

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. 11,625,770

Filing Date: July 2, 2018

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Case No. IPR2023-01326

DECLARATION OF DR. DAVID DOERMANN

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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. 11,625,770 (“the ’770 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 ’770 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 ’770 Patent.

II. QUALIFICATION

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 (IJ DAR). 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

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

Exhibit #	Description
1001	U.S. Patent No. 11,625,770 (“the ’770 patent”)
1002	Prosecution File History of U.S. Patent No. 11,625,770
1005	WIPO International Publication No. 2005/043857 (“Garcia”)
1006	U.S. Patent Application Publication No. 2006/0026140 (“King”)
1007	U.S. Patent No. 7,027,171 (“Watanabe”)
1008	U.S. Patent Application Publication No. 2005/0036665 (“Higuchi”)
1009	U.S. Patent Publication No. 2006/0249567 (Byrne)
1010	U.S. Patent Publication No. 2006/0077941 (“Alagappan”)
1011	U.S. Patent Application Publication No. 2006/0106717 (“Randle”)
1012	U.S. Patent Application Publication 2005/0097046 (“Singfield”)
1013	Ranjan, Amit, <i>Using a Camera with Windows Mobile 5</i> , developer.com, July 21, 2006, available at https://www.developer.com/mobile/using-a-camera-with-windows-mobile-5/
1014	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)

Exhibit #	Description
1015	<i>PNC Bank N.A. v. United Servs. Auto. Ass’n</i> , IPR2021-01077, Paper 73 (PTAB Jan. 20, 2023)
1016	Order in <i>United Servs. Auto Ass’n v. Truist Bank</i> , No. 2:22-cv-00291, Dkt. 112 (E.D. Tex. June 20, 2023)
1017	<i>PNC Bank N.A. v. United Servs. Auto. Ass’n</i> , IPR2022-00076, Paper 47 (PTAB May 10, 2023)
1018	Sing Li & Jonathan Knudsen, <i>Beginning J2ME: From Novice to Professional</i> , Third Ed. (2005) (“Li”)
1019	Ken Arnold, et al., <i>The Java Programming Language</i> , Fourth Ed. (2005) (“Arnold”)
1020	U.S. Patent Publication No. 2004/0230536 (“Fung”)
1021	U.S. Patent Publication No. 2005/0136949 (“Barnes”)
1022	U.S. Patent Publication No. 2005/0210267 (“Sugano”)
1023	WO2004/04813 with machine translation (“Hitachi”)

IV. RELEVANT LEGAL STANDARDS

15. 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.

16. I have been asked to provide my opinions regarding whether claims 25, 27-28, and 30 (“the Challenged Claims”) of the ’770 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 '770 Patent invention.

17. 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.

18. 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.

19. 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.

20. 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.

21. 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.

22. 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.

23. 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

24. In rendering the opinions set forth in this declaration, I have been asked to consider the ’770 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.

25. I understand that I must evaluate the '770 Patent from the perspective of a person of ordinary skill in the art. That is, the '770 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 '770 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.

26. 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 '770 Patent. Thus, I am familiar with the knowledge of the person of ordinary skill in the art at the time of the '770 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 '770 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

27. 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.

28. 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.

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

30. 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 '770 Patent as it would have been understood by one skilled in the art at the time of the '770 Patent invention. I apply the plain and ordinary meaning of each claim term throughout this declaration.

V. THE CHALLENGED CLAIMS ARE UNPATENTABLE

A. The '770 Patent

31. The '770 patent claims processing a check deposit based on an image of the check transmitted from a remote user device. Such check processing was already well-known before the priority date, October 31, 2006.

32. Claim 25 is directed to a system for remote check deposit comprising a bank computer system connected to a user's computing device via a wireless network. Ex. 1001, Claim 25. Claim 25 predictably recites that the handheld mobile device includes a downloaded app associated with a bank which authenticates a user based on a biometric measurement, instructs a user to capture an image of the check and use a display screen of the user's device to assist the user in capturing the check image. *Id.* It then transmits the photo to a bank over the Internet. *Id.* The biometric measurement is representative of a fingerprint. *Id.*, claim 28. Claim 30 recites a similar method. *Id.*, Claim 30. As further explained below, these were routine and conventional features well-known in the art and reflected nothing inventive.

33. Any additional elements found in the '770 patent claims, such as use of a digital camera separate from the user's computing device or use of a personal

digital assistant (“PDA”) 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 ’770 Patent

34. The ’770 patent purports to describe remote check deposit (“RCD”) including a customer-controlled general-purpose computer 111 and an image capture device 112. ’770 patent, 3:49-60. The customer uses those devices to capture digital check images and to transmit them to a bank computer system. The computer is a desktop or laptop (*id.*, 4:11-12), and the image capture device is a scanner or digital camera (*id.*, 6:40-41).

35. The banking system uses software components to instruct a customer “via a user interface visible on a display” of the customer’s computer to (*id.*, 13:60-61): capture an image of a check (*id.*, 13:63-65); assist the user in having a digital camera capture the image of the check (*id.*, 13:66-14:1); place the check in a certain orientation (*id.*, 14:1-3); and upload the check image to the bank server (*id.*, 14:9-11). The banking system also states the system may authenticate the user with “a customer fingerprint. *Id.*, 10:39-43.

36. Upon receipt of the check image, the bank system performs “Optical Character Recognition (OCR)” of the check image to determine “MICR line information such as routing number, account number, and check number” or “a check amount.” *Id.*, 11:36-40. The system also checks for errors, *id.*, 11:54-12:13,

or verifies the check is properly endorsed, *id.*, 12:23-33. Ultimately, the banking system initiates a deposit of the check into the customer's account. *Id.*, 12:43-44.

2. Prosecution History of the '770 Patent

37. I reviewed the prosecution history of the '770 patent. Ex. 1002. The Applicant filed a preliminary amendment that canceled the original claims and introduced new claims similar to the issued claims of the '770 patent. *Id.*, 1494-1502. The Office issued a non-final office action that rejected all claims under 35 U.S.C. §§ 101 and 102. *Id.*, 1451-1462. The applicant subsequently filed a corrected Application Data Sheet to update the chain of priority for the pending application. *Id.*, 1419-1440. The applicant traversed the prior art rejection under its updated priority claim. *Id.*, 1368. In a final office action, the Office withdrew the prior art rejections in view of the updated priority date information and maintained its rejection of all claims under 35 U.S.C. § 101. *Id.*, 1313-1357. On an appeal, the P.T.A.B. reversed the Examiner's decision rejecting all pending claims under 35 U.S.C. § 101. *Id.*, 130-141.

38. The Office issued a Notice of Allowance after the Board's decision. *Id.*, 47. The Examiner provided a statement of Reason for Allowance that discussed the prior art of record: Singfield (U.S. Patent Publication No. 2005/0097046. *Id.*, 53. The Examiner did not substantively discuss any other prior art when examining the application that became the '770 patent.

B. Grounds of Unpatentability

39. 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 25, 27-28, and 30 of the '770 Patent are rendered obvious to one of ordinary skill in the art.

40. In particular, it is my opinion that claims 25, 27-28, and 30 of the '770 Patent are either anticipated or would have been rendered obvious to one of ordinary skill in the art, based on the grounds shown below:

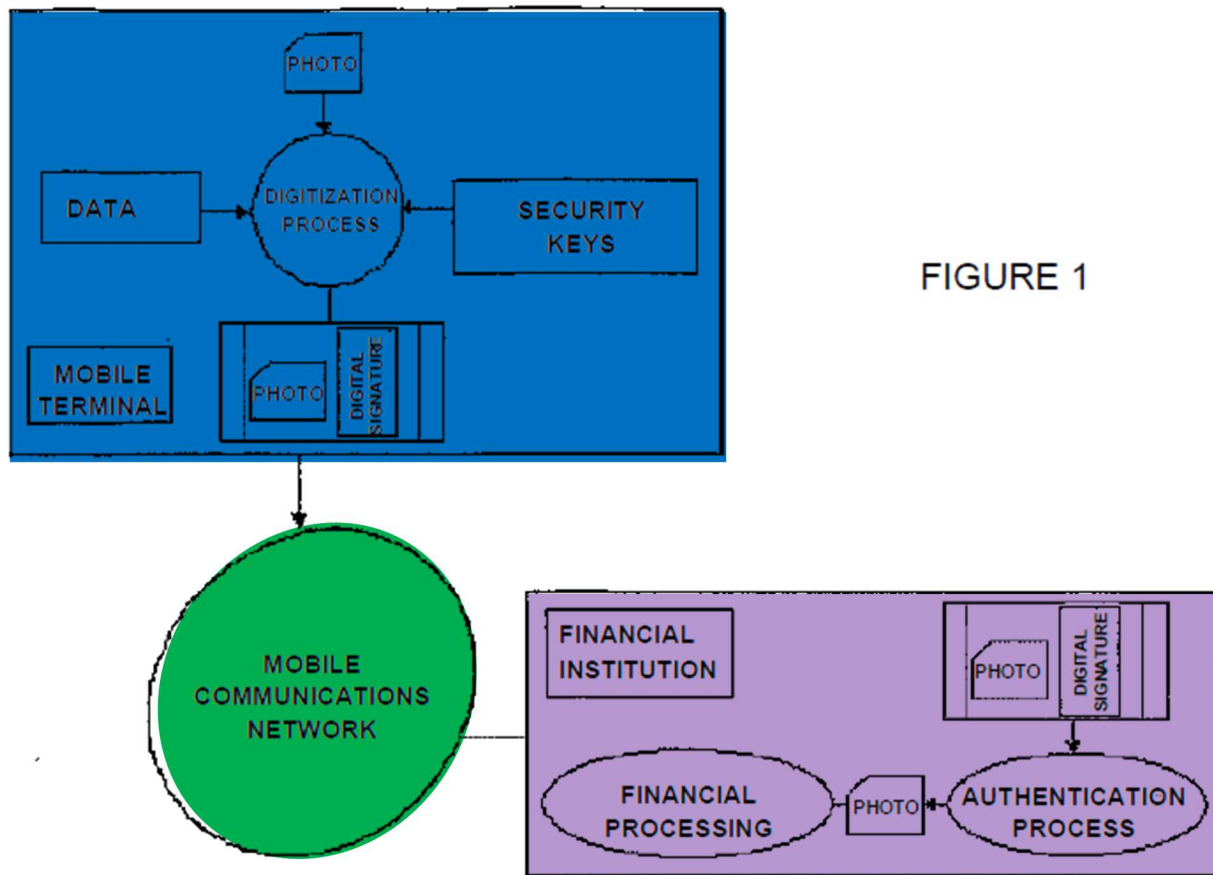
Obviousness Grounds	
Ground 1	Garcia in view of King and Watanabe renders obvious claims 25, 27-28, and 30.
Ground 2	Garcia in view of King and Watanabe and Higuchi renders obvious claims 25, 27-28, and 30.

VI. GROUND 1: CLAIMS 25, 27-28, AND 30 ARE UNPATENTABLE OVER GARCIA IN VIEW OF KING AND WATANABE [AND HIGUCHI (GROUND 2)]**A. Overview of the Combination****1. Garcia**

41. In my opinion, Garcia, King, and Watanabe render obvious claims 25, 27-28, and 30 of the '770 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 (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.

42. 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. Garcia, 11:8-15. The **institution** validates the message and “obtain[s] a digital photograph of the check” and data that “enable[s] it to automatically process the deposit of said check into the account of the service user” by “the usual means (truncating systems).” *Id.*, 11:15-18, 12:16-21.



Garcia, FIG. 1 (annotated).

2. King

43. King discloses document imaging and processing systems 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.*, [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], [0305]-[0308], [0307]

(“the camera built into many mobile phones is used to capture an image of the text”),

FIG. 2:

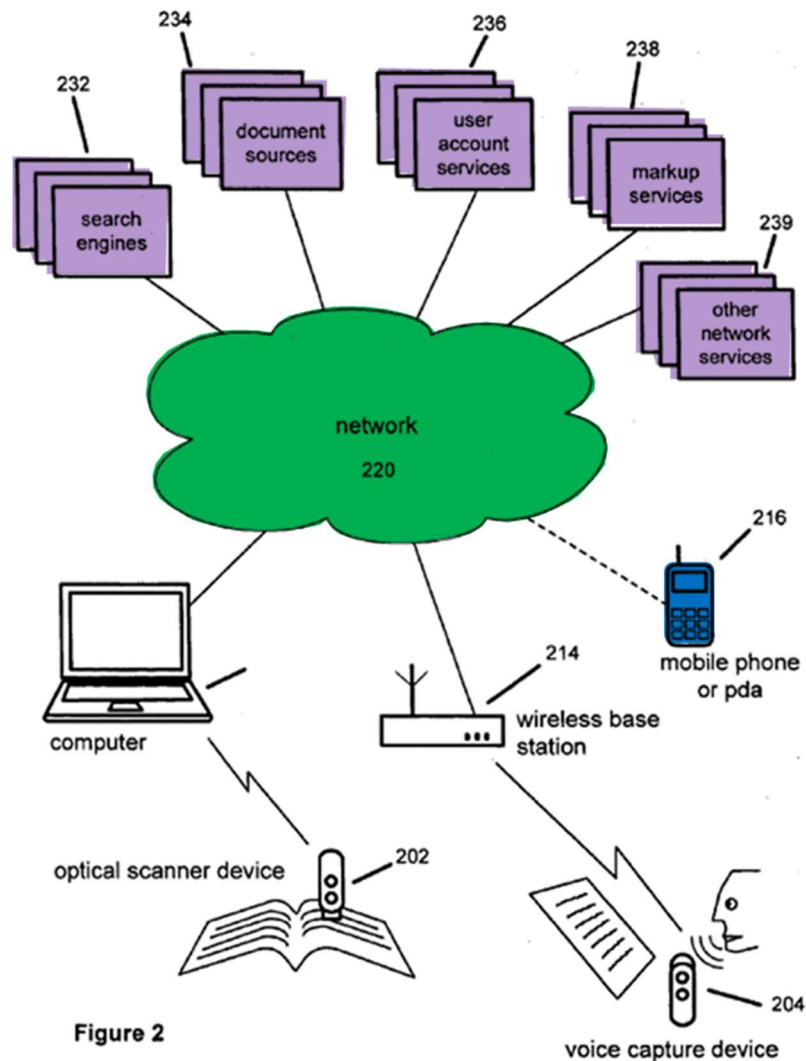


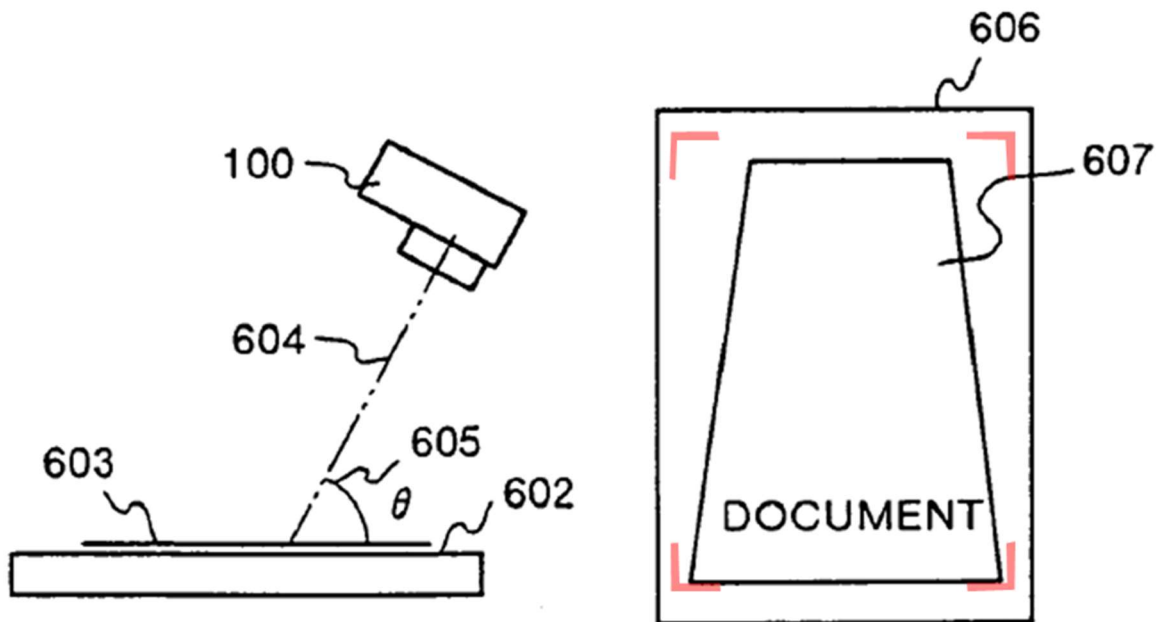
Figure 2

King, FIG. 2 (annotated).

44. 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

45. Watanabe discloses a digital camera for capturing a document image. Watanabe, 1:7-10. The digital camera includes a display that displays a picture of the document and guidance (a guidance frame) to assist the user with properly orienting the document and image capture device and capturing an image suitable for 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 (annotated as disclosed by Watanabe).

4. Ground 2: Higuchi

46. Higuchi discloses authenticating a user for a secure financial transaction using the user's fingerprint captured with a fingerprint input apparatus. Higuchi recognizes that "inputting a fingerprint, rather than a password or other

identifier” is more secure “as computers,” including mobile devices, “are often subject to theft,” Higuchi, [0069]. Higuchi also recognizes other benefits of its design—the “simplicity and compactness of the fingerprint input apparatus permits application to a variety of apparatus and devices” and “use of the fingerprint input apparatus of the invention obviates the need for a PIN or other identifying badge, card or other identifying device.” *Id.*, [0026]. And Higuchi discloses that its “fingerprint input apparatus ... may be used in connection with cellular telephones and personal computers to control use of those apparatuses or devices and for user identification for secure on-line financial transactions.” *Id.*

47. Using a simple fingerprint input apparatus, Higuchi discloses that its fingerprint input apparatus “denotes a two-dimensional image sensor ... for two-dimensionally detecting the light intensity in accordance with the three-dimensional pattern of a skin surface,” which then uses an image processor “to generate a fingerprint pattern” that can be analyzed by an image processor to “recogniz[e] the pattern by comparing the extracted features with a predetermined reference pattern.” *Id.*, [0052].

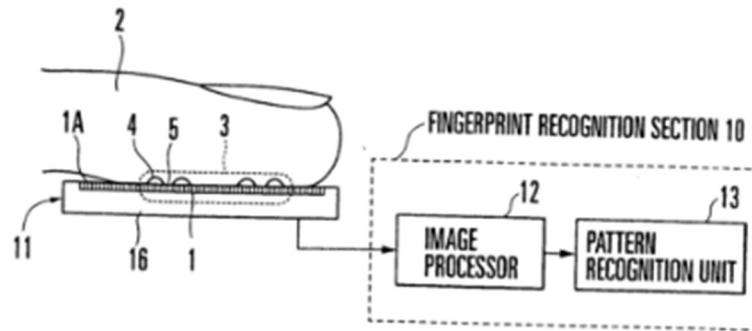


FIG. 1

Higuchi, Fig. 1.

48. Higuchi discloses using this fingerprint input device as a “swipe-type” scanner, specifically configured for use on electronic devices with small surface area, like a cellular telephone. Because Higuchi recognizes that cellular telephones have “very limited areas available” “due to increased miniaturization” and “there typically is not sufficient area on the cellular telephone for an image sensor,” Figure 5 shows the “swipe-type finger print input apparatus 51 [that] is conveniently integrated in the cellular telephone at a position just below the keypad area 53.” *Id.*; Figs. 4-5.

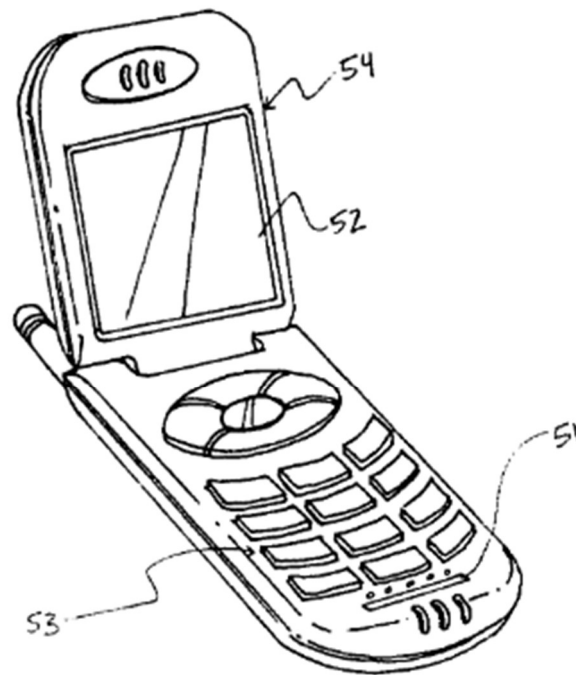


FIGURE 5

Higuchi, Fig. 5.

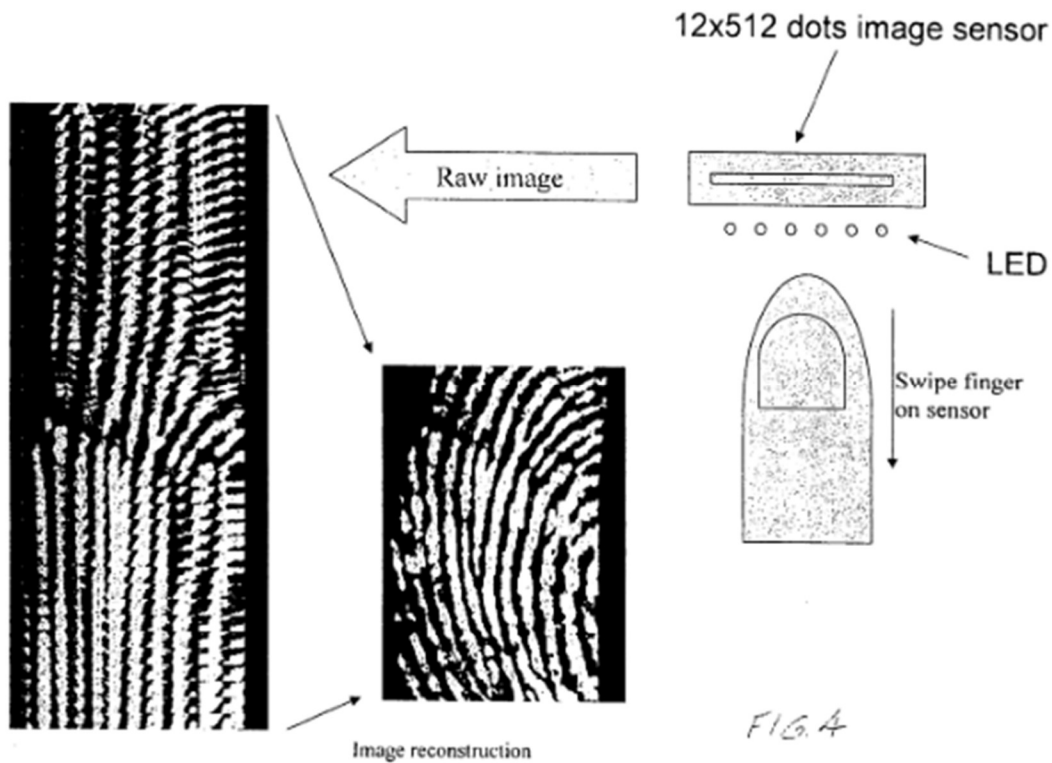


FIG. 4

Higuchi, Fig. 4.

B. Rationale for Combining Garcia, King, and Watanabe

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

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

50. In my opinion, the references are analogous to the '770 patent because they are in the same field of endeavor: electronically capturing documents for transmission over a network. The '770 patent claims capturing a check image with a digital camera in a mobile phone, assisting a customer in taking the check photo, transmitting the photo to the bank to check for 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 a check image, transmitting the image over a 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. Because all references generally disclose electronically capturing images of documents for transmission over a network using well-known components, it is my opinion that a POSA would have found them combinable with a reasonable expectation of success.

2. Combining Garcia, King, and Watanabe

55. Garcia discloses the heart of the ’770 patent, but it does not expressly disclose (1) a downloadable program on a user’s computing device, and (2) assisting a user with capturing check images.

56. **As to the downloadable program**, Garcia discloses a mobile device with an incorporated digital camera to capture check images and transmit them to the bank. Garcia, 4:13-19, 5:8-6:21. Garcia 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. In my opinion, A POSA would have also recognized that software is required to use the camera for capturing a check image for remote deposit purposes.

57. Garcia, however, does not expressly disclose that its software application is downloaded.

58. Garcia provides a handheld mobile device with a computer application but does not expressly explain how the handheld mobile device obtains the computer application. Garcia, 9:19-10:3. Accordingly, a person of ordinary skill in the art would have been motivated to find a solution for distributing the computer application to the handheld mobile device, and a person of ordinary skill in the art would have readily understood that there were well-known ways of doing so

59. In 2005, “[b]anking via mobile phone [was] not new.” Ex. 1014, 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.* King expressly discloses downloading applications, explaining that “modern phones have the ability to download software that could implement some parts of the system.” King, [0306], [0227]. In my opinion, POSAs would have understood that controlling check deposit software using downloaded software was well known in the art at the relevant time. *See e.g.*, Singfield, claims 1, 6, 21; Byrne, [0041]-[0048].

60. One well-known means to implement Garcia’s method via downloaded application was using a “plug-in” application implemented as a “thin-client” “application” that is “distributed to a user’s computing device.” Byrne,

[0013], [0046]-[0047]. A POSA would have understood that a plug-in application is one option for implementing King's downloaded application on the mobile device of Garcia because a plug-in "provide[s] an interface between the user and the enterprise," and were known to be used in conjunction with banking applications such as "allow[ing] a bank customer to ... deposit checks." Byrne, [0041], [0048]; *see also id.*, [0042] ("The spirit and scope of the invention covers any thin client with respect to any enterprise post processing and any type of capturing device and captured data object."). This software is readily downloaded onto Garcia's handheld mobile device to yield the predictable result of providing a computer application on the handheld mobile device. Byrne, [0046], [0047].

61. In my opinion, it would have been obvious to a POSA to implement Garcia's computer application on its mobile telephone as a downloaded application, as taught by King by implementing the functionality of Garcia as a downloaded application, as taught by King, on Garcia's mobile telephone, including as a downloaded plug-in, thin-client application. Garcia, 2:17-23; Byrne, [0013], [0046]-[0048]; Singfield, claims 1, 6, 21. 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 from a mobile device.

62. Furthermore, by 2006 it would have been "trivial for a mobile application developer to access a camera;" thus, a mobile device application would

have had access to and control over a camera driver, using one or more application programming interfaces (APIs) known at the time. Ex. 1013, 1.

63. In my opinion, a POSA would have expected success in implementing Garcia's computer application on the mobile telephone as a downloaded application, taught by King. It was well-known that "the phone hardware is not modified to support the system," and that the software (app) is downloaded to "implement some parts of the system." King, [0306]. Therefore, only minimal routine programming would have been needed to download software to Garcia's mobile terminal, which is a generic mobile phone or PDA already equipped with processing capabilities among other "necessary characteristics and functionalities" for mobile image capture and transmission. Garcia, 11:1-6. Particularly if implemented as a "thin-client," as was known in the art at the time, downloading an application as taught by King to Garcia's mobile phone was known to reduce the burden of supporting "multiple, often back-leveled versions of software," improves "ease and speed of software maintenance," and improves "security." Byrne, [0046]-[0047]. In particular, thin-clients were well-known to be suited for handheld mobile devices. Alagappan, [0003] ("A thin client for wireless use is often implemented to reduce memory and processor requirements for reduced power consumption, size, and cost—while at the same time, conserving wireless communication bandwidth for communication with a server or other devices over a communication channel (often

wireless).”), [0004] (“Examples of such [wireless communication] devices include ‘smart’ cell phones, wireless enabled notebook computers or PDAs, alphanumeric pagers, and many others that are limited only by the imagination.”). To the extent any modification to the programming or software was needed to enable downloading, such modification was well within the skill of a POSA.

64. It was well-known that a thin-client includes an application running on a platform-independent environment such as a Java virtual machine (JVM), and that JVMs, such as Java Platform, Micro Edition (J2ME), were widely available on handheld mobile devices. Li, 21, 28; Arnold, 29, 63. Therefore, a person of ordinary skill in the art would have readily understood that King’s downloaded application would be easily implemented as a thin-client plug-in to be compatible with Garcia’s handheld mobile device.

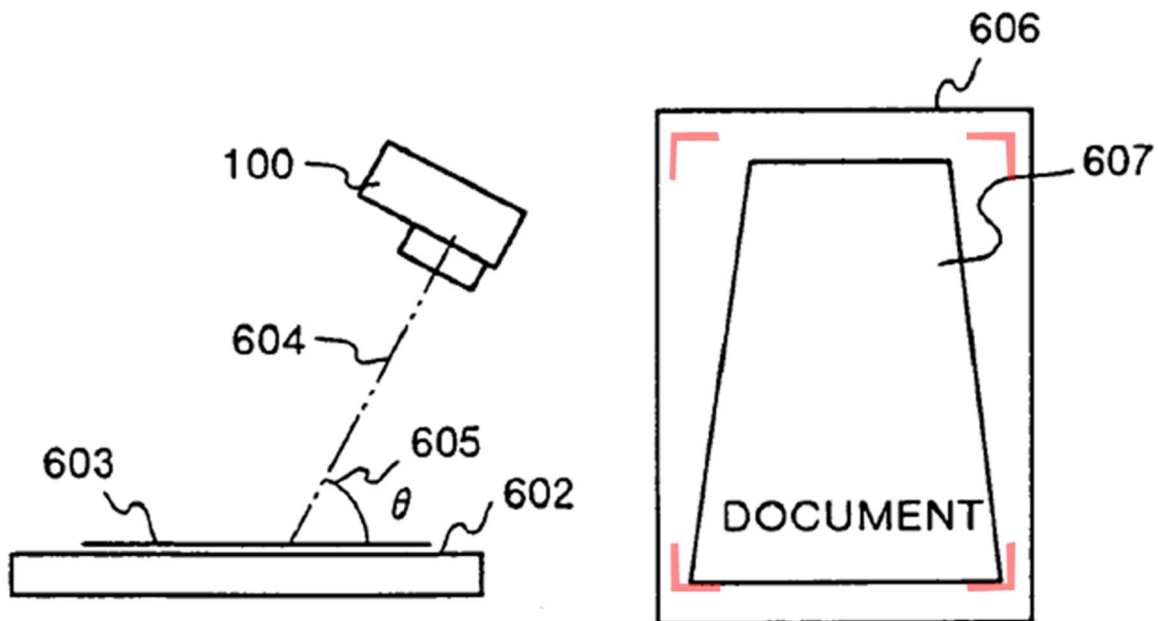
65. When combining Garcia with King’s downloaded application, a person of ordinary skill in the art would have also been motivated by the overall size and maintenance benefits of this approach, as well as synchronizing and reducing the software components in Garcia’s system.

66. In my opinion, it would have also been obvious to try King’s downloaded application in Garcia’s handheld mobile device. There was a design need to fill the gap in Garcia’s disclosure regarding how its computer application is placed on the handheld mobile device. But there were already a finite number of

identified, predictable solutions available to a person of ordinary skill in the art, such as installing the application from media such as CD-ROMs, or electronically downloading the application from the enterprise (e.g., a bank). A person of ordinary skill in the art, therefore, would have had a reasonable expectation of success (and would have succeeded) in placing the computer application on Garcia's handheld mobile device by downloading it from a bank.

67. **As to assisting a user with capturing check images**, in my opinion, a POSA would have been motivated to implement software features within Garcia's mobile device for capturing check images to 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]. A POSA would have recognized the importance of capturing a high-quality check image at the outset to obviate the need for additional quality assurance steps later. Randle [0004]. To this end, a POSA would have been motivated to implement features to assist a customer in capturing a clear check to ensure it is in a proper format for the check clearing process. Watanabe, 1:39-61. A POSA would have recognized that this could be achieved by guiding the customer to properly position the check and camera before capturing the image, so the check processing system will recognize and validate critical information (MICR line and check amount) of the check. Randle, [0057]; Watanabe, 7:55-8:26; Ex. 1016, [0042], [0117]-[0119].

68. In my opinion, a POSA would have readily understood that Watanabe discloses such a feature. Watanabe discloses a digital camera for capturing a document image. Watanabe, 3:9-19. Watanabe's camera displays a guidance frame and messages assisting a customer with achieving an adequate image of the document (angle of photography is vertical). *Id.*, 7:55-8:26. These instructions are displayed until the digital camera recognizes that the document is positioned appropriately for capture. *Id.* A POSA would have had a reasonable expectation of success in adding Watanabe's assistance to Garcia-King because guiding a handheld mobile device user to take photos satisfying quality assurance criteria was well known. Watanabe, 7:55-8:26; Ex. 1016, [0042], [0117]-[0119].



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

69. 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,” like assisting with capturing high-quality images. King, [0306]. A POSA would have recognized that providing guidance for taking a photo is one such feature that could be implemented via downloaded software. The combination would have involved combining known prior art elements (a mobile phone, a downloadable application, and feedback regarding the photographing process) according to known methods (known software development methods for mobile phones) to yield predictable results (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. And, as explained above, it would have been “trivial for a mobile application developer to access a camera;” thus, a mobile device application would have had access to and control over a camera driver, using one or more application programming interfaces (APIs) known at the time. Ex. 1013, 1.

C. Ground 2: Rationale for Adding Higuchi's Fingerprint Scanner and Authentication to the Garcia-King-Watanabe Combination

1. Higuchi Is Analogous Art

70. Higuchi is also analogous to the '770 patent because it solves the same problem: using biometric measurements to authenticate a user for a secure financial transaction. The '770 patent claims authenticating a user based on a biometric measurement obtained corresponding to the user. Ex. 1001, claim 1. Higuchi, similarly, discloses “user identification for secure on-line financial transactions” using a “fingerprint input apparatus” to capture and recognize the user's fingerprint. Higuchi, [0026]; *see also id.*, [0052], [0065].

2. Combining Garcia-King-Watanabe and Higuchi

71. A POSA would have been motivated to combine Garcia, King, and Watanabe for the reasons explained in Section VI.B. A POSA would have additionally been motivated to add Higuchi's fingerprint scanner and authentication to the Garcia-King-Watanabe combination.

72. Garcia already discloses authenticating a user with a unique username and password. *Id.*, 7:1-12, 10:4-6, 16:7-13. A POSA would have been motivated to replace or supplement Garcia's username and password with the fingerprint identification of Higuchi for three reasons: (1) a fingerprint is more secure than a username and password; (2) a fingerprint is more convenient for a user than a

username and password; (3) Higuchi's swipe-style fingerprint scanner would be easily implemented into the mobile device of Garcia to afford the foregoing benefits.

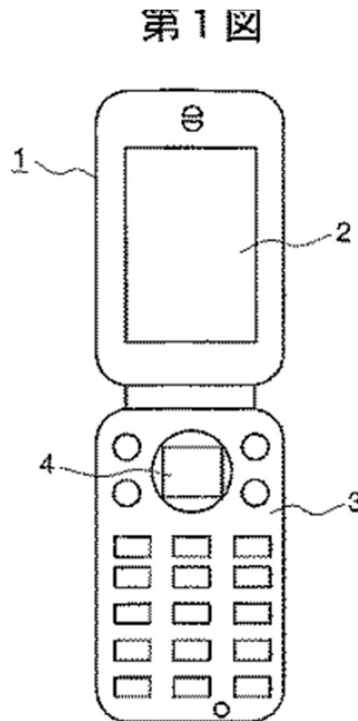
73. **First**, Higuchi recognizes that “inputting a fingerprint, rather than a password or other identifier” is more secure “as computers,” including mobile devices, “are often subject to theft,” Higuchi, [0069]. Moreover, a username and password could be compromised or intercepted by someone wishing to gain access to a secure account, whereas a fingerprint ensures the user wishing to initiate a secure financial transaction is physically present at the device. Fung, [0007] (“However, typical concerns and inconveniences attributed to Such web sites include the financial Security of a user's credit/debit card information while online on Such web sites and the privacy issues relating to online theft of Such confidential information and other fraudulent acts.”); Sugano, [0007] (“[A] simple user authentication technique using a password as conventional ones has a possibility that a password may be stolen by a hacker or a malicious third person, thereby causing a problem that an unauthorized access is difficult to be prevented”)

74. **Second**, Higuchi recognizes that “use of the fingerprint input apparatus of the invention obviates the need for a PIN or other identifying badge, card or other identifying device.” *Id.*, [0026]. This makes the process more convenient for the user by eliminating the need to remember usernames and passwords. Fung, [0006] (“However, due to the numerous personal online accounts

and passwords, which a single user typically generates to access the user's preferred Web Sites, it is often difficult for the user to keep track of and manage the numerous accounts and passwords.”).

75. **Third**, Higuchi’s swipe type scanner would be readily implemented in Garcia’s mobile device, allowing user authentication by fingerprint within Garcia’s system. Higuchi expressly recognizes that the “simplicity and compactness of the fingerprint input apparatus permits application to a variety of apparatus and devices.” Higuchi, [0026]. Higuchi further explains that this method can be implemented using a fingerprint input apparatus connected to or affixed onto a cellular telephone, like the mobile device of Garcia. Higuchi states that its fingerprint input apparatus and method are “particularly advantageous when applied to, for example, a cellular telephone as shown in Fig. 5.” *Id.*, [0065]. And adding a fingerprint scanner to a mobile device was known at the time. Barnes, [0117] (describing a portable mobile device including a fingerprint scanner, stating, “the image module 130 may optionally include hardware and software for receiving and processing fingerprint, iris, or face data used for authenticating the user (e.g., a fingerprint scanner); *see also*, Hitachi (describing and depicting a “portable terminal device with a built-in fingerprint sensor”), Fig. 1. For example, others in the art at the relevant time had developed fingerprint scanners intended to be included in a mobile device, similar to that of Higuchi. One such example is shown in the figure

below, with Fig. 4 depicting the fingerprint scanner on the operation panel of the device:



76. Higuchi discloses a swipe type sensor specifically designed for implementation in tight spaces such as on a small cellular telephone. Higuchi explains:

This basic construction of the fingerprint input apparatus is made smaller by reducing the two-dimensional image sensor in one dimension so as to approach a one-dimensional or line-type sensor wherein the fingerprint is swiped over the sensor and the thus swiped fingerprint is reconstructed.

Higuchi, [0025].

77. And, indeed, Higuchi expressly contemplates incorporating its fingerprint input and authentication functionalities in a generic cellular telephone,

like Garcia's mobile device. *Id.*, [0065] ("Such a telephone typically has a display area 52 and a keypad area 53" and may be a "flip-type" or "other type[] of cellular telephone[]." Because Higuchi recognizes that cellular telephones have "very limited areas available" "due to increased miniaturization" and "there typically is not sufficient area on the cellular telephone for an image sensor," Higuchi's Figure 5 shows the "swipe-type finger print input apparatus 51 [that] is conveniently integrated in the cellular telephone at a position just below the keypad area 53." *Id.*

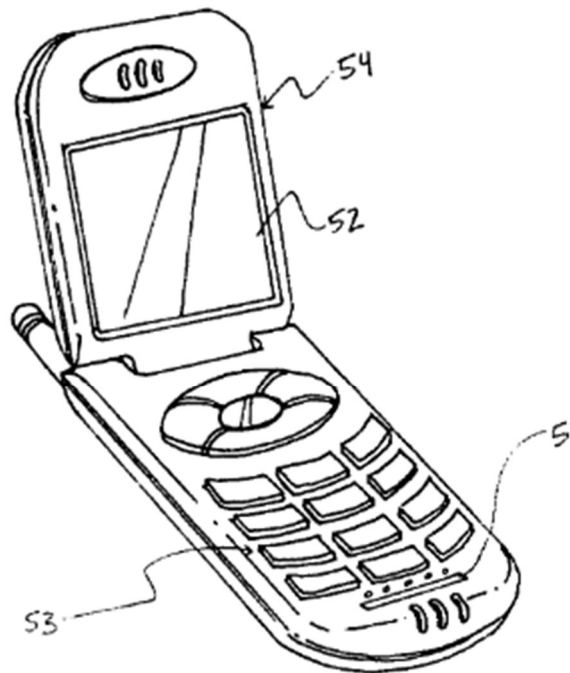
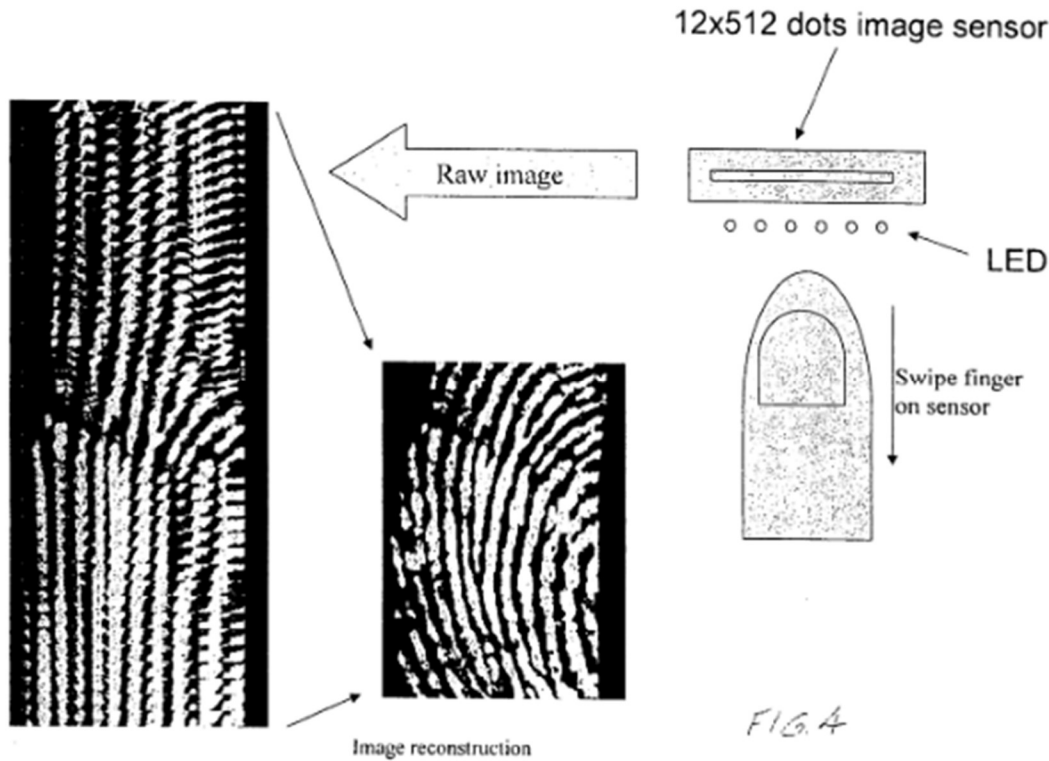


FIGURE 5

Higuchi, Fig. 5.

78. And Higuchi's swipe-style fingerprint input apparatus, implemented on a mobile device, like that of Garcia, would enable authentication using a fingerprint, as shown in Higuchi's Fig. 4.



Higuchi, Fig. 4.

79. Using fingerprints to authenticate a user for a financial transaction was well within the knowledge of a POSA at the relevant time. For example, Randle monitors “identification of the individual initiating the transaction” by “storage and retrieval of biometric information such as fingerprints 212 or other biometric data 213 for analysis and comparison” which demonstrates such techniques were well known. Randle, [0060]. King further shows that biometric, fingerprint authentication was well-known in the art at the relevant time. King discloses authenticating the user using data representing a biometric measurement. King explains “[t]he identity of the user may be determined from ... biometric or other supplemental information (speech patterns, fingerprints, etc.).” King, [0052]. And King further explains that a

user may be authenticated using a “scanner [that] may be used for biometric authentication, for example by scanning the fingerprint of the user.” *Id.*, [0111], [0112], [0297].

80. Because fingerprint authentication using a fingerprint scanner was well-known in the art, a POSA would have readily recognized the benefits of improving Garcia’s system to substitute or supplement its username and password authentication with Higuchi’s fingerprint authentication, including the added security and convenience. Moreover, a user would have had a reasonable expectation of success in implementing Higuchi’s swipe-type fingerprint input apparatus within Garcia’s mobile device because Higuchi’s swipe-type fingerprint scanner specifically contemplates implementation on a cellular telephone like that of Garcia for the exact purpose—authenticating secure on-line financial transactions.

D. Claim 25

- 1. [25pre] A system for allowing a user to deposit a check using the user’s computing device, the system configured to authenticate the user using data representing a biometric measurement, the system including:**

81. Garcia combined with King renders obvious [25pre].

82. Garcia allows a customer to deposit a check using the customer’s handheld mobile device. Garcia discloses a “system” that receives, validates, and deposits 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.

83. Garcia discloses that its system is configured to authenticate the user 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. Garcia also discloses “authentication keys comprising a username and password, [or] a secret number in any format.” *Id.*, 7:1-12, 10:4-6, 16:7-13. Although Garcia does not expressly disclose authenticating a user with a biometric measurement, both King and Higuchi do.

84. King discloses authenticating the user using data representing a biometric measurement. King explains “[t]he identity of the user may be determined from ... biometric or other supplemental information (speech patterns, fingerprints, etc.).” King, [0052]. King authenticates the user with its “scanner [that] may be used for biometric authentication, for example by scanning the fingerprint of the user.” *Id.*, [0111], [0112], [0297].

85. In my opinion, it would have been obvious to a POSA to implement King’s biometric user authentication in Garcia’s RCD process. Garcia suggests various means of authenticating a user are possible when it lists multiple types of authentication keys, and King expressly discloses a known means. A POSA would have been motivated to add fingerprint authentication to Garcia to improve the

security of the remote deposit transaction and to simplify the process for the user by obviating the need for a password or PIN. Higuchi, Abstract, [0026] (“fingerprint ... may be used in place of a personal identification number (PIN) for conducting financial transactions,” and “the use of fingerprint input ... obviates the need for a PIN”). Moreover, use of a fingerprint to authenticate the user increases the security of the system by ensuring that the user requesting authentication is indeed the account owner rather than someone who has acquired the user’s password or PIN without authorization. Higuchi, [0070] (“It is important in many applications to positively identify an individual using a portable device, such as a cellular telephone,” as opposed to simply identifying an individual with the correct password.).

86. In my opinion, a POSA would have been motivated to implement King’s biometric authentication and scanner in Garcia’s system.

87. A POSA would have been motivated to implement a dedicated fingerprint scanner, as taught by King, with Garcia’s mobile device. A POSA would have employed King’s scanner as a fingerprint reader because King’s scanner is a device capable of collecting that data. Higuchi demonstrates that dedicated fingerprint scanning devices that could be implemented within a mobile device or attached to a mobile device, as in Garcia, were well understood by POSAs. Higuchi, Abstract, [0026], Fig. 1. King’s scanner is capable of biometric authentication

through fingerprint scans, King, [0111], and a POSA would have employed such a scanner in communication with Garcia's mobile telephone. Higuchi explains that biometric scanners, such as that of King, were implemented as "integrated in the cellular telephone," like the cellular telephones of Garcia, recognizing that cellular telephones have "limited areas available ... due to increased miniaturization." Higuchi, Fig. 5, [0029], [0065]. In my opinion, a POSA would have understood a dedicated fingerprint scanner as disclosed in King obviated the need for a password and increased security by using user-specific biometrics rather than a password that may be compromised.

88. USAA's '770 patent, for its part, specifies no specialty hardware of its own and merely states that "authentication methods such as requiring a digital certificate, data representing a customer fingerprint, and so forth are also possible." '770 patent, 10:41-43. The '770 patent offers no other disclosure for biometric authentication, and there is no disclosure to indicate that the biometric authentication method adds patentable scope to the claims. As the district court in *United Servs. Auto Ass'n v. Truist Bank*, No. 2:22-cv-00291 recognized, the "claims do not specifically address improvements in how biometric measurements are computed." Ex. 1016, 4. The limited disclosure suggests fingerprint authentication was routine and the implementation of collecting and comparing fingerprint data obvious and within the purview of a POSA. In my opinion, the claims are not novel and non-

obviousness simply for reciting a generic authentication step, used according to its routine function, that was well known in the art at the time.

89. Using fingerprints to authenticate a user before beginning a transaction was well within the knowledge of a POSA. For example, Randle monitors “identification of the individual initiating the transaction” by “storage and retrieval of biometric information such as fingerprints 212 or other biometric data 213 for analysis and comparison.” Randle, [0060]. Higuchi reinforces this understanding, explaining that fingerprint scanning devices “may be used in connection with cellular telephones and personal computers to control use of those apparatuses or devices and for user identification for secure on-line financial transactions.” Higuchi, [0026]. It was similarly well known to employ fingerprint scanning authentication “in place of a personal identification number (PIN) for conducting financial transactions.” *Id.* A POSA would have considered King’s biometric authentication a simple substitution for authentication means such as secret numbers or usernames and passwords as already contemplated by Garcia. A POSA would, therefore, have found it obvious to combine Garcia and King with a reasonable expectation of success, particularly in view of Higuchi’s disclosure of implementing a fingerprint scanner (like that of King) within a mobile device (like that of Garcia). A POSA would have found it obvious and advantageous to add King’s fingerprint authentication to Garcia’s user authentication process to improve

Garcia’s user verification and security for the remote check deposit process, a well-known consideration at the time. King, [0102], [0109], [0111], [0114], [0296], [0298]; Randle, [0005]-[0006]; Higuchi, [0026], [0065], Fig. 5.

90. **For Ground 2**, to the extent necessary, it also would have been obvious to add Higuchi’s fingerprint authentication and fingerprint input apparatus to authenticate the user for a secure financial transaction. Higuchi discloses that a “fingerprint input apparatus ... may be used in connection with cellular telephones and personal computers to control use of those apparatuses or devices and for user identification for secure on-line financial transactions.” Higuchi, [0026]. To authenticate a user with Higuchi’s fingerprint authentication method, Higuchi, unlike the bare disclosure of the ’770 patent, explains in great detail that its fingerprint input apparatus “denotes a two-dimensional image sensor ... for two-dimensionally detecting the light intensity in accordance with the three-dimensional pattern of a skin surface,” which then uses an image processor “to generate a fingerprint pattern” that can be analyzed by an image processor to “recogniz[e] the pattern by comparing the extracted features with a predetermined reference pattern.” *Id.*, [0052].

91. In my opinion, a POSA would have understood that both the two-dimensionally detected light intensity in accordance with the three-dimensional pattern of a skin surface—the user’s fingerprint—and the generated fingerprint

pattern of Higuchi correspond to the claimed biometric measurement. Both these measurements relate to the biometric physical traits of a user—a fingerprint—and are used to authenticate the user.

92. Higuchi further explains that this method can be implemented using a fingerprint input apparatus connected to or affixed onto a cellular telephone, like the mobile device of Garcia. Higuchi states that its fingerprint input apparatus and method are “particularly advantageous when applied to, for example, a cellular telephone as shown in Fig. 5.” *Id.*, [0065].

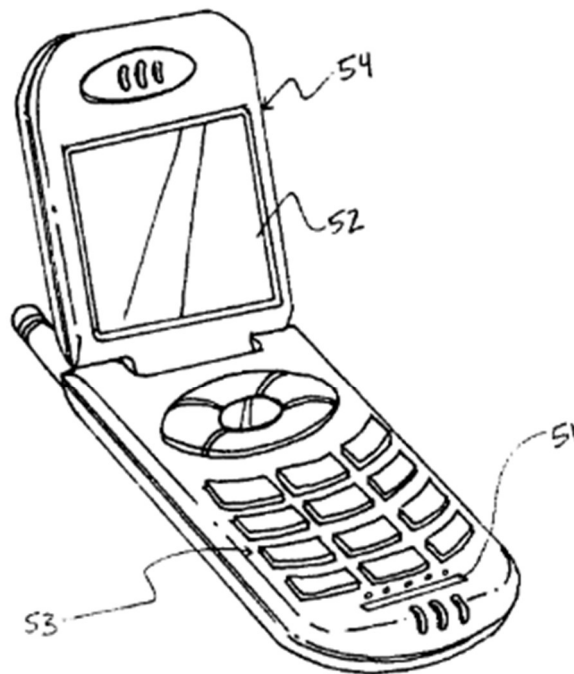


FIGURE 5

Higuchi, Fig. 5.

93. Higuchi expressly contemplates incorporating its fingerprint input and authentication functionalities in a generic cellular telephone, like Garcia’s mobile

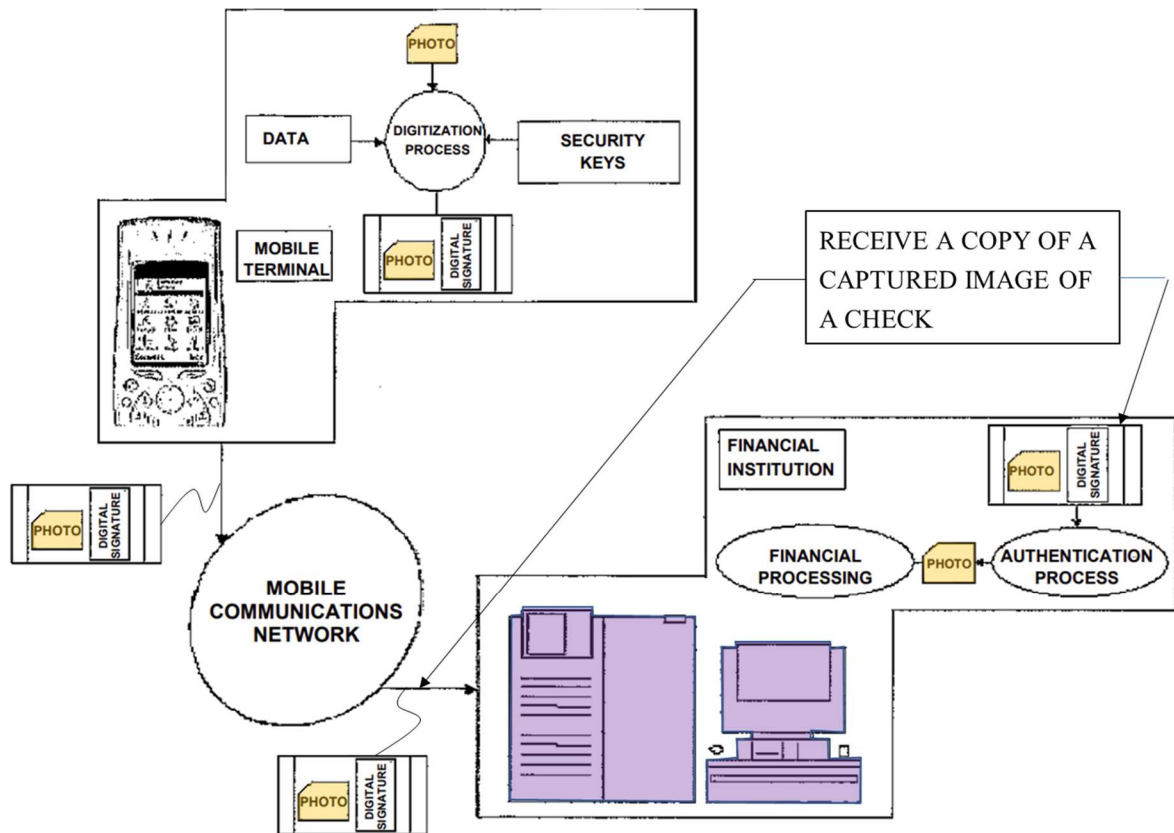
device. *Id.*, [0065] (“Such a telephone typically has a display area 52 and a keypad area 53” and may be a “flip-type” or “other type[] of cellular telephone[].” Because Higuchi recognizes that cellular telephones have “very limited areas available” “due to increased miniaturization” and “there typically is not sufficient area on the cellular telephone for an image sensor,” Figure 5 shows a “swipe-type finger print input apparatus 51 [that] is conveniently integrated in the cellular telephone at a position just below the keypad area 53.” *Id.*

94. In my opinion, a POSA would have been motivated to incorporate Higuchi’s fingerprint input apparatus and authentication method in Garcia’s mobile device because Higuchi expressly teaches and suggests such incorporation for this exact purpose—financial transaction authentication. Section 55 explains further rationales for combining Higuchi into the Garcia-King-Watanabe combination.

2. [25a] a computer system configured to receive a copy of a captured image of a check, process the check by mobile check deposit in a bank, and update a balance of an account based on an amount depicted in the check;

95. In my opinion, Garcia discloses [25a].

96. Garcia discloses **a computer system** at a bank, including “computer equipment connected to the Internet that has an optical character recognition (OCR) system, a code authentication system and means of transmitting data to the institution’s document processing system.” Garcia, 11:8-15. Garcia depicts this computer equipment as either a **server or PC**. Garcia, Fig. 2.



Garcia, Combined Figs. 1 & 2 (annotated).

97. Garcia's banking computer system **receives a copy of a captured image of a check**. Garcia discloses "[c]apturing a digital image of the front and the back sides of [a] document" and "[t]ransmitting the digital image and the recognition data, once encrypted, to the institution that needs to accept the document." *Id.*, 5:23-6:7, 10:12-23; 14:22-15:6. Garcia expressly discloses that the document is a check. *See id.*, 7:18-22, 12:5-10 ("In a preferred embodiment, this method is used to authenticate the payee of a bank check, the original document of which is digitized by means of a mobile device that is equipped with a digital camera capable of

obtaining a digital photograph of one or both sides of the same.”). Garcia employs “mobile equipment that performs the initial capturing, digitizing, and processing” that includes “a mobile telephone equipped with a camera and processing capability.” *Id.*, 11:1-6. Garcia’s mobile device takes “a digital photograph of one or both sides of” the check, collects “identifying data” and “all the data and keys necessary for the operation of the system,” and transmits the data to a receiving institution as a message through a mobile network. *Id.*, 12:5-16.

98. Garcia’s banking computer system **processes the check by mobile check deposit in a bank**. The computer of the receiving institution “receives the message [and] 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.” *Id.*, 8:1-4, 12:16-21, 16:15-19 (emphasis added). In my opinion, a POSA would have understood Garcia’s disclosure of using a mobile telephone to transmit images of a check to a banking institution for processing and depositing the check into the user’s account to be a paradigm example of processing a check by mobile deposit in a bank.

99. Garcia’s banking computer system **updates a balance of an account based on an amount depicted in the check**. Garcia discloses “capturing data associated with the document, such as, for example, the check amount and number.” Garcia, 5:15-21, 10:15-16. The user enters “the check amount, and all the data and

keys necessary for the operation of the system, before sending it,” which the system uses “to automatically process the deposit of said check into the account of the service user.” *Id.*, 12:10-21. Garcia updates a balance of an account when it notifies the user of a successful deposit. After processing the deposit, Garcia notifies the user “whether the operation was successful and, as appropriate, of the status of the transaction performed, whether it was deposited or rejected.” *Id.*, 12:21-13:4. A POSA would have understood Garcia’s method of capturing check amount data and processing the deposit of said check into the user’s account to include updating a balance of an account based on an amount depicted in the check.

100. To the extent the claim requires the system to perform OCR on the image, Garcia teaches it. Garcia discloses an OCR system that is used to “recognize, verify, and electronically process the data sent by the user” and obtain “a series of data that enable it to automatically process the deposit of said check into the account of the service user.” Garcia, 7:18-8:13, 11:7-19, 12:17-21. In an IPR involving a related USAA patent, IPR2021-01077 (“1077 IPR”) 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. 1015, 61-62, 43-44.

3. **[25b] wherein the copy of the captured image is transmitted from a user's computing device configured to execute instructions of a downloadable program stored on a machine-readable medium, the instructions configured to, when executed, cause a processor of the user's computing device to:**

101. In my opinion, Garcia combined with King renders obvious [25b].

102. Garcia discloses that the **copy of the captured image is transmitted from a user's computing device**, disclosing "a mobile telephone equipped with a camera and processing capability" (user computing device). Garcia, 11:5-6. Garcia's mobile telephone "[c]aptur[es] a digital image of the front and the back sides of [a] document" and "[t]ransmit[s] the digital image and the recognition data, once encrypted, to the institution that needs to accept the document." *Id.*, 5:23-6:7; 10:12-23; 14:22-15:6. Garcia's mobile device transmits the captured image "through an internet connection" accessed by "a mobile telecommunications network, for example a GSM/GPRS network." *Id.*, 1:8-14, 11:20-12:3.

103. Garcia discloses that the user's computing device is **configured to execute instructions of a program stored on a machine-readable medium**. Garcia explains that "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, 5:1-12, 9:20-10:2, 14:9-11. Garcia also discloses that its mobile telephone is "equipped with a camera **and processing capability**." Garcia, 11:1-6. Additionally, the mobile device is "equipped with the

technological characteristics necessary to develop” Garcia’s process. *Id.*, Abstract.

In my opinion, a POSA would also have understood Garcia’s disclosure of “processing capability” along with its disclosure of technological characteristics necessary to implement the process of opening a computer application on a mobile telephone to disclose that the mobile phone **executes instructions of a program stored on a machine-readable medium**. The Board similarly found that “Garcia discloses ‘a remote deposit application ... [on] a customer device, wherein the remote deposit application comprises computer-executable instructions that, when executed by a processor,’ perform certain steps. Ex. 1017 (IPR2022-00076, Paper No. 47), 23 (citing Garcia 9:19-10:3).

104. In my opinion, Garcia and the ’770 patent disclose similar types of software applications operating over an internet connection for depositing checks remotely. The ’770 patent discloses using the server 500 to transmit software component 532 to the user’s computer via a network 520, such as the Internet. ’770 patent, 9:4-6, 10:17-19, 10:26-38. It is my opinion that POSAs would have similarly understood Garcia’s “computer application” conducting an “interactive session” “through an internet connection” as like disclosure.

105. Garcia, however, does not expressly disclose that its software application is downloaded. As the Board recognized in IPR2022-00076, “Garcia states that the mobile phone includes a ‘computer application,’ but it does not specify

the type of computer application or how the mobile device acquired it.” Ex. 1017, 24 (citing Garcia, 9:19-10:3). Garcia’s lack of express details on the type of application and how it is received by the mobile phone would have motivated combination with references supplying those details, as the Board previously found. And it was well known to download applications for banking from a mobile device. In 2005, “[b]anking via mobile phone [was] not new.” Ex. 1014, 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.* For example, King discloses downloading applications. 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]. In my opinion, POSAs would have understood that controlling check deposit software 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. Singfield, claims 1, 6, 21.

106. To the extent an express combination is required, it is my opinion that it would have been obvious to a POSA to implement Garcia’s computer application on its mobile telephone as a downloaded application, as taught by King. The

combination would have merely installed King's downloaded software on Garcia's mobile telephone. 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. Similar to the Board's earlier finding in IPR2022-00076, that "Garcia states that the mobile phone includes a 'computer application,' but it does not specify the type of computer application or how the mobile device acquired it" (Ex. 1017, 24 (citing Garcia, 9:19-10:3)), "an ordinary artisan would have been motivated to use techniques known in the art to supply these missing implementation details" (*Id.*, 24-25), such as those taught by King.

107. A POSA would have expected success in implementing Garcia's computer application on the mobile telephone as a downloaded application, taught by King. Only minimal routine programming would have been needed to download software to Garcia's mobile terminal, which is a generic mobile phone or PDA already equipped with processing capabilities among other "necessary characteristics and functionalities" for mobile image capture and transmission. Garcia, 11:1-6. To the extent any modification to the programming or software was needed to enable downloading, such modification was well within the skill of a POSA.

4. [25c] authenticate a user based on the biometric measurement obtained corresponding to the user;

108. In my opinion, the combination of Garcia, King, and Higuchi (Ground 2) renders obvious [25c] as explained for [25pre]. Section VI.D.1.

109. Garcia discloses authenticating a user 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. It also discloses “authentication keys comprising a username and password, [or] a secret number in any format.” *Id.*, 7:1-12, 10:4-6, 16:7-13. Garcia’s system includes “means to recognize, verify, and electronically process the data sent by the user,” including “a key authentication system.” Garcia, 11:8-18. King discloses authenticating the user using the user’s fingerprints, which are data representing a biometric measurement. King, [0052], [0111], [0112], [0297].

110. In my opinion, a POSA would have been motivated to implement King’s biometric data as a simple substitution for Garcia’s user authentication, as explained in Section VI.D.1.

111. **For Ground 2**, to the extent necessary (and as also explained for [25pre]), Higuchi discloses fingerprint authentication to authenticate the user for a secure financial transaction. Higuchi discloses using a “fingerprint input apparatus ... in connection with cellular telephones and personal computers to control use of those apparatuses or devices and for user identification for secure on-line financial

transactions.” Higuchi, [0026]; *see also id.*, [0052], [0065]. To authenticate a user, Higuchi discloses “generat[ing] a fingerprint pattern” from a fingerprint scan captured on a cellular telephone and “recognizing the pattern by comparing the extracted features with a predetermined reference pattern.” *Id.*, [0052]; *see also id.*, [0065].

112. Higuchi further explains that this method can be implemented using a fingerprint input apparatus connected to or affixed to a cellular telephone, like the mobile device of Garcia. Hugchi states that its fingerprint input apparatus and method are “particularly advantageous when applied to, for example, a cellular telephone as shown in Fig. 5.” *Id.*, [0065].

113. In my opinion, a POSA would have been motivated to incorporate Higuchi’s fingerprint input apparatus and authentication method into Garcia’s mobile device because Higuchi expressly teaches and suggests such incorporation for this exact purpose—financial transaction authentication. Section 55 explains further rationale for combining Higuchi into the Garcia-King-Watanabe combination.

5. [25d] instruct the user to capture an image of a check;

114. In my opinion, Garcia in combination with King renders obvious [25d].

115. Garcia discloses that “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, 9:20-10:2. Using this application, Garcia discloses “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; *id.*, 11:1-6. The captured and transmitted images include “a digital image of the front and the back sides of the document.” *Id.*, 10:12-13. Garcia’s handheld mobile device also includes a display. *Id.*, FIG. 2, 6:9, 8:7-10, 15:8.

116. While Garcia suggests instructing a user to capture check images, explaining that it was known to “display menus and forms from a given institution to conduct business-related transactions through them,” Garcia, 3:5-7, King expressly discloses using a display of a customer’s handheld device to instruct 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, and thereby instruct, the customer to capture the check images, 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, it is my opinion that a POSA would have understood that King discloses using the mobile device display to instruct a customer to take a photo of a document using the built-in digital camera. Based on this displayed instruction, a user would have understood how to capture an image of the document. Further, it is my opinion that a POSA would have found it obvious to use the overlay information to display instructions for the customer to capture check images with the digital camera, ensuring the customer understood how to capture the check images.

6. [25e] use a display screen of the user’s computing device to assist the user in capturing the image of the check; and

117. While limitation [25d] requires “instruct[ing],” [25e] requires “assist[ing].” To the extent this limitation requires more than the instruction for [25d], Garcia in combination with King renders it obvious.

118. 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; *id.*, 11:1-6. Garcia’s handheld mobile device also includes a display. *Id.*, FIG. 2, 6:9, 8:7-10, 15:8.

119. 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 discloses 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 for the live camera image in the viewfinder, a POSA would have understood that King discloses using the mobile device display to assist—more than simply instruct—a customer with taking a photo of a document using the built-in digital camera because the user would receive specific feedback regarding the positioning of the document in the photo and its suitability for OCR to assist the user with capturing a sufficient image. King also assists the user with an “electronic help menu[]” that “is presented on [the] display.” King, [0354]. King displays the help menu “when a user scans text from a certain portion of the document.” *Id.* A POSA would have understood King’s electronic help menu as further assisting the user in having a digital camera capture the image of the check because the help menu would be displayed when minimums for “the quality of the image and its suitability for OCR” were not met. *Id.*, [0307].

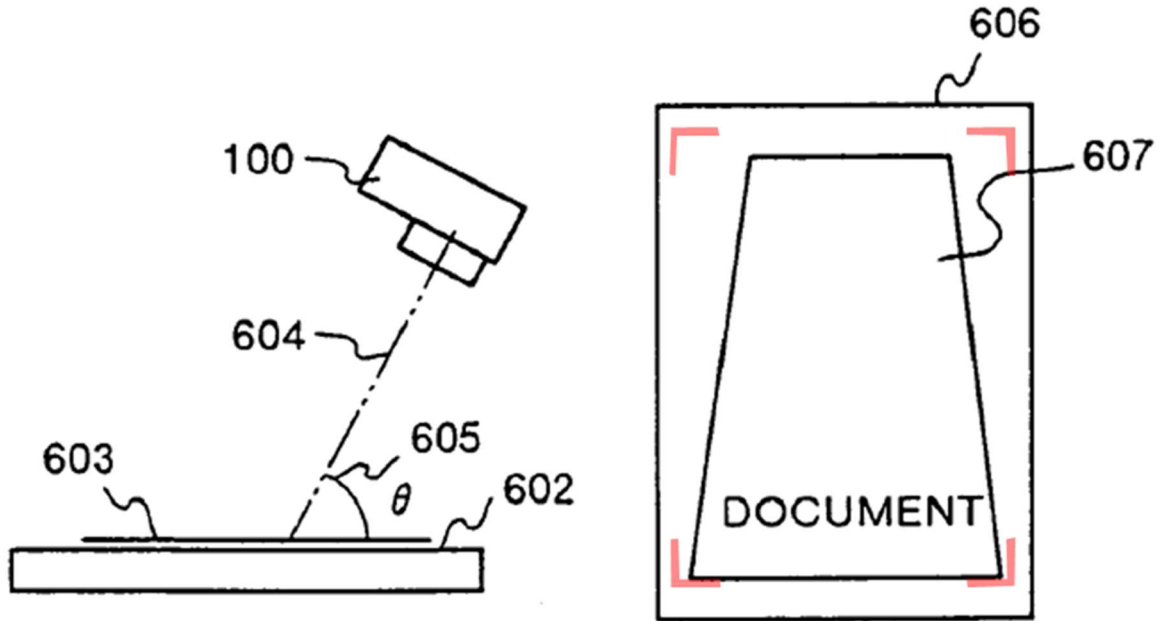
120. In my opinion, a POSA would have been motivated to modify Garcia’s display to add King’s overlay feature in the viewfinder. Because Garcia discloses capturing a check image for OCR, a POSA would have found it advantageous to add King’s display showing an overlay of the image visible in a

viewfinder to enable a user to properly position the check within the viewfinder to ensure capture of the complete and focused check image. *Id.* A POSA would have found the combination obvious because it involves combining prior art elements (capturing an image using a mobile phone, with displaying an overlay image of the live camera image on the display of the mobile phone) according to known methods (e.g., a digital camera displaying a preview image on its screen) to yield predictable results (assist the customer to capture a check image suitable for processing). *Id.* 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. *Id.*

121. To the extent Patent Owner argues that King's overlay does not satisfy this limitation, Watanabe discloses it by displaying a guidance frame on a display screen to assist a user with capturing an a clear image. 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 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 tilts the camera while visually inspecting whether the shape of the document is rectangular like the guidance frame (red), because the displayed image

“changes seamlessly in association with inclinations of the digital camera.”

Watanabe, 7:64-67.

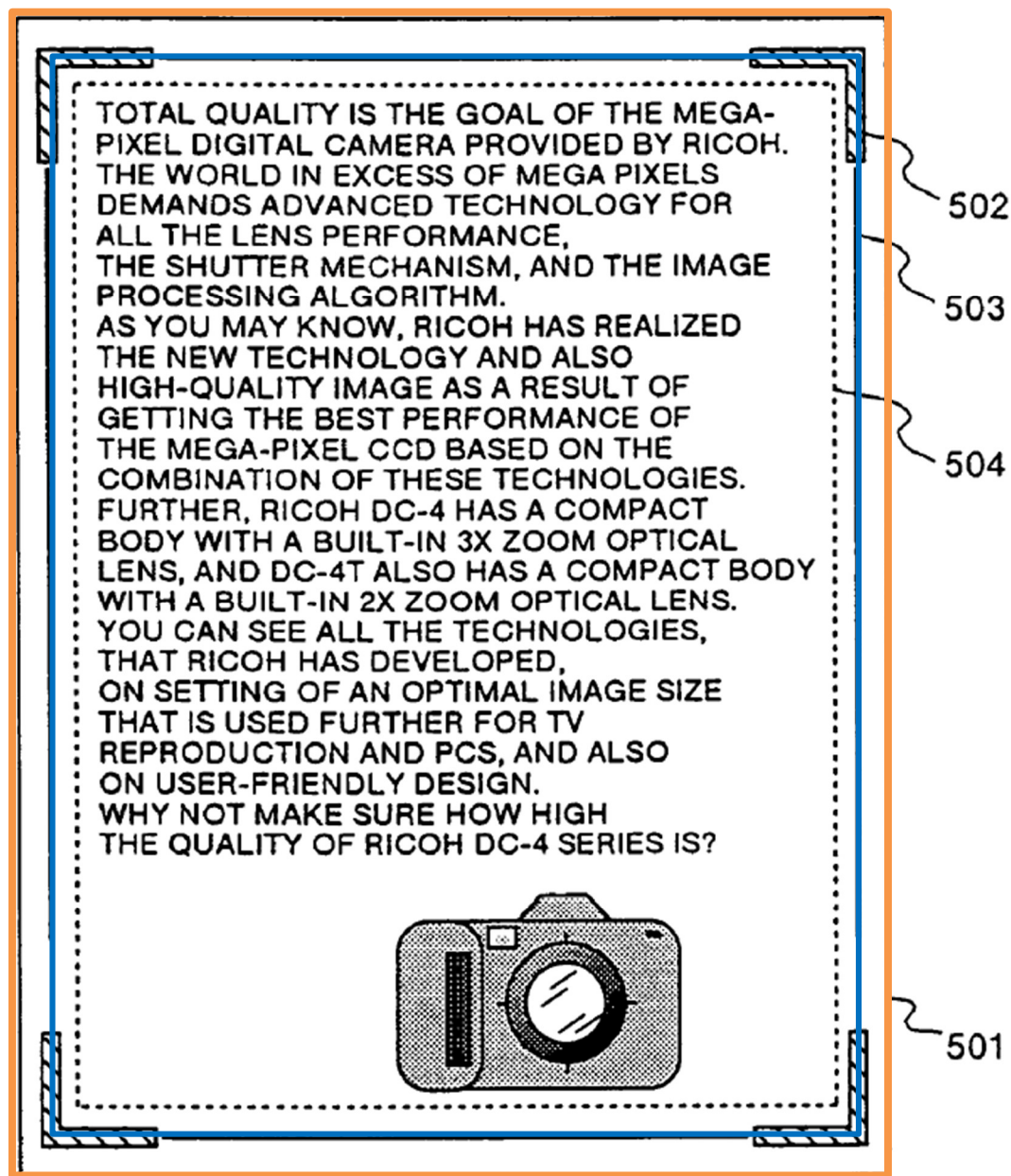


Watanabe, FIG. 5B (annotated as disclosed by Watanabe).

122. 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, its width or length is not parallel to the document (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.

123. In my opinion, a POSA would have understood that as combined, the downloaded app in Garcia’s mobile phone causes display of Watanabe’s guidance

frame to assist the user with capturing an adequate image of the check. Garcia's app then monitors the displayed image and determines whether it comports with image quality control criteria, such as the shape of the document, or whether the image contains distortion. Watanabe, 12:1-31. If the app determines that the image does not meet the quality control criteria, Garcia's mobile device will display additional guidance to assist the customer with capturing the image of the check. Watanabe, 12:1-31.



Watanabe, FIG. 4 (annotated).

124. As explained in Section VI.B, a POSA would have been motivated to implement Watanabe's use of a display screen to assist with capturing the image of the check image in Garcia-King's mobile phone with a downloaded app to ensure the check is adequately captured for accurate OCR.

7. **[25f] use a wireless network to transmit a copy of the captured image from the user's computing device to the computer system.**

125. In my opinion, Garcia discloses [25f].

126. As explained for [25b], Garcia discloses that the copy of the captured image is transmitted from a user's computing device to the computer system. 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, 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 place 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.

E. Claim 27: The system of claim 25, wherein the user's computing device is a PDA.

127. In my opinion, Garcia in combination with King and Watanabe renders obvious claim 27. Garcia discloses a mobile terminal as explained for [25b] (Section **Error! Reference source not found.**), and Garcia further discloses that its mobile terminal may be a PDA, stating, “[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.

F. Claim 28: wherein the biometric measurement is representative of a fingerprint.

128. In my opinion, the combination of Garcia, King, and Higuchi (Ground 2) renders obvious claim 28 as explained for [25pre] and [25c] because King discloses the biometric measurement being representative of a fingerprint, where King authenticates the user by “scanning the fingerprint of the user.” *Id.*, [0111], [0112], [0297].

129. It is my opinion that a POSA would have been motivated to implement King's biometric data as a simple substitution for Garcia's user authentication, as explained in Section VI.D.1.

130. **For Ground 2**, to the extent necessary (and as also explained for [25pre], Higuchi discloses fingerprint authentication to authenticate the user for a

secure financial transaction. Higuchi discloses using a “fingerprint input apparatus ... in connection with cellular telephones and personal computers to control use of those apparatuses or devices and for user identification for secure on-line financial transactions.” Higuchi, [0026]; *see also id.*, [0052], [0065]. To authenticate a user Higuchi discloses that a fingerprint input apparatus “denotes a two-dimensional image sensor ... for two-dimensionally detecting the light intensity in accordance with the three-dimensional pattern of a skin surface,” which then uses an image processor “to generate a fingerprint pattern” that can be analyzed by an image processor to “recogniz[e] the pattern by comparing the extracted features with a predetermined reference pattern.” *Id.*, [0052].

131. In my opinion, a POSA would have understood that both the two-dimensionally detected light intensity in accordance with the three-dimensional pattern of a skin surface—the user’s fingerprint—and the generated fingerprint pattern of Higuchi correspond to the claimed biometric measurement corresponding to a fingerprint. Both these measurements are biometric, correspond to a fingerprint, and are used to authenticate a user.

132. It is also my opinion that a POSA would have been motivated to incorporate Higuchi’s fingerprint input apparatus and authentication method in Garcia’s mobile device because Higuchi expressly teaches and suggests such incorporation for this exact purpose—financial transaction authentication.

Accordingly, a POSA would have been motivated to implement Higuchi's biometric data as a simple substitution for Garcia's password-based user authentication. Section VI.C explains further rationale for combining Higuchi into the Garcia-King-Watanabe combination.

G. Claim 30

133. Claim 30 recites limitations substantially similar to those of independent claim 25 but styled as a method rather than an apparatus. Claim 30 is rendered obvious by the combination of Garcia, King, Watanabe, and Higuchi (Ground 2) for the same reasons as claim 25.

1. [30pre]: A method for allowing a user to deposit a check using the user's computing device, the method comprising:

134. Garcia discloses [30pre].

135. Garcia "refers to 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 place electronically by means of a mobile device capable of capturing and sending images through an internet connection." Garcia, 1:8-14. In my opinion, a POSA would have understood Garcia's mobile device to be the user's computing device because mobile devices were well-known computing devices when the '770 patent was filed. *See* Garcia, 9:20-23 ("[W]herein the user opens a computer application on the mobile telephone."); Ex. 1014 ("Banking via mobile phone is not new.")

2. **[30a]: receiving, by a computer system, a copy of a captured image of a check; and processing, by the computer system, the check for mobile check deposit in a bank and updating a balance of an account based on an amount depicted in the check;**

136. In my opinion, the combinations render obvious [30a] as explained for [25a].

3. **[30b]: wherein the copy of the captured image is transmitted from a user's computing device configured to implement the following method:**

137. In my opinion, the combinations render obvious [30b] as explained for [25b].

4. **[30c]: authenticating a user based on a biometric measurement obtained corresponding to the user;**

138. In my opinion, the combinations render obvious [30c] as explained for [25pre] and [25c].

5. **[30d]: instructing the user to capture an image of a check;**

139. In my opinion, the combinations render obvious [30d] as explained for [25d].

6. **[30e]: using a display screen of the user's computing device to assist the user in capturing the image of the check; and**

140. In my opinion, the combinations render obvious [30e] as explained for [25e].

7. **[30f]: using a wireless network to transmit a copy of the captured image from the user's computing device to the computer system.**

141. In my opinion, the combinations render obvious [30f] as explained for [25f].

VII. CONCLUSION

142. 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 770 Patent to be anticipated by or obvious over the prior art discussed above.

143. 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.

144. 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.

Declaration of Dr. David Doermann

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Dated: August 15, 2023

By: 

David Doermann, Ph.D.