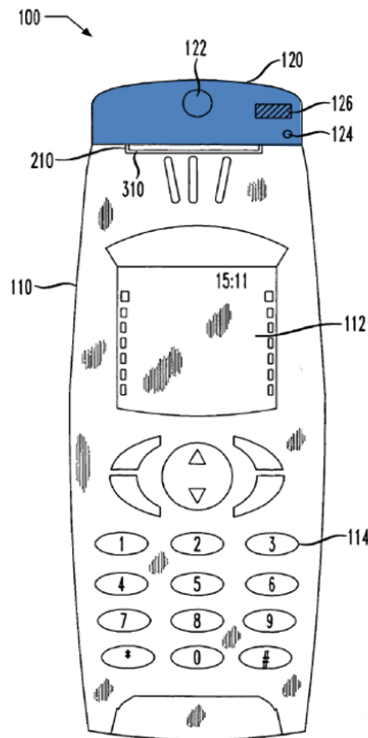
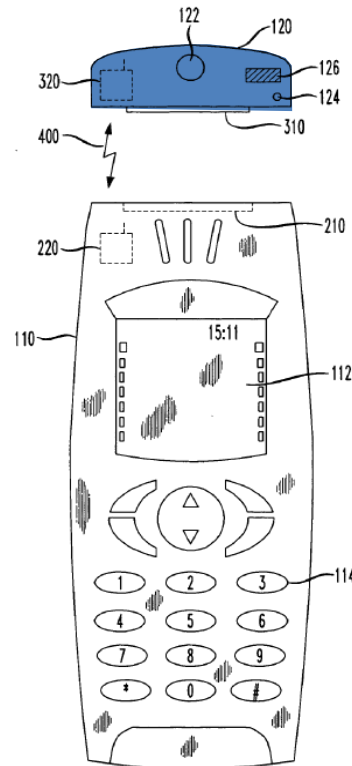


FIG. 2



Kiessling, FIGS 1-2 (annotated with color).

2. Rationale for combining Kiessling, Randle, King, Watanabe, and Slater

164. In my opinion, a POSA would have been motivated to combine Kiessling with Randle, King, Watanabe, and Slater. As explained in Sections VI.B, VII.B, a POSA would have been motivated and found it obvious to combine Randle, King, Watanabe, and Slater including because it was well known to use digital cameras in handheld mobile devices to deposit checks. *See Garcia*, 4:13-19;

Ex. 1018, [0019]-[0022]; Ex. 1013. As shown in Kiessling, a POSA would have recognized that the digital camera in handheld mobile devices can be detachable, so that the digital cameras in the mobile devices “can be used in a more flexible way and that can be easily upgraded.” Kiessling, [0007]. A POSA would have been motivated to implement Kiessling’s detachable digital camera in a handheld mobile device used for remote check deposit so that the digital camera can be easily replaced and upgraded to a better camera (e.g., a higher resolution camera) for more accurate remote check deposit.

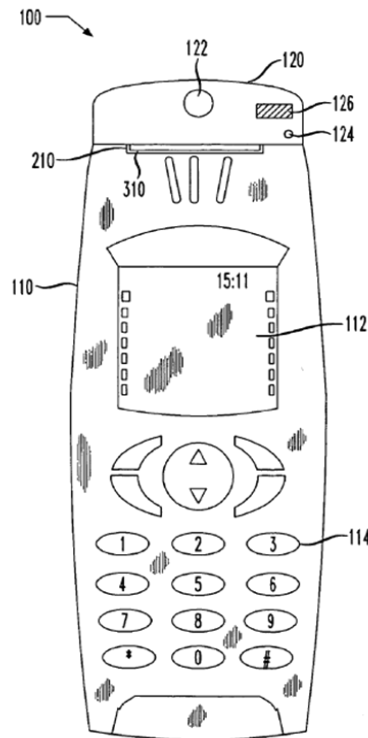
B. Claim 14

1. **[14pre] A system for allowing a customer to deposit a check using a customer’s own handheld mobile device with a digital camera, the system configured to authenticate the customer using data representing a customer fingerprint,**

165. Kiessling combined with Randle renders obvious [14pre]. Kiessling discloses “a mobile communication device, which may be a mobile telephone, personal digital assistant (PDA) or mobile digital assistant (MDA),” including a main body and “a camera module detachable from the main body.” Kiessling, [0018], FIG. 1. As shown in Figure 1 below, Kiessling’s mobile communication devices are handheld devices owned by customers. *Id.* Kiessling discloses that its mobile communication devices can be used for a “variety of applications like messaging services, data communication, e-mail or fax services,” and “capture

digital photographs” and send them to another device, suggesting that they can be used for remotely depositing a check. Kiessling, [0002]-[0003];

FIG. 1



Kiessling, FIG. 1.

166. Randle expressly discloses a remote check deposit system comprising a customer terminal (e.g., point of sale terminal) connected to a bank’s computer. Randle, [0002], [0007], [0020]. Randle’s system includes an engine comprising a “presenter identification controller 210,” which monitors “identification of the individual initiating the transaction” by, for example, “storage and retrieval of biometric information such as fingerprints 212 or other biometric data 213 for analysis and comparison.” *Id.*, [0060]. Given that mobile check deposit was well

known at the time, a POSA would have found it obvious to use Kiessling's mobile device and implement Randle's disclosures on end-to-end check processing to achieve secure and accurate mobile check deposit system. Moreover, a POSA would have been motivated to substitute Randle's point-of-sale devices with customer's mobile device disclosed in Kiessling to provide a direct transaction between a customer and a bank without having to use a retailer's device, which reduces cost and minimizes potential for any error in the check clearing process.

2. [14a] the system including: a customer's handheld mobile device including: camera software that controls the digital camera; and

167. It is my opinion that Kiessling discloses [14a].

168. Kiessling discloses that its mobile communication devices "include a memory with a stored software program," which "can be adapted to control the camera module via the RF connection and to display image data received from the camera module on a display integrated in the main body of the mobile communication device." Kiessling, [0028].

3. [14b] a downloaded app associated with a bank to control the camera software and to control submitting a check for deposit by causing the customer's handheld mobile device to perform the following steps:

169. It is my opinion that Kiessling in combination with Randle and King renders obvious [14b].

170. As I explained for [14a] (Section VIII.B.2), Kiessling's mobile communication device includes camera software that controls the digital camera.

171. As I explained for [1a]-[1b] (Sections VI.C.2-VI.C.3), a POSA would have found it obvious to combine King's downloaded software (i.e., a downloaded app) associated with a bank to implement specific features associated with the remote check deposit process, which were well known at the time. The same obviousness rationales discussed in [1a]-[1b] apply to Kiessling because Garcia and Kiessling both disclose mobile devices, such as mobile phones and PDAs, and a POSA would have recognized that downloading apps to install specific features, such as mobile check deposit features, to such devices was well known in the art. A POSA would have also understood that the downloaded app in Kiessling-King controls submitting a check for deposit by causing the customer's handheld mobile device to perform the steps as discussed below.

4. [14c] instructing the customer to have the digital camera take photos of front and back sides of the check;

172. It is my opinion that Kiessling in combination with Randle and King (**Ground 3a**), or Kiessling in combination with Randle, King, and Watanabe (**Ground 3b**) renders obvious [14c].

173. For **Ground 3a**, Randle further discloses that "[t]he deposit bank 4 captures the check and related information by a scan 5 to create an image of the front and back of the check." Randle, [0019]. As explained for claim 5 (Section

VI.D), King discloses displaying overlay information about the quality of the image and its suitability for OCR on a display of a mobile phone. A POSA would have found it obvious to modify the Kiessling-Randle combination with King to implement displaying instructions on Kiessling's display to take photos of front and back sides of the check.

174. For **Ground 3b**, as I explained for claim 5 (Section VI.D), Kiessling combined with Randle, King, and Watanabe discloses this limitation. Watanabe discloses instructing customers to properly capture a document image, for example, displaying a guidance frame and a message notifying that the angle of photography is not vertical. Watanabe, 12:17-21. A POSA would have found it obvious to modify the Kiessling-Randle-King combination to display Watanabe's message on the display to instruct the customer to have the digital camera take photos of front and back sides of the check because capturing both sides of a check is important for collecting all information about the check for proper validation and verification. Randle, [0019].

5. [14d] using a display of the customer's handheld mobile device to assist the customer in having the digital camera take the photos of the check;

175. It is my opinion that Kiessling in combination with Randle and King (**Ground 3a**), or Kiessling in combination with Randle, King, and Watanabe (**Ground 3b**) renders obvious [14d].

176. For **Ground 3a**, as I explained in [14c] (Section VIII.B.4), a POSA would have found it obvious to modify the Kiessling-Randle combination with King's overlay information to display instructions to assist the customer taking the photos of the check.

177. For **Ground 3b**, as I explained in [14c] (Section VIII.B.4), a POSA would have found it obvious to implement Watanabe's display of instructions in the display of the Kiessling-Randle-King combination to assist the customer taking the photos of the check. For the reasons explained in [1c] (Section VI.C.4), a POSA would have been motivated to provide instructions and feedback on the captured images of the check to ensure that the check is correctly oriented to accurately read the check information.

6. [14e] assisting the customer as to an orientation for taking the photos;

178. It is my opinion that Kiessling in combination with Randle and King (**Ground 3a**), or Kiessling in combination with Randle, King, and Watanabe (**Ground 3b**) renders obvious[14e].

179. For **Ground 3a**, as I explained in [14c]-[14d] (Sections VIII.B.4-VIII.B.5), a POSA would have found it obvious to modify the Kiessling-Randle combination with King's overlay information about the quality of the image and its suitability for OCR. A POSA would have recognized that a proper orientation of

the check image is important for OCR and sought to correct any errors in the orientation at the capturing stage. Ex. 1015, 1:13-32.

180. For **Ground 3b**, as I explained in [14c]-[14d] (Sections VIII.B.4-VIII.B.5), Kiessling in combination with Randle, King, Watanabe renders this limitation obvious. Watanabe discloses assisting the customer as to an orientation for taking the photos, as explained in [1c]. Section VI.C.4. A POSA would have found it obvious to implement this feature in the Kiessling-Randle-King-Watanabe combination for the reasons discussed in [1c]. Section VI.C.4. The same obviousness rationales apply here because, like the Garcia combination, the Kiessling combination discloses using a mobile communication device for remote check deposit.

7. [14f] receiving input from the customer indicating an amount of the check; and

181. It is my opinion that Kiessling in combination with Randle and King renders obvious [14f].

182. Randle discloses collecting “human input amount” as part of its quality assurance path in the remote check deposit process. Randle, [0074]. As explained in [14b], the downloaded app in Kiessling’s mobile communication device causes the device to receive the amount of the check from the customer so that the system has complete information about the check for validation and verification. A POSA would have been motivated to implement this feature

because the check amount is “critical information” of a check that requires proper quality assurance for accurate processing. Randle, [0044]; Doermann.

8. **[14g] using a wireless cellular network, transmitting a copy of the photos over the Internet from the customer’s handheld mobile device and submitting the check for mobile check deposit in the bank after the photos of the check are presented to the customer;**

183. It is my opinion that Kiessling in combination with Randle and King renders obvious [14g]. Kiessling discloses that a customer can send images captured using its mobile communication devices “to another device by means of the well-known multimedia message system (MMS).” Kiessling, [0003]. A POSA would have thus understood that Kiessling’s devices are connected to a wireless cellular network for transmitting photos. *Id.*;

184. Randle discloses that “[t]he captured data and image information is checked for quality and if found insufficient, the transaction is flagged or routed for exception processing,” indicating that the captured photos of the check are presented to the customer before processing. Randle, [0019]. A POSA would have understood that in the Kiessling-Randle-King combination, the photos are presented to the customer on the display of Kiessling’s mobile device. Then, Randle discloses that “the transaction file” including the check image “moves to settlement and clearing,” indicating that the check image is sent to the bank. Randle, [0023]. A POSA would have found it obvious to modify Kiessling’s

devices with Randle's implementation details for remote check deposit because Kiessling's devices are capable of transmitting photos over a cellular network and remote check deposit using mobile devices like those disclosed in Kiessling was well known at the time.

9. **[14h] a computer associated with the bank programmed to update a balance of an account to reflect the check submitted for mobile check deposit by the customer's handheld mobile device; and**

185. It is my opinion that Kiessling in combination with Randle and King renders obvious [14h]. As I explained in [14pre]-[14b], Kiessling-Randle-King discloses a customer using a handheld mobile device to submit photos of a check. Randle discloses that once the check images are verified, "bank to bank funds balances between and among participating banks are settled for the items cleared." Randle, [0019]. Randle further discloses that "[p]ayee bank 21, receiving funds, will assign the funds represented by the financial instrument and credit the funds to the respective individual payee 3." *Id.* A POSA would have understood that a bank's computer updates a balance of an account.

10. **[14i] the system configured to perform additional steps including: confirming that the mobile check deposit can go forward after optical character recognition is performed on the check, the optical character recognition determining an amount of the check, performing duplicate detection, and comparing the determined amount to the amount indicated by the customer; and**

186. It is my opinion that Randle discloses [14i].

187. Randle discloses that its engine captures an “OCR amount” on a check. Randle, [0074], FIG. 9B (item 121); *see also id.*, [0019]. As explained in claim 2, Randle further discloses that its engine performs duplicate detection. Section VII.C. Randle discloses that its engine receives “117 human input amount,” in addition to the “121 OCR amount.” *Id.*, [0074], FIG. 9B. A POSA would have understood that the engine obtains the check amount information in two different ways, so that they can be compared with each other for validation. This was a well-known and common validation feature in remote check deposit systems at the time. *See, e.g.*, Slater, 4:56-5:3. Once the OCR is performed on the check, Randle discloses that the mobile check deposit goes forward to settlement and clearing. Randle, [0021]-[0025].

11. [14j] generating a log file for the mobile check deposit, the log file including an image of the check submitted for mobile check deposit.

188. [14j] is identical to claim 10. Randle discloses [14j] for the reasons explained in claim 10 (Section VII.G). The same obviousness rationales in claim 10 apply to [14j]. A POSA would have found it obvious to replace Garcia with Kiessling in the combination because both disclose well known mobile devices with digital cameras that are capable of capturing images of documents. Sections VI.A.1, VIII.A.1.

C. Claim 15: The system of claim 14, wherein the digital camera is separate from the customer's handheld mobile device.

189. It is my opinion that Kiessling discloses claim 15. Kiessling discloses that its “mobile communication device, which may be a mobile telephone, personal digital assistant (PDA) or mobile digital assistant (MDA)” includes “a camera module detachable from the main body that has an RF transmitter, so that an RF connection between the main body and the camera module can be established and data can be transmitted from the camera module to the main body.” Kiessling, [0018], FIG. 2; *see also id.*, [0036], [0040].

D. Claim 16: The system of claim 14, wherein the customer's handheld mobile device is a Personal Digital Assistant (PDA).

190. It is my opinion that Kiessling discloses claim 16. Kiessling discloses that its “mobile communication device . . . may be a mobile telephone, personal digital assistant (PDA) or mobile digital assistant (MDA).” Kiessling, [0018].

E. Claim 17

1. [17pre] A system for allowing a customer to deposit a check using a customer's own handheld mobile device, the system including:

191. It is my opinion that the combination renders obvious [17pre] for the reasons explained for [14pre]. Section VIII.B.1.

2. **[17a] a bank computer programmed to update a balance of an account to reflect an amount of a check submitted for mobile check deposit by the customer's handheld mobile device, the customer's handheld mobile device including a downloaded app, the downloaded app associated with a bank and causing the customer's handheld mobile device to perform:**

192. It is my opinion that the combination renders obvious [17a] for the reasons explained for [14a]-[14b], [14h]. Sections VIII.B.2-VIII.B.3, VIII.B.9.

3. **[17b] receiving input entered by the customer indicating an amount of the check;**

193. It is my opinion that the combination renders obvious [17b] for the reasons explained for [14f]. Section VIII.B.7.

4. **[17c] using a display of the customer's handheld mobile device to assist the customer in having a digital camera take a photo of the check,**

194. It is my opinion that the combination renders obvious [17c] for the reasons explained for [14d]. Section VIII.B.5.

5. **[17d] assisting the customer as to an orientation for taking the photo, and**

195. It is my opinion that the combination renders obvious [17d] for the reasons explained for [14e]. Section VIII.B.6.

6. **[17e] after taking the photo, using a wireless network, transmitting a copy of the photo over the Internet from the customer's handheld mobile device and submitting the check for mobile check deposit in the bank; and**

196. It is my opinion that the combination renders obvious [17e] for the reasons explained for [14g]. Section VIII.B.8.

7. **[17f] the system being configured to update the balance of the account after optical character recognition reads a Magnetic Ink Character Recognition (MICR) line of the check in the photo.**

197. It is my opinion that Kiessling in combination with Randle and King renders obvious [17f].

198. As I explained for [17a] (Section VIII.E.2), the Kiessling-Randle-King system is configured to update the balance of the account. Randle further teaches performing an OCR to read a MICR line for the check in the photo, as explained in Section VII.M.7.

- F. **Claim 18: The system of claim 17, wherein the digital camera is separate from the customer's handheld mobile device.**

199. It is my opinion that Kiessling discloses claim 18 for the reasons explained for claim 15. Section VIII.C.

- G. **Claim 19: The system of claim 17, wherein the downloaded app manages taking the photo.**

200. It is my opinion that Kiessling in combination with Randle and King (**Ground 3a**), or Kiessling in combination with Randle, King, and Watanabe (**Ground 3b**) renders obvious claim 19. As explained in [14b]-[14e], [17c]-[17d],

the combination discloses using a downloaded app to control Kiessling's camera to capture photos of a check. A POSA would have understood that this includes managing taking the photo because the downloaded app displays instructions for the customer to capture both sides of a check, and images suitable for OCR by, for example, properly orienting the check. Sections VIII.B.3-VIII.B.6, VIII.E.4-VIII.E.5.

H. Claim 20: The system of claim 17, wherein the system is configured to generate a log file for the mobile check deposit, wherein the log file includes an image of the check submitted for mobile check deposit.

201. It is my opinion that Kiessling in combination with Randle renders obvious claim 20. As explained in [14j], a POSA would have found it obvious to implement Randle's generation of a log file for mobile check deposit to the Kiessling combination. Section VIII.B.11.

IX. CONCLUSION

202. For the reasons set forth above, in my opinion, a person of ordinary skill in the art as described above would have considered the Challenged Claims of the '944 Patent to be anticipated by or obvious over the prior art discussed above.

203. In signing this declaration, I understand that the declaration will be filed as evidence in a contested case before the Patent Trial and Appeal Board of the United States Patent and Trademark Office. I acknowledge that I may be subject to cross-examination in this case and that cross-examination will take place within the United States. If cross-examination is required of me, I will appear for cross-examination within the United States during the time allotted for cross-examination.

204. I declare that all statements made herein of my own knowledge are true and that all statements made on information and belief are believed to be true; and further that these statements were made with the knowledge that willful false statements and the like so made are punishable by fine or imprisonment, or both, under Section 1001 of Title 18 of the United States Code.

Dated: April 12, 2023

By: 

David Doermann, Ph.D.